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Leadership and the Negotiation of Order in Small Groups

Les Prince

Thesis for Doctor of Philosophy

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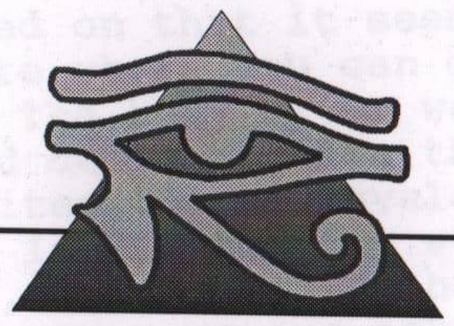

November 26, 1990
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Dear Dr. Prince,

You must think, by now, that the copy of your dissertation, which you so kindly sent to me in early August, has either been lost, or ignored. This is far from the case. I was tremendously impressed by your study, and congratulate you most heartily. I think that probably nobody yet has given the problem such a thorough examination and evaluation as you have.

When I received your manuscript, I sketched through it eagerly, and received the impression that you were probably not only right, at least for the most part, but that it would take a very careful reading to do it justice. Unfortunately, I have still not had time to do the job I would like to do. It is clear that you take a lot of pains with whatever you do. I have some of the same tendencies myself (although I think you may still be ahead of me in that department). Since I was not able to find the time to do you justice within a reasonable period, I lent the thesis to one of my graduate students, who still has it. (It may be that you have a twenty-pound "stopper" here that will hardly let anybody get through it and reply helpfully to you.)

In addition, I have had a number of operations to deal with, and have been grabbing every spare minute to write materials, programs, and the like, that are needed by the consulting group that is now using my work--to great advantage, and to my great satisfaction. I am enclosing two overviews of the SYMLOG System, (one more technical, the other less so) with the hope that they may help to bring you up to date on my present preoccupations if you are interested. There have been so many developments since the hypotheses you worked on that it seems hopeless to try to do more than try to indicate where you can get more information if you wish. I hope that the body of my work will come up to your fine acknowledgement and dedication in the disseration. I think I have indeed been commited to the development of social psychology, and still am. I hope that my work will bear fruit in the academic discipline, as it has in the field of application. Again, I thank you for your generous acknowledgement, and for your own evident dedication to the development of social psychology.

With very best wishes for your future work and contributions.

Sincerely yours,

Robert F. Bales

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LESLIE PETER PRINCE

Doctor of Philosophy

THE UNIVERSITY OF ASTON IN BIRMINGHAM

September 1988

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The University of Aston in Birmingham

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Leslie Peter Prince

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ABSTRACT.

This thesis is focussed on the role differentiation hypothesis as it relates to small groups (Bales, 1958). The hypothesis is systematically examined, both conceptually and empirically, in the light of the Equilibrium Hypothesis (Bales, 1953) and the Negotiated Order Theory of leadership (e.g. Hosking, 1988). Chapter 1 sketches in a context for the research, which was stimulated by attempts during the 60s and 70s to organise small groups without leaders (the leaderless group, based on isocratic principles). Chapter 2 gives a conceptual and developmental overview of Bales' work, concentrating on the Equilibrium Hypothesis. It is argued that Bales' conceptual approach, if developed, can potentially integrate the disparate small groups and leadership literatures. Chapters 3 and 4 examine the concepts "group", "leader" and "leadership" in terms of the Negotiated Order perspective. In chapter 3 it is argued that two aspects of the concept group need to be taken separately into account; physical attributes and social psychological aspects (the metaphysical glue). It is further argued that a collection of people becomes a group only when they begin to establish a shared sense of social order. In chapter 4 it is argued that leadership is best viewed as a process of negotiation between those who influence and those who are influenced, in the context of shared values about means and ends. It is further argued that leadership is the process by which a shared sense of social order is established and maintained, thus linking the concepts "leadership" and "group" in a single formulation. The correspondences with Bales' approach are discussed at the end of the chapter. Chapters 5 to 8 present a detailed critical description and evaluation of the empirical work which claims to show role differentiation or test the hypothesis, both Bales original work and subsequent studies. It is argued here, that the measurement and analytical procedures adopted by Bales and others, in particular the use of simple means as summaries of group structures, are fundamentally flawed, and that role differentiation in relation to particular identifiable groups has not been demonstrated clearly anywhere in the literature. Chapters 9 to 13 present the empirical work conducted for the thesis. 18 small groups are examined systematically for evidence of role differentiation using an approach based on early sociometry (Moreno, 1934). The results suggest that role differentiation, as described by Bales, does not occur as often as is implied in the literature, and not equivocally in any case. In particular structures derived from Liking are typically distributed or weak. This suggests that one of Bales' principal findings, that Liking varies independently of his other main dimensions, is the product of statistical artifact. Chapter 14 presents a general summary of results and presents some considerations about future research.

KEY WORDS: Role Differentiation; Leadership; Group Dynamics; Isocracy; R. F. Bales.

For

Ali, Martha and Tom,

and for my parents

Pat and Ken Prince.

In all humility,

this thesis is also dedicated to

R. F. Bales.

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"... I hope it is no very cynical asperity not to confess obligations where no benefit has been received ..."
Samuel Johnson to Lord Chesterfield.

Although it often felt like it, this thesis, like all such undertakings, was not the product of one person alone. My supervisor, Dr. Dian Hosking has been a constant source of support and help throughout the aeons that seem to have passed between conception and production. To anyone who knows her work, the massive intellectual debt that I owe her will be obvious. To those who don't (and if there were any justice they would be few), Dian's well developed views on leadership, and her formidable capacity for conceptual thought, have helped me to unravel more than one Gordian Knot, and in particular that one dealing with the relationship between the conceptual terms "leader" and "leadership". It was a pity that the solution was not as straightforward as the one adopted by Alexander the Great on the original knot!

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illiteracy to the semi-literate expertise that I now enjoy, and I'm very grateful.

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PROLOGUE.

Among the many problems encountered in the preparation of this thesis was the question of whether to write in the first or third person. This might seem to be a trivial matter, but in fact it is not since on the outcome of that choice rests the whole "effect" of the finished piece. In particular the difference is between a personal document indicating commitment and involvement in the work, or a rather dryer alternative - a "scientifical" piece giving the impression of impartiality and detachment. The latter is, by and large, most appropriate for academic work, but at the same time I wished to make it as clear as possible that the questions tackled within the thesis were not, for me, simply addressed as part of a mere academical exercise - I have from the outset regarded them as of the utmost importance, and in some ways crucial in terms of choices about organising joint human actions in the 'real' world, that mythical area found just outside the social psychological laboratory.

At first I experimented with the first person, but the result was rather egocentric in character, so I decided on a compromise. Chapter 1, the introduction to the whole thesis, is written mainly in the first person, and the rest in the more neutral form most evident in social psychological texts. The aim of chapter 1 is to state as clearly as possible how and why this thesis happened, and since the reasons are largely due to personal experience of, and reflection on, problems arising out of the social, political and cultural context of the late 60s and throughout the 70s, I felt that a <u>personal</u> testament of this sort had to be included somewhere.

The rest of the thesis is a more conventional attempt to answer the questions raised in chapter 1, using the methods and critical approaches that I think are appropriate to a social psychological examination.

Let me state clearly that the reason this is a social psychological text (as opposed to, say, a sociological one) is that I believed at the beginning that social psychology is the only discipline within which to tackle the questions I find most interesting. The reason is simple, social psychology is the only discipline which attempts to derive explanations taking account of both individuals and groups. Having spent several years on the thesis I am now even more firmly convinced that this is true.

CHAPTER 1: ON THE PROBLEM OF LEADERLESSNESS.

1. INTRODUCTION.

> "The ceaseless whisper of the more permanent ideals, the steady tug of truth and justice, give them but time, <u>must</u> warp the world in their direction." (William James, 1911).

The origins of this thesis lie in the social experiments in 'leaderlessness' during the 60s and 70s. The term was a vague one even then, but the aim was clear enough. It was the attempt to establish organisational forms which dispensed with, and made impossible, permanent formal structures and lines of authority. More positively it was a general attempt to create organisational forms which ensured equality of participation and value for all participants.

The broad anti-hierarchical framework of values stimulated attempts to to organise without leadership, or more precisely, without <u>leaders</u>. In its more general form, it was simply a search for alternatives to hierarchy; the search for heterarchies. In its boldest form it was an attempt to establish unalloyed isocracy, or pantisocracy. Although allied to a vision for society at large, the focus of this attempt was the small group which was widely felt to be the ideal unit of social organisation. With varying degrees of emphasis it was suggested that society could, and

should, be composed of small independent leaderless groups of people, engaged in cooperative enterprises for the good of society as a whole (Hare, 1982; Hare & Blumberg, 1968, 1977, 1980). Beyond this it was suggested that such groups could be affiliated with one another in a series of overlapping federal systems (see for example, A.B., 1978; Avrich, 1972, a, b; Chomsky, 1973; Christie, 1978, 1980; Christie & Meltzer, 1970; Gray, 74; Meltzer, 1977; Ward, 1974).

When I embarked on this study I did so with a number of questions derived from my own experience of these experiments. For example it was an interesting, indeed vitally important, question why it was that, even with people committed to heterarchical organisation, and committed to the essential underlying ethics of cooperation, free exchange of information and so on, so many of these groups seemed not to be successful. Why it was that they either developed covert structures of dominance and submission, or simply fell to pieces, or both.

Into my ruminations on these topics the work of Bales and his colleagues intruded (e.g. Bales, 1952, 1953, 1956, 1958; Bales & Slater, 1955; Slater, 1955). I was impressed with the fact that Bales (who, along with Milgram, was the first social psychologist to make an impact on my thinking) seemed to be addressing precisely the kinds of issues that I was interested in. It was therefore Bales' approach which, so to speak, directed my own, and accordingly Bales' work provides the major structuring theme of the thesis.

Conceptually, I was aware that the literatures on leaderlessness appeared to confuse what were, for me, quite distinct categories; leadership and formal position. I have since discovered, of course (and much to my horror) that they were not alone in this, and that many of the authors of the social psychological and sociological literatures on leadership also conflate the two. In my readings of historical texts, however, particularly those dealing with mutiny and relations between officers and other ranks within military settings, I was impressed with just how distinct ideas of leadership and rank really were. It seemed to me then, and even more so now, that 'leadership' involved particular kinds of positive relations and mutual regard. Leadership, as opposed to the mere exercise of authority, seemed to preserve, and be aimed at preserving, the essential dignity of all those involved, and the exercise of influence seemed to be accomplished via some sort of negotiation process, whether tacit or overt. The actors seemed to 'know', somehow, what was expected of them, and also, so it seemed, to be successful all parties had to find the arrangements 'acceptable', in some sense.

My ideas were then fairly vague and intuitive, and it was the work of two authors, in particular, that helped me to structure and tighten them up. Kelvin (1970) was the first work of social psychology that I read which presented a view of leadership that seemed to correspond with the sorts of ideas I had been developing. There is a danger here, of course, of appearing to endorse the book simply because it agreed with my own outlook, and to some extent I suppose that is the case. Nevertheless, Kelvin provided me with something of undoubted intellectual benefit; he gave me a concept

and an approach with which to muster to my ideas - "social order". More than this, however, he made me realise that the ideas themselves were intellectually respectable.

Later I came across the work of my supervisor, Dian Hosking who has developed the negotiated order perspective extensively (see for instance Brown & Hosking, 1984; Hosking, 1988; Hosking et al., 1984; Hosking & Morley, 1983, 1985 a, b; Morley & Hosking, 1984). It was a matter of no small comfort to discover how closely our ideas seemed to correspond. This is not to say that they were identical, of course, and nor is it to claim that the development of the ideas in the intervening years was smooth. On the contrary the development of the ideas to the point that they are at now has been a long and sometimes painful exercise. Nevertheless anyone who is familiar with Dian's work will recognise at once the profound impact that her ideas have had on my own.

So, stimulated by questions arising out of my experience of small groups, armed with a methodology and conceptual position I approached the question of leaderlessness. Issues and problems associated with the concepts 'leadership' and 'group' are addressed in some detail in the chapters following this one. In the remainder of this chapter, therefore, I will fill in some of the detail surrounding leaderlessness, beginning with a briefly sketched historical overview. This I believe to be extremely important, because in too many cases social psychological research <u>appears</u> to be conducted in a vacuum. This is not to suggest that social psychologists are unaware of historical and political context, nor that such factors are regarded as unimportant or irrelevant. Such

a view would be both insulting and inaccurate, particularly in view of some of the more recent developments in the discipline (see for example Hosking, 1988; Hosking & Morley, 1985 b; Morley & Hosking, 1984; Tajfel & Turner, 1979, who argue in favour of what they call a more 'social' social psychology). Nevertheless, in view of what is typically left out of social psychological studies, and the strong 'individualist' bias of many of them (Hewitt, 1979) one sometimes gets the strongest impression that social psychological phenomena are somehow isolated from the rest of human life and endeavour. I am very keen to avoid giving the same impression in this thesis because the issues it addresses are too important to be isolated in this way. Moreover, historical material has substantially informed my thinking on the subject, as has my own direct experience and the context within which I gained it. In addition I also wish to stress that the commitment to heterarchy, that is, opposition to to idea of hierarchy, is part of an old and extensive tradition.

That said, however, it should be pointed out that the historical review is <u>very</u> selective, and really focussed on just two periods. This reflects my own interests rather than a reasoned intellectual division of the material. Nevertheless, on the basis of what is argued in the literatures from which I have drawn the review I believe the selection serves to make my point - namely that notions of leaderlessness and heterarchy have a long history.

Following the historical review, some of the problems that arose in the practical application of heterarchical ideas are described, and a brief explanation of why they might have arisen is offered.

Finally there is a summary of succeeding chapters.

2. LEADERLESSNESS: A SHORT HISTORY OF AN IDEA.

The heyday of the leaderless group was the mid 1970s. In terms of gestation, development and final decay the idea dominated radical and progressive thinking over a period extending roughly from 1968 (and in particular May of that year) up to the early 1980s. It was, as Miller (1984) notes, an important aspect of the 'New Left' and the critique of social and political structures which grew out of that movement. The idea itself, at the time of writing, is not entirely dead (it is, for example, still operative in the "New University Project" based in Birmingham and a similar undertaking based in Glasgow), but it has to be admitted that interest in it seems to have waned substantially. In part the reason for this must be related to perceived and experienced inadequacies in implementation, a point which is addressed later in the chapter.

In latter days the idea of the leaderless group and its vision of a related society, that is of organisation without hierarchy, has been associated first and foremost with the Women's Movement, although echoes of it can be found in the Conservationist and Peace Movements (e.g. Erlich, 1976). As noted earlier, however, it is not a new idea. Indeed it recurs throughout history in one form or another (particularly during times of social upheaval) and has been traced by some scholars at least as far back as ancient China and the Taoism of Lao Tsu (Miller, 1984; Watts, 1975; Woodcock, 1977. See also Feng & English, 1973, 1974).

The idea of organisation without hierarchy is at the well-spring of the democratic ideal, and, as Woodcock (1977) has observed, in one form or another it is to be found in all historical periods.

Of some importance in this respect is the proliferate abundance of radical material stemming from the English Civil Wars (sometimes called the English Revolution) and Interregnum (roughly 1642 to 1660). Woodcock (1977) describes this period as having the most important long-term consequences in terms of political thought, especially to the extent that many of the radical movements combined religious and political dissent. Heterarchical ideas, and the stronger notion of isocracy, can be detected, to varying extents, in the writings and speeches of many of the radical thinkers of the time. This is true for some of the Leveller writings and speeches (see for example, Aylmer, 1975; Brailsford, 1961; Manning, 1978; Morton, 1975; Williams, 1978; Woodhouse, 1986), and particularly true of the Diggers or 'True Levellers' (Hill, 1973, especially "The True Levellers' Standard Advanced" on p 75 of that volume. See also Hill, 1974; Woodcock, 1977). Perhaps its most vivid expression, however, is to be found in the antinomianism of those who were called the Ranters and other, sometimes related, 'extreme' sects such as the Anabaptists, the Fifth Monarchy Men and the Quakers (see for example Denton, 1988; Dow, 1985; Hill, 1974; Hopton, 1987; McGregor & Reay, 1984; Morton, 1979; Smith, 1983; Woodcock, 1962, 1977).

What all of these groups had in common was adherence to the view that all are "equal under God", although admittedly they held to it with widely varying degrees of commitment. This view was succ-

intly summarised in 1685 by Colonel Richard Rumbold (one time Lieutenant under Oliver Cromwell) while he stood on the scaffold awaiting execution for the attempted assassination of Charles II:

> "I am sure there was no man born marked of God above another; for none comes into the world with a saddle on his back, neither any booted and spurred to ride him."

Although couched in language that nowadays would be deemed inappropriately sexist, the basic idea is manifestly the same one that underlay the attempts to organise heterarchically in the 60s and 70s. It is also significant that contemporary Quakers, at least in Britain, have maintained the traditional opposition to hierarchies, and still espouse a commitment to heterarchy (Hare, 1973, 1982; Hare & Blumberg, 1968; Phillips, 1965).

In terms of emphasis and desire, the contemporary critiques of hierarchical society are without doubt a continuation of the same tradition of dissent as that which has been partially described above. It has to be admitted, however, that the correspondences are only now being recognised generally, despite the efforts of historians such as Brailsford (1961), Hill (1974) and Morton (1975, 1979), and political thinkers such as Bernstein (1930) and Woodcock (1962, 1977) - Carlin, (1983), Harper, (1987) and Hopton, (1987) are, for example, outcrops of this new recognition. In the main, however, with the exception of Harper and Hopton, these authors are concerned with correspondences between the historical movements and Marxism. The Alternative Movement, however, growing out of the New Left, was not so much inspired by Marxist as by Anarchist thinking (Apter & Joll, 1971; Goodman, 1968; Miller, 1984, Woodcock, 1962, 1977), and, apart from some aspects of the

early writings of Marx, for example), it is the Anarchist critique of society which leads most directly to attempts to dispense with leaders.

3. THE CHALLENGE TO HIERARCHY.

Some of the ideas contained in the texts cited above are unmistakeably Anarchist in character (Woodcock, 1977). Similar ideas were also very much in evidence during the French Revolution of 1789 (Miller, 1984). Anarchism as such, however, is really a product of the nineteenth century; the term being coined by Proudhon in 1840 (Edwards & Fraser, 1969; Proudhon, 1890; Woodcock, 1977). It was after this date that professed (or as some would have it 'self-confessed') Anarchists were to be found, active particularly in the French Revolution of 1848, the First International of 1864, and especially during the Paris Commune of 1871 (Edwards, 1973; Schulkind, 1972; Woodcock, 1962, 1977). It was during this period that many of the ideas now labelled Anarchist were developed.

To speak of Anarchism is to some extent misleading. More properly one should refer to anarchisms since there are several schools of thought nestling under the generic term (Miller, 1984; Walter, 1969). For example, on one extreme are the radical individualists such as the Stirnerite 'Egoists' (see for example, Clark, 1976), and at the other various kinds of collectivists and communists such as Bakunin (Dolgoff, 1971; Lehning, 1973), Berkman (Berkman, 1929), and Goldman (Goldman, 1917). There are revolutionary strains, exemplified by Bakunin, and more recently Christie (Christie, 1980; Christie and Meltzer, 1970. See also, Paz, 1976;

Tellez, 1972), and also very strong pacifist traditions such as that of Tolstoy (Tolstoy, 1909, 1948).

To the opponents of anarchism (and there are many), this sort of variety only confirms the widespread (and erroneous) view that anarchism has no coherence. But that is because they are looking for a single theory, whereas, as Alex Comfort notes in his introduction to (Barclay, 1982), anarchism is as much a way of living as it is an ideology. That is, Anarchism is as much an ethical orientation as it is a political one (Read, 1974). Indeed anarchists by and large stress the ethical aspects, particularly by emphasising the unity of means and ends, which is the insistence that the means adopted for the achievement of particular ends must be ethically consistent with those ends (see, for example, Bookchin, 1971; Carter, 1971; Malatesta, 1891; Read, 1974; Richards, 1965; Walter, 1969; Woodcock, 1962, 1977, and, especially, Kropotkin, 1924).

The experiential aspect of Anarchism, however, although important, should not be over stressed. As Miller (1984) notes in his preface, over emphasis of such factors:

> "... seems to me to run the risk of devaluing Anarchism as a purportedly consistent and realistic set of beliefs about man [sic] and society, and regarding it instead as an indefinable experience, rather like the taste of pineapple to those who have never eaten the fruit."

Nevertheless it is within the ethical framework that Anarchists find common ground. All varieties of anarchism share a vital commitment to, and belief in, the freedom and dignity of the whole of humanity. As Berkman (1929) puts it:

> "... Anarchism is not ... bombs, disorder, or chaos. It is not robbery and murder. It is not a war of each against all. It is not a return to barbarism or to the wild state of man. Anarchism is the very opposite of all that.
>
> Anarchism means that you should be free; that no one should enslave you, boss you, rob you, or impose upon you. It means that you should be free to do the things you want to do; and that you should not be compelled to do what you don't want to do. It means that you should have a chance to choose the kind of a life you want to live, and live it without anybody interfering. It means that the next fellow should have the same freedom as you, that everyone should have the same rights and liberties. ... That is to say, that there should be no war, no violence used by one set of men against another, no monopoly and no poverty, no oppression, no taking advantage of your fellow-man. In short, Anarchism means a condition of society where all men and women are free, and where all enjoy equally the benefits of an ordered and sensible life." (Berkman, 1929: xxvi - xxvii).

More succinctly, the same idea was expressed by a slogan of the 70s: "Neither Master Nor Slave!", or as Proudhon put it:

> "Whoever puts his hand on me to govern me is an usurper and a tyrant; I declare him my enemy." (In Woodcock, 1977: 9 & 166).

Given this sort of position it is not surprising that anarchists should be suspicious of all forms of governance, including those forms which manifest in what might be called 'personal leadership'. Indeed, as the name anarchism suggests it is an orientation towards society without government; an-archy. It would be a mistake, however, to assume that anarchists were, or are opposed to any kind of social order. On the contrary, as the quotation from Berkman suggests, the sort of society that anarchists envisage is an orderly one, but one that reduces or negates the effects of social, political and fiscal power and maximises human choice.

Anarchism is not so much opposed to power, or influence, as such, but to the inevitable abuse of power, and the capriciousness of those who hold power. That is to say, anarchists are sceptical of the motives of those who either have or desire power, and are absolutely opposed to the idea and practice of power without accountability. More positively anarchists envisage a society in which 'savants', to borrow Bakunin's term, representatives, and representative bodies are all directly accountable to their constituents (Avrich, 1972, a & b; Bookchin, 1971; Ward, 1974). As Bakunin put it:

> "Does it follow that I reject all authority? Far from me such a thought. In the matter of boots, I defer to the authority of the bootmaker; concerning houses, canals or railroads, I consult the architect or the engineer. For such specialist knowledge I apply to such a 'savant'. But I allow neither the bootmaker nor the architect nor the 'savant' to impose his authority on me ... I recognise no infallible authority, even in special questions; ... I bow before the authority of specialists because it is imposed upon me by my own reason. I am conscious of my inability to grasp any large portion of human knowledge in all its detail and developments. The greatest intelligence would not be equal to a comprehension of the whole, whence the necessity of the division and association of labour. I receive and I give; such is human life. Each directs and is directed in his turn. Therefore there is no fixed and constant authority, but a continual fluctuation of mutual, temporary, and above all voluntary authority and subordination." (Bakunin, in Dolgoff, 1971: 229 - 230. Also, Bakunin, 1916: 32 - 33; Woodcock, 1977: 312 - 313).

This is a long quotation, but in many ways it is a remarkable passage, and could well serve as a key-note to the whole thesis. Had Bakunin been writing a social scientific study of organisation, instead of a political polemic, then it could appropriately have been described as prescient. There are elements of this passage, for example, which have very clear correspondences to

such recent ideas in organisational behaviour as "multistructured functioning" (Herbst, 1976) - which is not surprising since Herbst was concerned with non-hierarchical organisation - and more surprisingly to the so-called "matrix structure" which is described in the organisational behaviour literature (see Galbraith, 1971; Gordon, 1987; Handy, 1985; Harrison, 1972).

Of more interest in terms of the thesis, however, are the close affinities, particularly at the end of the quotation, with the **negotiated order** approach to leadership, especially in the emphasis on choice, and acceptability of influence attempts. In this respect Bakunin anticipates the work of theorists such as Gibb (1947, 1969), Hollander (1958, 1964, 1974), Hosking (1988), and so on, particularly in his assertion that influence is a matter of interdependence between the person influenced and the one influencing (see chapter 4 below). This is all the more remarkable when it is considered that "God and the State", from which the quotation is drawn, was written in 1871, on the eve of the Paris commune, although its first published edition (in French) didn't appear until 1882.

It is noteworthy that Bakunin recognises the pervasiveness and **to some extent** the legitimacy of, in the typology of French and Raven (1959), "expert" power (and perhaps informational power also). In this he anticipates much of the Foulcaldian tradition of social thought (see, for example, Rabinow, 1984). Significantly, however, he utterly repudiates what French and Raven would call "coercive power", as well as that of "personal" or "charismatic" power. This is brought most forcefully home in a passage which Avrich, in his

introduction to "God and the State", describes as "withering", and in which Bakunin attacks:

> "... all the tormentors, all the oppressors, and all the exploiters of humanity - priests, monarchs, statesmen, soldiers, public and private financiers, officials of all sorts, policemen, gendarmes, jailers and executioners, monopolists, economists, politicians of all shades, down to the smallest vendor of sweetmeats." (Avrich, Introduction to Bakunin, 1916: vii).

It must be stressed that although Bakunin was attempting to articulate a coherent social critique, and to present a vision of the future society, he was not therefore trying to construct a system as he calls it. Indeed he specifically repudiates system builders, and rejects the "scientific" socialism of the Marxists; his own socialism, he asserted, was "purely instinctive" (Avrich, in the introduction to Bakunin, 1916: vi). This sort of view, as mentioned earlier, has contemporary echoes in what de Reybekill (1977) calls "the politics of ecstacy", the combining of emotional as well as rational aspects in political thinking (see also Gray, 1974; Read, 1974). This sort of stance was common, to varying extents, with all of the major anarchist writers.

Thus, to try and summarise the main points of anarchist thought. In terms of social critique anarchists were, and are, opposed to governance of all forms. In this context governance is taken to be forms of organisation, and techniques of organising, which specifically seek to restrict, ignore or deny human action and choice. In particular anarchism is opposed to all forms of organisation which overlook the essential humanness of those organised, and which regard and treat dissension and disagreement not as legitimate human processes but as "pathological trouble-making", or

similarly pejorative evaluations. In short, anarchists insist that organisations, and, as Hosking (1988) has recently described it, organising processes (see chapter 4 below), should be responsive to the needs, values and aspirations of those organised or organising, and not just those of the people with power.

Anarchism is thus opposed to any suggestion that mere labels (such as "leader") should entitle the holders to any special privileges or respect simply in virtue of holding the label. Formalised coercive power and status structures which tend to perpetuate themselves are obviously anathema in this sort of ethical framework, and thus anarchists tend to shy away from allowing anyone to create structures which appear to approximate them. Following from this there is also general distrust of what came to be called "the cult of the expert" (see the Bakunin quote given earlier, and the comments following). When everyone is regarded as having equal rights to contribute to any debate or practical undertaking, expertise is obviously only one kind of input, and not to be regarded as more important than any other. The reason for this is clear, expertise, while enabling groups to achieve what they might otherwise not have achieved, can, as Foucault and Bakunin before him have argued, also be used as a source of considerable social power, and can therefore be used as a "weapon" in the armoury of social control (see Bakunin, 1916; Debord, 1977; Dolgoff, 1971; French & Raven, 1959; Gray, 1974; Rabinow, 1984; Woodcock, 1977). More than any other political movement anarchism has been acutely aware of the potentially negative power of expertise. Anarchists therefore generally treat it with distrust, and try to minimise its effects. This, to a very great extent, underlay most of the

difficulties experienced in heterarchical experimentation, a point which will be addressed later.

More positively anarchism presents a vision of society in which all work both for themselves and for the greater good of the whole, whilst allowing each other maximum freedom of action and choice. For anarchists, even many of the individualists, the individual and the social collective are equally important, and are inextricably bound together. It might be remarked in this context that the emphasis on both the individual and the collective is what marks out anarchism from right wing libertarianism. It might also be remarked that this dual emphasis also renders social psychological analyses of anarchist organisations particularly appropriate.

Thus the distinctive aspect of anarchist organisation is the attempt to organise in such a way that the opportunities for negative, capricious and oppressive uses of power are diminished to a vanishingly small degree, and the opportunities for individual and collective choice and creativity are enhanced. This, at bottom a very simple idea, is the organisational ethic which characterised groups and organisations of the New Left and Alternative Movements.

4. ANARCHIST IDEAS IN THE 60s AND 70s.

The claim that Anarchism underlay much of what was attempted in the 60s and 70s, is not made lightly; much of the literature of the period does not make explicit mention of the foundations for the ideas they contain. Moreover, there were other sources of

influence such as the Eastern mystical religions, the Western Magical Tradition, Maoism, and so on. Indeed it is also worth remarking that the 60s and 70s saw the revival of a folk tradition in music and literature, and thus the period is characterised to some extent by a mixture of backward looking nostalgia and forward looking "progressivism". Nevertheless, the influence of Anarchist ideas is evident throughout the period in the initiatives and aspirations of New Left and Alternative Movement groups, particularly in initiatives such as the Co-operatives Movement and the attempts to establish "free schools", "alternative colleges" and so on (see, for example, Abbs & Carey, 1977; Carter, 1978; ITM, various issues; Saunders, 1975; Ward, 1987). This is especially clear when one considers the general distrust of "leaders", would-be "leaders, "experts", and so on, and the general emphasis on consensus decision-making (Paton, 1978, Treanor, 1977). Moreover, any examination of the ephemeral literatures of the period reveals unmistakeably anarchist influence (see, for instance, News From Neasden, various issues; Smith, 1977). The titles of many of the magazines and journals are themselves illuminating in this respect: "Libertarian Education" and "Black Dwarf", for example. Finally, on this note, it is worth remarking that the 60s and 70s saw an almost unprecedented flourishing of the avowedly anarchist press; "Freedom" (founded by Kropotkin last century) became a weekly, "Anarchy" (1st and 2nd series) became near monthlies, and other magazines abounded (for example, "Black Flag", the "Cienfuegos Press Anarchist Review", "International Times", "Open Road", "Zero", and so on).

Historically, what seems to have happened is that the writings of the main anarchist thinkers had been lost. This was for two main reasons. First there was deliberate repression on the part of the authorities (throughout the western world at least) particularly after the Paris Commune, and second a general neglect of anything labelled "anarchist" by the left - after all, authoritarians of all shades of opinion had a vested interest in suppressing the major anarchist critique (Apter & Joll, 1971; Edwards, 1973; Miller, 1984; Schulkind, 1972).

Apart from a brief flourishing of activity during the First and Second World Wars (the first of which, incidentally, split the movement) anarchism remained quiescent until the late 1950s (Apter & Joll, 1971; Quail, 1978). The revival was heralded by the founding of CND and the Committee of One Hundred, the Aldermaston marches, and more widely by the general unrest generated and focussed by the opposition to the Vietnam War (Apter & Joll, 1971; Quail, 1978). From this period the anarchist writers were "rediscovered" by the New Left (Apter & Joll, 1971; Gombin, 1978; Miller, 1984), and there followed, amongst other things, a furious republishing of the classical texts. Given that the publishers of these texts were, in the main, ordinary commercial concerns (as opposed to committed anarchist publishers such as the Cienfuegos Press and the Freedom Press), one can take this latter activity as a clear indication of the importance of, and interest taken in, anarchist ideas during this period. In any event, whether anarchism was the <u>major</u> influence of the period or not, what is of interest here is that it was an <u>important</u> influence, and that considerable numbers of groups and individuals, even those who

were not themselves anarchists, attempted to implement ideas which were clearly anarchist in origin and spirit. That is to say, there were widespread attempts to discover heterarchical forms and to implement the isocratic ideal.

5. PRACTICAL HETERARCHY.

The isocratic ideal, that is, the attempt to organise without leaders, although simple in principle, turned out to be difficult in practice. As noted earlier, one of three things seemed to occur in groups organising themselves heterarchically: some of the groups developed covert hierarchies; some simply fell to pieces very rapidly; and others, by a succession of stages, seemed to do both. Moreover, many of them remained or became inactive, degenerating into a sort of debating society which never got around to <u>doing</u> anything. Inevitably membership turnover tended to be high, and levels of satisfaction tended to be low.

The obvious question which arises is why? There are, of course, many equally obvious answers, most of which revolve around the rather facile suggestion that somehow people aren't ready for or capable of organising without "someone in charge"; that it is not "in human nature" (see Meltzer, 1977, 1981; Kedward, 1971; Walter, 1969). But like any monocausal explanation of human behaviour, this one over-simplifies to an extent that makes it impossible to take it seriously; as Brown (1954) has observed what is or is not thought to be "in human nature" varies with the social, political and cultural contexts within which people live and work. Nevertheless, the "human nature" thesis is related to a more widely held belief in what might be called the inevitability of hierarchy, or,

as Michels (1959) called it, the "iron law of oligarchy".

By the inevitability thesis it follows that a group will, first of all, "naturally" develop a hierarchy, or, second, if it fails to do so will inevitably disintegrate. That is to say, this thesis not only asserts the inevitability of hierarchy, it simultaneously asserts its desirability. As Popper (1966) has observed, however, the very belief in such a proposition may be instrumental in bringing the situation about; it may, in short, be a self fulfilling prophecy. By the same token, a belief in the non-inevitabilty of hierarchy, and a commitment to the view that hierarchies are undesirable, may ultimately bring about the reality of isocratic heterarchies. In this context it is as well to be reminded that for the most part those who attempted to implement non-hierarchical forms of organisation were committed to them as desirable ends in themselves. Nevertheless, as experience has shown, beliefs and desires are alone not sufficient to bring about any general state of affairs; the question still remains as to why these groups seemed not to be successful.

There are good reasons why heterarchies are difficult to establish, social reasons which do not require reference to nebulous and contentious concepts such as human nature. Before examining some of these, however, it is as well to point out that heterarchies, in some form, are not "impossible". That is to say, **there is evidence that what might be called "approximate" or "practical" heterarchies, as opposed to "pure" isocratic heterarchies, (or pure anarchism) can operate successfully**, in the sense that some measure of equality can be maintained, work can be accomplished,

and the organisation can survive for more than just a brief period.

During the Spanish Civil War (1936 - 1939) there was considerable expropriation and collectivisation within the republican areas, prompted mainly by the anarcho-syndicalist Confederacion Nacional de Trabajo (C.N.T) and its "ideological" wing the Federacion Anarquista Iberica (F.A.I). Overall it seems that there was something in the order of one thousand collectives in all, involved in a highly varied set of undertakings, including agrarian and industrial collectives (Chomsky, 1977; Dolgoff, 1974; Leval, 1975; Meltzer, 1978; Miller, 1984; Paz, 1976; Richards, 1972). It has been estimated, for example, that at one point more than three quarters of the land in Aragon was managed collectively (Miller, 1984: 161), and in Barcelona collectivisation "embraced all forms of transport, the major utilities, the telephone service, the health service, the textile and metal industries, much of the food industry, and many thousands of smaller enterprises" (Miller, 1984: 165. See also Chomsky, 1977; Dolgoff, 1974; Leval, 1975; Orwell, 1938).

These collectives, it has to be admitted, didn't always run as smoothly as they might have. In particular there were difficulties of co-ordination between collectives, and supply of goods was sometimes a problem (Dolgoff, 1974; Leval, 1975; Miller, 1984). Moreover, it has been claimed that the experiment lasted for barely a year (Miller, 1984), although this is only true of the large scale collectivisation, because some of the smaller collectives, particularly in remote regions, managed to survive even

after the victory of Franco, and perhaps longer. It is also worth bearing in mind that these collectives were set up in the exceptional circumstances of the civil war, and in the face of considerable hostility from the socialist and communist authorities (Dolgoff, 1974; Leval, 1975; Miller, 1984). Nevertheless, some of the collectives were remarkably successful; in particular the collectivised transport system of Barcelona has attracted considerable praise, from anarchists and non-anarchists alike (Borkenau, 1938; Orwell, 1938). Miller, who is not himself an anarchist, states:

> "If we were to draw up a final balance sheet on the evidence we have examined, there would be several entries on the credit side. To begin with, we should have to include the personal fulfillment felt by many participants both in the communities and the collectives ... We should also want to include the evidence that these experiments provide about human creativity: they show that people can take on quite new tasks and fulfill them with distinction - that, indeed, conventional society makes much less than full use of of its members' potential. Third, the evidence bears out the anarcho-communist claim that people do not require individual incentives in order to carry out their share of society's work ... Finally, the collectives in particular show that industrial democracy of quite a radical kind is not a pipedream, given the appropriate background conditions." (Miller, 1984: 167).

It is also worth pointing out in this context that the C.N.T was, before the civil war, the largest of the Spanish trade unions, and is rapidly becoming so again now that the official suppression has been lifted (Christie, in press). Moreover, although bureacratic in some respects, it is a significant fact that from 1931 to 1936 at least, there was only one full time official "for an organisation of up to one million people" (Mintz, 1977: 38).

A more recent example of anarchist organisation at work is the Christiania Freetown, located in a converted army barracks on the outskirts of Copenhagen. It was founded in 1969 by a group of activists called the "Slumstormers", and despite official attempts to have it closed down has managed to survive until the present day, which is no mean feat given the prodigious death rate of such experiments. Christiania has been the subject of several academic studies, most of which conclude that the social experiments being conducted within the Freetown seem to be working successfully in some measure (Blum, 1977).

One aspect of the organisation of Christiania is the non-violent "Rainbow Army", which was formed for the defence of the town. An interesting feature of this army is that it is organised around different functional roles, reflected in the eight colours of its flag:

> "Red: Large scale construction, practical constructors, physically hard work.
>
> Orange: Vison propaganda, theatre, music, posters, painting, film, photography.
>
> Yellow: Child-minding, mouth-to-mouth messengers, initiators.
>
> Green: The green supply line, baker's shop, eating-houses, shops, pubs, kitchen gardens.
>
> Blue: Poets, pushers, creators of dreams and nic experiences.
>
> Violet: Chiefs, kings and queens who do the cleaning and rubbish collecting (the greatest are everybody's servants).
>
> White: Physical and spiritual healers, first-aid.
>
> Black: Maintainers of order - those who can prevent violence without aggression. Samurais and Karate and other martial arts masters."
>
> (The Support Christiania Group, 1977: 6).

It is instructive when reading this list to consider the long quotation from Bakunin given earlier. Amongst other things it is interesting to note the functions denoted by Black, those of keeping order without aggression. This serves to illustrate very well the point made earlier, that anarchists are not opposed to order, but to organisational forms which seek to restrict human choice. The members of the Rainbow Army chose which of the functional roles they would take, and many wore ribbons (to denote their choices) of several colours.

The fact that Christiania has survived for so long is, considered alone, impressive in view of the fact, noted earlier, that many such experiments failed soon after inception. From more recent personal reports, however, it appears that the Freetown has lost its vigour, and is on the point of dissolution, precipitated, so it seems, by renewed efforts on the part of the Copenhagen authorities to close it down. Nevertheless, for present purposes this is less important than the fact that Christiania furnishes yet further evidence that heterarchies can work, to some extent, and that isocracy is not necessarily an entirely impractical ideal.

Thus, although the evidence is not unequivocal, and is indeed open to interpretion, particularly in the Spanish examples (Miller, 1984), it is clear that heterarchical organisation inspired by the isocratic ideal is not, in Miller's phrase, a pipedream. The failure of the Spanish collectives, which is well documented (Chomsky, 1977; Leval, 1975), can be put down not so much to "innate human inability" as to deliberate sabotage and suppression by those who, for their own reasons, wanted to see the experiment

in independent collectives fail (Chomsky, 1977; Orwell, 1938), and the Christiania experiment has yet to come to an end after nearly 20 years.

6. THE PROBLEMS OF LEADERLESSNESS.

The barriers to pure isocratic heterarchy lie not so much in human inability, as in social processes. Freeman (1970), in her aptly titled "The tyranny of structurelessness", has described with some precision some of the social barriers that stand in the way, as have other commentators such as Hanisch (1970, 1978), Bunch (1974), and Bunch and Fisher (1976). Equally, the ideological objections, many of which can be anticipated from the discussions given earlier, have been delivered with similar vigour by Levine (1974) in her reply to Freeman, and others such as Anna et al (1976), Erlich (1976, 1977), Farrow (1974), Kornegger (1975) and Leighton (1974).

The arguments about the possibility or impossibility, and the desirability, of leaderlessness, centre principally around two sets of issues. First those concerning the emergence of structures of dominance and submission within groups, and second issues relating to the need to structure in order to achieve anything. Among the opponents of leaderlessness Freeman in particular points out that when people enter social situations, especially small groups, **they do not do so equally** (see also Berger, Cohen & Zelditch, 1972; Fisek & Ofshe, 1970). As individuals each person has a unique life history which is reflected in the skills, knowledge and experience that they bring to the group. These unequal life experiences could, of course, constitute an advantage for the

group in terms of the range of skills and varying points of view which could be mobilised on behalf of the group. But in terms of the attempt to establish purely isocratic structures they are obviously a problem since **difference is seldom acknowledged without evaluation**. Moreover, variance in life experiences includes and implies differential experience of education, broadly conceived, kind and quality of occupation, and so on. These in turn have implications for a person's self concept, degree of confidence, degree of articulateness and so on. Thus, as Freeman argues, there are structuring factors already embedded in the social situation of the group itself (Freeman, 1970; Fisek & Ofshe, 1970). That is to say the social situation which is the small group, whatever the principal values of those who compose the group, already, as it were, contains structuring factors which either are immediately apparent, or become so once interaction gets under way (Freeman, 1970; Fisek & Ofshe, 1970; Hanisch, 1970, 1978). Add to these other factors such as those that Bales (1958) has referred to as the "economic" factors of group life, that is time constraint and so on, and it becomes obvious that the scene is set for differentiation between group members in terms of quality and quantity of input to the group's activities, and therefore differentiation in terms of perceived value to the group.

All of this could have been adduced a priori, and indeed differentiation of members be fairly confidently predicted on the basis of what has been discovered about small group interactions in the social scientific literatures (see for example Bass, 1949; Hare, 1976). Thus Freeman's arguments amount to an indictment of the naivete of those who believed, as many did, that simply wanting

absolute equality would generate it (Brown & Hosking, 1984). As she pointed out, a strongly held principle of equality within which attempts to organise and differentiate group members in the service of group action were interpreted as attempts to dominate or to achieve leader status, would first of all restict the scope of action that a group could take, and second, would nevertheless present opportunities for what she called tyranny. That is to say, a strong commitment to purely isocratic heterarchy, which left no room for compromise, would prevent the group from taking action and would also stimulate covert dominance structures. The latter effect would occur in such situations, she argued, because members motivated by pure isocracy would either not "see" dominance when it occurred, having convinced themselves that the group was equalitarian, or, if they did notice it would "keep it quiet" for fear of upsetting the group.

Freeman's predictions turned out to be accurate; the effects which she predicted were among those noted earlier as the kind of problems which did occur in heterarchical groups. Freeman's point was that structures which differentiated group members should be made explicit, so that they could be controlled by the group and its members. In itself this is not necessarily a bad point, but as her critics point out, her position, in their terms, is dangerously close to an abandonment of the search for heterarchies itself (Erlich, 1977; Levine, 1974; Kornegger, 1975). They claim, with some justification, that Freeman seems to envisage a form of bureacratic hierarchy of the sort favoured by the more traditional left, and it is worth pointing out that many of these groups began with an explicit rejection of such structures (Levine, 1974). They

also point out, again with some justification, that explicit structures of this kind would tend to become reified, and that far from being under the control of the group, would tend to slip out of control. On both sides of the debate the arguments are very reminiscent of those offered by Michels (1959).

There is much to find sympathy with in both sets of arguments, and it is significant that protagonists are aware of, and to some extent show sympathy with, the arguments of their opponents. Indeed, as Erlich (1976, 1977) points out the solutions offered by the opponents of leaderlessness, to use the looser term, are often the same ones proposed by the proponents of it, in particular ideas such as the rotation of leadership. But the arguments, in the final analysis, are unsatisfactory because they cannot be resolved. In the end the debate becomes an ideological one, and the ground shifts substantially from issues about what is or is not adaptive in terms of group action whilst maintaining the main ethic of equality. Ideological arguments of this kind are seldom if ever resolved because they reside not so much in evidence and argument as in conviction of a kind closely akin to religious conviction. And, as a Situationist slogan put it, "Convictions make Convicts of us all" (Gray, 1974).

One thing is very clear, and that is that throughout these debates there is a fundamental confusion as to what leadership is. All of the protagonists agree that some kind of organisation is necessary for groups to achieve anything, but by and large this is interpreted by both sides in terms of appointed, specified, or at least identifiable, leaders. The real difference between the camps is

whether they are prepared to accept leaders of this kind or not. But the issue is not so simple. To anticipate the conclusions of later chapters a little, both sides seem to agree that groups need what we will later call leadership; where they disagree is whether groups need leaders or not. This is by no means a trivial point; as anyone who is familiar with the small groups and leadership literatures will realise, the precise relationship between these two terms is by no means clear cut, and can indeed be the cause of much confusion. It is hardly surprising, therefore, that the debate on leaderlessness should be suffused with confusions about what precisely is the way out of the impasse caused by the realisation that pure isocratic heterarchy, leaderless organisation, is not easy to achieve, perhaps not even possible.

It is, I think, important to note that much of the confusion was caused by the term "leaderlessness" itself; in many ways the issue is not leaderless organisation, but organisation which gives equal value to all the members of a group. This does not necessarily imply absence of leadership. The term "heterarchy", which has been used throughout the chapter as a synonym for leaderlessness, and alternatives to hierarchy, can equally suggest something rather different; something closer to Bakunin's view of rotated or distributed leadership. In other words, heterarchy can suggest not only absence of leadership, but also leadership contributed by everyone. As such it is a better term, but also, in that it is closely related to Gibb's concept of distributed leadership (Gibb, 1969) it allows a link to be made with at least a part of the leadership literature within social psychology.

7. SOME QUESTIONS.

In considering these debates, and in comparing them with groups in which I participated, a number of relatively straightforward questions began to emerge. For convenience some of these will be summarised as a simple list.

1) What does it mean to say that someone is a leader?

2) What is leadership, and how does it relate to the concept "leader"?

3) Is there one kind of structure which typically emerges in small groups, and if so is it necessarily a simple hierarchy?

4) Regardless of what kind of structure typically emerges, is there a structure which is, in some sense, best for small groups?

5) What is a small group any way?

There were, and are, many other questions which could be asked about small groups, but those listed above capture fairly accurately those which I felt compelled to ask when struggling with the implications of the problems of heterarchical organising. Some of them are familiar ones within the leadership and small groups literatures, although none of them has been resolved uncontentiously (see Gibb, 1981; Hare, 1962, 1976; Stogdill, 1974). It will also be noted that the questions about group structure open a challenge to the inevitability of hierarchy thesis mentioned earlier, and open the way for an examination of the main concepts in relation to Bales propositions about role differentiation (e.g. Bales & Slater, 1955) and Gibb's concept of distributed leadership (e.g. Gibb, 1969). Questions 3 and 4 ask two rather different things; first is the question of what kind of structure does typically emerge, and second what kind of structure is best. This

is the distinction between "is" statements and "ought" statements familiar to philosophers (see for example Flew, 1979, on Hume). Obvious though this is, the distinction is frequently either overlooked or compounded in the social scientific literatures with much resulting confusion (Margolis, 1982). It will be returned to several times in the thesis.

These, then, were the questions that stimulated the research that forms the substantive material of the thesis. For the purposes of the thesis, however, groups in general, rather than those which are focussed primarily on isocratic forms, will be examined for structural emergence. So the primary question will be "what sort of structure, if any, typically emerges in small groups?".

8. FINAL INTRODUCTORY NOTES.

This, then, is the background to the thesis. The aim, which in retrospect now appears to be arrogant in its naivete, was to 'tidy up the literature', mainly conceptually, and then to conduct empirical work to test some of the ideas. Naturally things didn't turn out to be so tidy; to paraphrase Hodges (1983: 85), as in the Looking-Glass Garden, the approach towards the heart of leadership within groups led away into a forest of tangled technicalities and conceptual confusions.

Someone once said of metaphysics that it was an unusually stubborn attempt to think clearly, and by this definition I have, in this thesis, tried to be a good metaphysician.

The remainder of the thesis is divided into four parts: conceptual

background; empirical background; method and results; and conclusions.

Part one consists of three chapters which address in turn first the development and conceptual underpinnings of Bales' work; second the concept "group"; and third the related concepts "leader" and "leadership". This part develops a basis for the empirical work later in the thesis in terms of the negotiated order approach to leadership. It is argued that Bales, first of all, has developed a sophisticated view of the relationship between groups and leadership in terms of the "equilibrium hypothesis". The role differentiation hypothesis, which is related to the concept of equilibrium, is argued to be a version of Gibb's distributed leadership concept. It is pointed out that for Bales leadership is accomplished through the joint contributions of what he calls the task and social specialists, and that therefore leadership does not necessarily imply a simple hierarchy. Thus it is suggested that Bales' approach is consistent with a negotiated order approach. Next it is argued that a "group", as opposed to an aggregate of people, is characterised by intersubjective understandings of social order, and this leads into the chapter on leadership. In this chapter it is argued that, first, the concepts "leader" and "leadership" must be distinguished and discussed seperately. Leadership, it is suggested, is an interpersonal process characterised, amongst other things, by positive interdependence in which acceptable influence is achieved to harness and direct joint action. It is also argued that leadership is best conceived in terms of contributions to social order within the group, that is to the construction of a group level "reality", and thus leader-

ship is the process by which a collection of individuals becomes a group, and stays and achieves as a group.

Part two consists of four chapters. The first is a detailed description of the empirical base which Bales claims as evidence of role differentiation. The next two chapters present a detailed and systematic critique of this empirical base. It is shown, point for point, that there are serious problems with the work that Bales reports, at all levels of method, measurement and interpretation of results. The conclusion to this chapter is that Bales does not offer sufficient support for the role differentiation hypothesis. The critique of Bales' work is followed by a similarly critical review of further studies of role differentiation reported in the literature. It is concluded that most of these further studies suffer from similar problems to those described in relation to Bales' original work, although a number of interesting modifications to method are noted. The overall conclusion to this part of the thesis is that the role differentiation hypothesis has never adequately been tested, and that nowhere in the literature is there any evidence that role differentiation ever occurs in any identified, or identifiable, groups. It is further suggested that the methods typically used to examine role differentiation are invalid because fundamentally flawed, and are therefore incapable of giving reliable information about emergent structures within groups.

Part three presents the empirical work conducted for the thesis. The first chapter presents an overview of the research programme, and gives a brief description of some of the problems encountered.

There is also a presentation of an analytical approach based on basic sociometric techniques, in particular the sociogram which is employed in the analysis of the data. The following four chapters present a systematic analysis, one group at a time, of 18 small face-to-face groups from which data were gathered. The results show that small groups develop a number of structural forms, some focussed and some distributed. In only seven cases, however, is there any evidence of role differentiation in Bales' terms, and in none of these is the evidence very good. The implications of these results are discussed in relation to the role differentiation hypothesis, and it is suggested that future research on role differentiation should take a more clinical approach than that typically adopted.

The final part, and final chapter, presents summary conclusions for the thesis, and some considerations for future research.

PART 1: CONCEPTUAL BACKGROUND.

CHAPTER 2: BALES: THEORETICAL BACKGROUND AND DEVELOPMENT.

1. INTRODUCTION.

This thesis has been driven to a very great extent by the work of R. F. Bales and his colleagues on the dynamics of small groups. Specifically it has developed around the set of propositions about role differentiation in small groups which grew out of his empirical work in the fifties.

It has already been explained in chapter 1 that experience and observation of some of the social experiments in 'leaderless' organisation during the nineteen seventies is what generated a general interest in questions associated with leadership in small groups, especially the emergence of leadership structures. When first encountered Bales seemed to be reporting empirical results and presenting attendant methodologies which promised answers to some of the questions raised by those attempts to organise heterarchically. Greater familiarity, and a more critical appraisal, however, suggest that there are considerable problems with the conceptual and empirical aspects of Bales' work, and indeed with his presentation of ideas. Much of the thesis will be concerned with tackling some of these problems. Nevertheless, it must also be emphasised that Bales is here regarded as one of the most perceptive thinkers working on the problems of the psychology of

groups. Certainly he is one of the few workers in the field systematically to study group processes and emergent group structures over time. Furthermore, many of his insights anticipate much later thinking, for example, Hosking's important distinction between 'organisation' and 'organising' (e.g. Hosking, 1988), was anticipated by Bales as long ago as 1950, although it has remained dormant and largely ignored since. Thus it must be emphasised that although what follows will at times be extremely critical of Bales' work, nevertheless it is inspired by a genuine admiration.

The advantages of Bales' approach to small groups include the not inconsiderable attempt to unify discussions of individuals and groups. Bales has consistently attempted to present frameworks which use the same language to describe all levels of analysis (Bales et al., 1979: 13). With hindsight it is not surprising that some areas of such a project remain problematic since, as he admits himself in later work, to be successful it would require nothing less than the complete integration of the whole social scientific enterprise (Bales, 1983; Bales et al., 1979: 11 - 18). Needless to say, whatever the original, naively arrogant, intentions which inspired the thesis, there will be no attempt to complete the integration here; what better and more experienced workers have failed to achieve is too much to expect from a thesis.

The thesis, then, is concerned with the development of leadership structures within small groups, and since the original social psychological inspiration was the work of Bales, it is apposite to begin with a general description of his work.

This chapter is the first of four that will be devoted to Bales' work. Here the emphasis will be on historical development and theoretical underpinnings. The purpose of this chapter is to set the scene for the chapters following immediately which address conceptual issues related to the concepts of 'group' and 'leadership'. The next section describes fairly briefly the phases which are evident in Bales' writings, and identifies the major themes which run through his work. Following this is a description of IPA, and of the major theoretical approach adopted by Bales in terms of the functional problems facing groups, understood in relation to the Equilibrium Hypothesis. It is this hypothesis which constitutes Bales' principal theory of group dynamics, and which places him firmly amongst the systems theorists (see Wilson, 1978). Role differentiation is discussed in the light of the discussion of the Equilibrium Hypothesis, and from the discussion is developed Bales' theory of leadership. From this, the discussion moves to a consideration of SYMLOG, the System for the Multiple Level Observation of Groups, which is the culmination of Bales' work, and the distillation of his theoretical approach. Finally, the last section identifies some of the outstanding conceptual problems, specifically related to the concepts of 'group', 'leadership' and 'role differentiation'.

2. THE PHASES IN BALES' WORK.

Bales' work can very conveniently be divided into three major periods, punctuated by his major writings. The first phase was principally concerned with the development of the group observation system known as Interaction Process Analysis (IPA - Bales,

1950 a, b, 1970). This was probably his most influential period, covering not only the refinement and operational use of IPA, but also the work on phase sequences in groups and, towards the late 1950s his findings on role differentiation (the bifurcation of the leadership role into task and social specialisms).

The second major period, which began around 1958, saw the introduction of a three dimensional model of group interaction based on factor analytic findings such as those of Carter (1954), Clark (1953), Couch and Carter (1952), Sakoda (1952) and Wherry (1950). This culminated with the publication of Personality and Interpersonal Behaviour (Bales, 1970). The title is significant, since it highlights more than anything else Bales' interest in the unification of individual and group levels within a single theoretical framework (see also Bales, 1950 a: 259, footnote 3).

In this book the IPA categories, somewhat modified from 1950, are linked directly with what Bales was later to refer to as the three dimensions of the SYMLOG space. These are Upwards-Downwards (U-D), which is very roughly a dominance dimension; Forwards-Backwards (F-B), which corresponds with task activity or orientation; and Positive-Negative (P-N), which refers to friendliness (see Bales, 1970; Bales et al., 1979). These are discernibly those orthogonal factors, behavioural and perceptual, that Bales discusses in 1958: Individual Prominence; Aiding attainment by the group; and Sociability (Bales, 1958: 443; Carter, 1954). In many ways the 1970 book marks a transition between the end-points of IPA and SYMLOG.

The last phase of Bales' work is represented by the explicit elaboration of SYMLOG (Bales et al., 1979), although as he admits, there is still a great deal to do before the system is complete. SYMLOG is an acronym for the System for the Multiple Level Observation of Groups, and multiple-level is precisely what it is. It presents a series of techniques, together with attendant materials, which are designed to tap group processes at multiple levels, including overt behaviour, symbolic exchanges and 'fantasy'. These are conceived in terms both of groups and individuals; in behavioural and perceptual terms; and in terms of verbal and non-verbal acts. The language it uses is consistent across all levels, and couched in terms of the three-factor space described earlier.

SYMLOG is an impressive attempt to unify understandings of groups from the wider literature, including aspects such as clique formation and the attendant polarisation that this implies. As noted earlier, it is based precisely on the empirical results which Bales obtained as part of his work on role differentiation, and which he claims demonstrate that Activity, Task Ability and Likeability are the three dimensions upon which all evaluations and interactions within small groups are based (e.g. Bales, 1958).

3. INTERACTION PROCESS ANALYSIS.

It is no exaggeration to say that IPA has been one of Bales' most durable and influential contributions to the study of small groups. It has generated a considerable body of research in its own right, many imitations and developments (e.g. Borgatta, 1962, 1963, Borgatta & Crowther, 1965; Dunphy, 1968; Hare & Mueller, 1979; Morley & Stephenson, 1977). It has also provided the analytical tools for a substantial amount of research conducted by other workers (e.g. Barber, 1966; McFeat, 1974; Mishler & Waxler, 1968).

IPA consists of both a set of categories for the observation of group interactions, and an associated method (Bales, 1950 a: 257 - 258). The method is

> "... a type of content analysis in the basic sense, but the type of content which it attempts to abstract from the raw material of observation is the type of problem-solving relevance of each act for the total on-going process." (Bales, 1950 a: 258)

In Bales' words, the heart of the method is the systematic act-by-act recording of behaviour as it occurs in small face-to-face groups. The restriction to face-to-face interaction is important, and has implications for external validity, an issue which is to be addressed later in chapter 6.

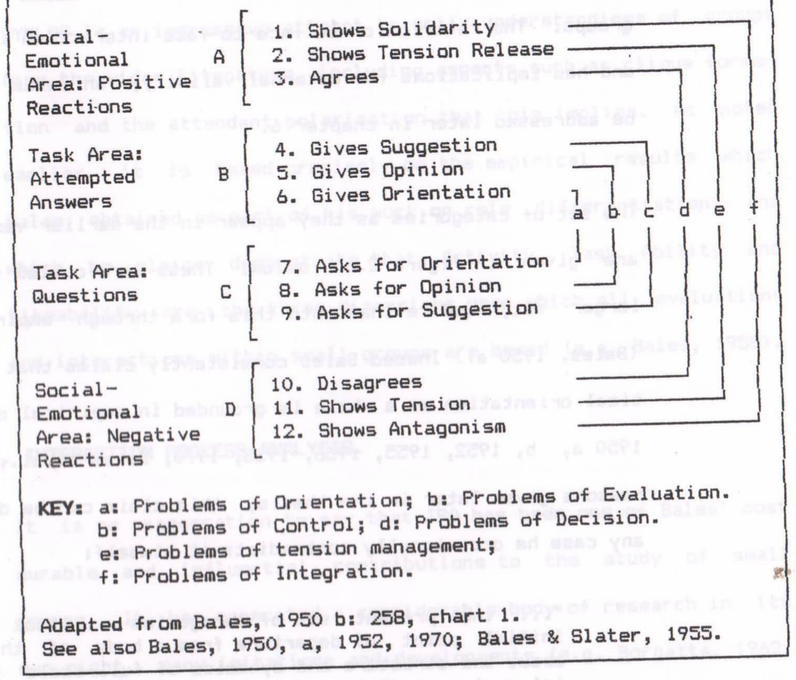
The set of categories as they appear in the earlier version of IPA are given in figure 2.1. below. These were culled from a much larger set, and refined into this form through empirical study (Bales, 1950 a). Indeed Bales consistently claims that his theoretical orientation as a whole is grounded in empirical data (Bales, 1950 a, b, 1952, 1955, 1956, 1958, 1970; Bales et al., 1979). For reasons given later in the thesis, this claim can be disputed. In any case he occasionally contradicts it himself:

> "... the present set of categories ... took its initial point of departure from a body of theory about the structure and dynamics of full-scale social systems." (Bales, 1950, b: 257)

It should be noted that the body of theory to which he alludes in this passage is never fully explicated, although there are good reasons to suppose that it is related to various forms of systems theory (Bales et al., 1979; Wilson, 1978), informed by a variant on Parsons' structural-functionalism (Parsons, 1949, 1961). Some of this is addressed below.

Of immediate interest is the way that Bales has grouped the twelve categories of IPA into two broader categories labelled task and social areas, which are then in turn further subdivided into two sub-categories.

Figure 2.1. Categories for Interaction Process Analysis (IPA)



KEY: a: Problems of Orientation; b: Problems of Evaluation.
b: Problems of Control; d: Problems of Decision.
e: Problems of tension management;
f: Problems of Integration.

Adapted from Bales, 1950 b: 258, chart 1.
See also Bales, 1950, a, 1952, 1970; Bales & Slater, 1955.

The main division of group interaction into task and social areas is important, and widely recognised, although not deriving from

Bales alone. It is a distinction which runs like a thread throughout the literatures on groups and leadership (see for instance, Benne & Sheats, 1948; Blake & Mouton, 1964; Fiedler, 1964, 1967, 1968, 1974, 1978; Fleishman, 1973; Katz & Kahn, 1978; Likert, 1955, 1961; Norfleet, 1948; Rauch & Behling, 1984; Thelen, 1956), indeed in one form or another it is to be found as an important distinction in most of the world's major thought systems (see for instance, Butler, 1964; Coudert, 1980; Halevi, 1972; Humphreys, 1961; Jung, 1967; Levi, 1913, 1923; Shah, 1957; Watts, 1975; H. Wilhelm, 1961; R. Wilhelm, 1968). For Bales the distinction is fundamental and it unifies many aspects of his work, informing amongst other things his theory of groups and, insofar as it is articulated at all, his theory of leadership, especially as it relates to role differentiation and the equilibrium hypothesis (Bales, 1953 a, 1958).

It can readily be seen that far from being merely an observation scheme, IPA is also the embodiment of a specific theory of groups.

Inseparable from IPA are the propositions about phase sequencing in group development (Bales, 1952, 1953 b, 1955; Bales et al., 1951; Bales & Strodtbeck, 1951; Borgatta & Bales, 1953 a; Heinicke & Bales, 1953), a set of propositions which has generated, and continues to generate, a considerable body of research and controversy (see e.g. Baker, 1981; Beck, 1981; Philip & Dunphy, 1959; Poole, 1981; Shalinsky, 1983; Schultz, 1980). The sequence proposed by Bales (orientation, evaluation, control) has considerable similarity to other proposed developmental sequences, such as Tuckman's (1965) "forming-storming-norming-performing" sequence,

but what is of most interest here are the terms in which Bales introduces it. The sequence is specifically formulated in terms of what he calls the "functional problems of interaction systems."

> "For purposes of the present set of categories [of IPA] we postulate six interlocking functional problems which are logically applicable to any concrete type of interaction system. ... these are in one-word terms: problems of orientation, evaluation, control, decision, tension management, and integration. These terms are all related to a hypothetical conception of an over-arching problem-solving sequence of interaction between two or more persons." (Bales, 1950 b: 259)

The sequence postulated is indicated on the IPA diagram by the square brackets to the right, labelled 'a' to 'f', and runs from the inside out. That is to say the phase sequence postulated begins in the central IPA area (categories 6 & 7: gives and asks for orientation), and runs out towards the periphery (categories 1 & 12: shows solidarity or antagonism - see Bales, 1952; Borgatta & Bales, 1953 a, b; Heinicke & Bales, 1953).

For the purposes of this thesis the precise ordering of these phases, indeed the postulation of phase sequencing itself, is not centrally important. But there are features of Bales' presentation which are. The first is obviously the postulation of functional problems which face interacting groups. He presents six but typically either discusses the three task problems (orientation, evaluation, control) while treating the socio-emotional problems as an undifferentiated category, or, most often, discusses simply the task and social areas both as global categories (see Bales, 1953 a, b, 1956, 1958; Bales & Slater, 1955; Borgatta & Bales, 1953 a, b). Thus, at least in his earlier work, there are two general functional problems facing groups, which can be summarised as task

and social problems. It is an essential feature of Bales' thinking that these two areas, or more specifically the actions which they imply, are held to be incompatible:

> "A very general belief, and one which I have held in various forms, is that there is some kind of almost inevitable contrary or interfering relation between the strength and elaboration of the technical division of labour and the strength and elaboration of the network of solidary affective ties within a given group. ... The belief in this contrariety between technical and social demands appears in many versions." (Bales, 1956: 148).

Nevertheless, if a group is to be effective and efficient, that is accomplish its tasks and survive with some measure of cohesion, then these two problem areas must be brought into dynamic harmony, or equilibrium (Bales, 1953 a). This is the Equilibrium Hypothesis which will be discussed further in the next section.

Secondly, it is important to appreciate that the propositions about phases do not suggest that in each phase a particular behaviour will be numerically more frequent than other behaviours. For example, it is not suggested that during the 'orientation phase' (categories 6 & 7) giving and asking for orientation is more frequent than, say, showing solidarity. The proposition is that during this phase giving and asking for orientation will reach its own internal peak, that is that it will be more frequent at this stage than in any other. Thus it is a proposition about relative frequencies (Bales, 1950 a, b, 1952, 1955, 1958; Bales & Bales & Strodtbeck, 1951; Borgatta & Bales, 1953 a, b; Heinicke & Bales, 1953). At first sight the relevance of this might appear obscure, but it has some importance for propositions about the equilibrium hypothesis and role differentiation, as will be made clear later.

4. THE EQUILIBRIUM HYPOTHESIS.

Implicit in all of Bales' writing about groups is some form of the Equilibrium Hypothesis, and the attendant Equilibrium Problem (Bales, 1953 a, 1956, 1958, 1965, 1968 a, 1970; Bales & Slater, 1955 - See also, Coch & French, 1958; Lewin, Lippitt & White, 1939; Parsons & Bales, 1955; Russett, 1966; Secord & Backman, 1974). In some ways the latter is the overarching functional problem facing interacting groups, subsuming the task and social problems discussed earlier. The problem is, quite simply, the harmonisation of task and social areas during group interaction, as suggested earlier (Bales, 1953 a: 449). It is this view of group dynamics, amongst other things, which places Bales firmly amongst the system theorists (Wilson, 1978).

Broadly stated, the equilibrium hypothesis, which is a species of balance theory, is both a behavioural and cognitive proposition. It suggests that an effective and efficient group is one that has established or maintained an appropriate balance between its task and social-emotional problem solutions, both at the group and individual member level. This last point is important because Bales operates conceptually and empirically at both levels, indeed so much so that it is sometimes difficult to discern what is appropriate to which.

The argument underlying the equilibrium hypothesis, broadly stated, is that task activity (that which tends towards goal achievement) creates imbalance, and thus tensions within the group. There is thus generated a need for social activity to

restore equilibrium. Social activities may, of course, be both positive and negative (see figure 2.1. above), but also it is positive social input which Bales sees as tending towards the restoration of balance, whereas negative social activities tend to reinforce the tendency towards disequilibrium:

> "Theoretically we tend to assume that a preponderance of positive reactions over negative is a <u>condition</u> of equilibrium or maintenance of the steady state of the system." (Bales, 1953 a: 453).

Even in the absence of specific negative social acts, however, the underlying suggestion is that there will inevitably arise a certain amount of negative affect (Bales, 1952, 1953 a, 1956, 1958) The successful group is not only able to cope with moderate amounts of tension release, in the form of jokes, laughter, and so on (too much and the job doesn't get done), but is also able to deflect or transmute such negative affect as there is and thus protect itself from destructive internal tendencies (Bales, 1953; Burke, 1967, 1968, 1969, 1972; Hare, 1976; Thelen, 1956).

It can be seen that given this sort of conceptual orientation it follows that social activity, **<u>actual</u>** and **<u>perceived</u>**, is an important, indeed essential, aspect of group interaction, an idea that is to found throughout the work in the groups field (e.g. Bennis & Shepard, 1956; Bion, 1961; Blake & Mouton, 1964; Fiedler, 1964, 1978; Hare, 1976; Katz & Kahn, 1978; Likert, 1955, 1961; Rauch & Behling, 1984; Schutz, 1955; Stock & Thelen, 1958; Thelen, 1956, and so on). Therefore, a successful group is one that achieves an appropriate balance between its levels of task and social activities, and these levels are determined by the task and social needs of the group and its members, which may, of course, be task and

context dependent (Borgatta & Bales, 1953 a; Mann, 1961; Marcus, 1960; Turk, 1961 a, b; Turk & Turk, 1962; Verba, 1961; Wilson, 1969).

It is important to note that balance need not take the form of a simple numerical equality between task and social inputs (in Bales' terms IPA acts in the task and social areas). Indeed there are good reasons for supposing that simple numerical equality is empirically unlikely. Conceptually it may be suggested that some groups, under some conditions, have or develop a large need for social input, for example because of the nature of the task, whereas others may have a very small need (Burke, 1967, 1968; Gustafson, 1973; Gustafson & Harrell, 1970; Hoffman & Smith, 1960; Turk, 1961 a, b; Wilson, 1969). Thus a notional weighting of task and social inputs may be suggested (Bales, 1953 a; Slater, 1955) such that the relative numbers of qualitative inputs needed to restore balance will vary from group to group, and perhaps within the same group over time. For example, in groups where task activity, or the task at hand, is perceived as a legitimate undertaking there might be relatively little need for specifically social activities, but in groups where for some reason task activity per se is not perceived to be legitimate, there might be a correspondingly high need for social activity both to maintain group morale and to motivate individual members (Burke, 1972; Gustafson, 1966, 1973; Gustafson & Harrell, 1970; Turk, 1961 a, b; Verba, 1961).

As another example, which also illustrates several points of some importance for later chapters, consider a situation where task activity per se is perceived to be legitimate and desirable, but

attempts to dominate are not. Such an example was presented by Verba (1961) in his criticism of Bales' work as if it were to be found only in the alleged intractably artificial circumstances of laboratory groups. But as noted in chapter 1, the situation is fairly common in what are called "social movement groups" (e.g. Brown & Hosking, 1984 - see also Bass, 1967), particularly where the isocratic ethic is paramount. In such situations one might justifiably suppose that domination attempts would lead to a group level need for social activity (Brown & Hosking, 1984). That is to say, not only task activity per se may be the generative force which creates the need for social activity, but also, and perhaps more importantly, the manner of its accomplishment. Thus, generally it might be suggested that any activity which ruptures normative expectations about appropriate behaviour will create a need for social activity to restore balance. This raises important points about the part that shared norms and values have to play in group activities, in particular it raises the issue of social order, which will be addressed in some detail in later chapters, especially those dealing with leadership.

It should be noted that operationally, even in the absence of recorded social inputs, balance may be assumed to have been achieved so long as other indirect criteria are met. One such criterion which has been suggested would be a high level of group member satisfaction:

> "... the level of accomplishment [of instrumental adaptive goals] can not be maintained for long without also maintaining the level of diffuse <u>satisfaction</u> which depends upon the achievement of expressive-integrative goals." (Bales, 1953 a: 453 - see also Heinicke & Bales, 1953).

5. ROLE DIFFERENTIATION.

The formulation of the dynamic properties of groups in terms of task and social functions raises the question of how they are to be accomplished, and by whom - this has typically been discussed in the language of roles. The most obvious suggestion is that the functional problems will be handled by the 'leader' of the group (e.g. Blake & Mouton, 1964; Fiedler, 1964), and indeed for Bales the accomplishment of equilibrium is central to processes of leadership. On the other hand, it could be, for example, that particular persons specialise in one or more problems, or that all members are equal in these respects. Bales has reported results, however, which seem to suggest that the two functional areas are typically accomplished by two persons which he has labelled the task and social specialists (Bales, 1953 a, 1956, 1958; Bales & Slater, 1955; Slater, 1955). This innocuous statement, however, conceals some extraordinarily complex conceptual issues, and has been the cause of considerable confusion.

Role Differentiation Theory, as Burke (1972) calls it (although it hardly deserves the title "theory") is a set of propositions concerning structural solutions to the functional problems outlined earlier:

> "... what we call the 'social structure' of groups can be understood primarily as a system of solutions to the functional problems of interaction. These solutions become institutionalised in order to reduce the tensions growing out of uncertainty and unpredictability in the actions of others." (Bales, 1953 a: 32 - 33).

To this extent the theory is a species of structural-functionalism (Parsons, 1949; Rauch & Behling, 1984).

The theory involves multiple levels of analysis, specifically individual and group levels, and the interactions between them. It also involves some fairly complex empirical and conceptual aspects. There is a basic distinction between role differentiation in a behavioural sense, and that in a perceptual sense (Bales & Slater, 1955). In this respect it is typically not very clear whether Bales intends it as one or the other, or indeed both, since he frequently writes as if it were intended in either sense without ever declaring a position. In view of this, the safest assumption to make is that it can be understood in either sense, although later in the thesis it will be argued that it is the perceptual sense of role differentiation which is the more fundamental (see chapter 9).

The literature, such as it is, is rife with misunderstandings about Bales' claims. To some extent the misunderstandings are his own fault; his writing, it has to be admitted, is frequently far from clear, and often leaps through levels of analysis without warning. On the other hand it is clear that he is dealing with difficult issues, and also that many of his commentators and critics appear not to have read him at all. This last point is particularly true of text book authors who typically graft Bales' work onto chapters about groups and leadership as if it were an awkward appendage which doesn't really fit. Later in the thesis a general theory of groups and leadership will be presented which places Bales at the very heart of the matter.

The confusion about role differentiation theory lies in two interrelated but separable questions. The first is whether a differen-

tiated role structure, involving task and social specialists, is one that inevitably emerges in interacting groups. The second is whether such a structure is the most adaptive for interacting groups. The distinction is, to some extent, related to the "is - ought" distinction mentioned earlier in chapter 1 (pp 50 - 51). To a great extent these are empirical questions, and as such they will be addressed in detail later in the thesis. They do have theoretical aspects, however, and the remainder of the section will be concerned with these.

Bales claims that role differentiation was an empirically grounded discovery, much as advocated by Glaser and Strauss (1967. See Bales, 1958, 1968), and it would be unreasonable to doubt that this was to some extent the case. On the other hand given Bales' conviction that group structure is the product of solutions to the functional problems of interaction, and his repeated suggestion that task and social activity are incompatible (Bales, 1953 a, b, 1956), a suggestion which does have some empirical support (Horsfall & Arensberg, 1949; Lanzetta et al., 1956; Rauch & Behling, 1984), then it can be seen that it was already implicit in his thinking. The data, to some extent, merely confirmed what he was already thinking (Bales, 1953: 460). This is not the same as claiming that task and social role differentiation is an inevitable outcome of group interaction, however, it is simply to point out that Bales' thinking left room for the observation of role differentiation to occur.

In point of fact, Bales explicitly considers other possible outcomes to group interaction, and the resolution of the equilibrium

problem, although it is role differentiation that he stresses. For example, he also considers "scapegoatism", that is, the deflection of negative affect away from the task specialist onto a low status group member (Bales, 1953; Burke, 1969). Yet another consideration was status struggle within the group aimed at unseating the source of disequilibrating tensions - the task specialist (Heinicke & Bales, 1953). Furthermore, he mentions several other role types that may occur within groups, including the "Great Man" (Bales, 1953 a; Bales & Slater, 1955; Borgatta et al., 1954 - see below, chapter 5, section 2). It is, however, quite clear, and this must be stressed, that for Bales these other options, although perhaps functionally equivalent mechanisms for draining off negative affect, are not stable options. That is to say, although they are functionally equivalent, they are not adaptively equivalent, in that they do not resore or maintain equilibrium, and cannot therefore ensure group survival (Bales, 1956).

Unfortunately most commentators take Bales to be suggesting that role differentiation is inevitable (e.g Katz & Kahn , 1978; Lewis, 1972, 1973; Rees & Segal, 1984; Senger, 1971), and admittedly it is not always obvious that he is not making this claim. But in a reply to one critic, Dr. Wheeler (Wheeler, 1957), Bales and Slater specifically deny that role differentiation does, or is meant to, apply to all groups in all situations:

> "The problem of assessing the frequency of occurrence of a given degree of specialisation is quite different from the problem of describing its characteristic quality when it does occur." (Bales & Slater, 1957: 153)

They do, however, describe role differentiation as a general phenomenon, and to some extent they are forced to do so given their claim that the equilibrium problem is a general problem faced by all groups. Nevertheless the effect is clearly paradoxical, and to some extent this is a consequence of sloppy language in the original papers.

The term 'role differentiation' is frequently used simply to refer to the emergence of differentiated roles of any kind, for example the development of disparities in activity rates (Bales et al, 1951). On other occasions it refers very specifically to the perceived and enacted behavioural separation of task and social activities (Bales, 1950 a, b; 1953 a, 1956, 1965, 1968 a, 1970; Bales & Slater, 1955). Of the first meaning of the term Bales is unequivocal in his conviction that roles of some kind do inevitably occur in interacting groups, but this is no more than the claim that differences will emerge in the quality and quantity of input to group activity that will be contributed by different group members (Bales, 1952, 1955, 1956; Bales et al., 1951; Bales & Borgatta, 1955; Bales & Hare, 1965; Bales & Strodtbeck, 1951). This is hardly controversial, but dual use of the one term is hardly conducive to clarity, and this partly explains the confusion about Bales' claims with respect to the more specific meaning of the term, that is the emergence of task and social roles as enacted by different people.

Part of the difficulty can be removed if distinctions are made between role differentiation, in the specific sense of two role specialists, at the conceptual level, at the general empirical

level and at the specific empirical level. The last two are addressed later in the thesis. At the conceptual level the propositions amount to the claim that the general leadership role can be separated into task and social roles; nothing is said at this level about how these roles are to be fulfilled.

Results at the empirical level suggest that the two roles <u>may</u> be filled by two individuals, <u>but not that they must be</u> (Bales, 1953 a; Borgatta et al., 1954). Theoretically there is no bar to the proposition that a single individual may, in some circumstances, fulfil both sets of functions, (Bales & Slater, 1955, 1957; Borgatta & Bales, 1956; Borgatta, Couch & Bales, 1954. See also Blake & Mouton, 1964; Goffman, 1959); that two activities are considered to be incompatible does not mean that a single person cannot fulfil them. Thus empirical evidence that task and social roles are in some circumstances integrated, that is fulfilled by one person (Lewis, 1972, 1973), is interesting but not fatal to the theory (Burke, 1973). To be consistent, however, it follows that if a single individual does fulfil both roles, then he or she must do so serially rather than in parallel, that is engage in task and social activities at different times and not simultaneously. This is not clearly spelled out in Bales' work, but as Bales claims that role differentiation is not inevitable (Bales & Slater, 1957), and that task and social activities are incompatible (Bales 1953, 1956), the serial accomplishment of task and social activities is the only possible consistent interpretation. This proposition, it will be noted, is also consistent with Bales' propositions about phase sequences in group interactions (Bales & Strodtbeck, 1951).

Role differentiation, understood as the behavioural separation of task and social functions, is one solution to the equilibrium problem. From what has been said before, at least one other solution to the problem, in structural terms, is also possible. That is the emergence of a single individual undertaking both functions (albeit serially). This is the option that Bales refers to as the Great Man option (although in deference to the contemporary Zeitgeist it will be referred to here as the Great Person option). It would be a mistake, however, to assume that these are the only two options considered by Bales. As noted earlier, he does, for example, list in all five possible emergent roles which might arise in response to the equilibrium problem (Bales, 1956: 156; 1958: 447). On the other hand, it is clear that Bales sees role differentiation, and possibly the Great Person option, as the only <u>stable</u> solution to the problem; the others, in his opinion, being only short term bootstraps which can not sufficiently deflect negative affect to ensure group survival (Bales, 1952). Theoretically, however, there are other options available which Bales did not address. These are described in the next section in connection with Gibb's concept of 'distributed leadership' Gibb (1969), which when combined with Bales' formulation increases the theoretical number of options.

6. BALES' THEORY OF LEADERSHIP.

The propositions about role differentiation are frequently to be found in text books under the heading 'leadership', and indeed that is where they belong, because role differentiation theory is a variety of process theory of leadership. Typically, however, the

authors of these texts are only really interested in the structural aspects of role differentiation. Generally they take Bales to be suggesting that all groups need both a task <u>'leader'</u> and social <u>'leader'</u>, which has led some to propose that groups ought to <u>appoint</u> some persons to a formal role with a specific remit for the social aspects of group affairs (Senger, 1971). In the political small groups movement, for example, there was at one time a good deal of discussion about the necessity for appointing what was referred to as a "vibes watcher" (see, for example, Jelfs, (undated)).

Such interpretations are, however, little more than a parody of what Bales was saying, and to some extent this can be seen in the sort of difficulties that arise from treating role differentiation in this way. It has already been remarked, for example, that most text book authors really don't know what to do with Bales, and the result is usually a rather unsatisfactory grafting-on of descriptions of his work with little integration of it into their general discussions (see, for example, Buchanan & Huczynski, 1985; Gordon, 1985; Handy, 1985; Mitchell, 1982; Napier & Gershenfeld, 1981). The reasons are not hard to find. By concentrating on the structural aspects of Bales' propositions about role differentiation, these authors miss the important things he has to say about leadership as interpersonal process, even though he doesn't say very much.

Although he says very little about it, it is clear that for Bales leadership is conceived, as with successful groups, in terms of an appropriate balance between task and social activity (Bales, 1953

a; Bales & Slater, 1955; Borgatta et al., 1954). That is to say, leadership, or perhaps one should say 'effective' leadership, reflects the functional requirements of the group:

> "Leadership is attributed to that member ... who best symbolises the weighted combination and integration of the two more specialised functions, i.e. task and social functions." (Bales & Slater, 1955: 298).

This point is important to bear in mind; it is one of the keys necessary for understanding role differentiation theory. Amongst other things it means that for Bales the task specialist is not necessarily the leader of the group, a point which is consistently overlooked in the literature. Authors persist in discussing task activity as 'leadership' (e.g. Koomen, 1988). This may be legitimate in the context of their own work; they are, as it were, entitled to define their terms as they wish to. If however they use the equivalence of task activity and leadership in discussions of Bales' work, then they are, quite simply, misinterpreting what he says. Leadership, for Bales, is the process of establishing and maintaining equilibrium between task and social inputs to group activity, although it is only fair to point out that he also concedes that in the type of groups he was dealing with, leadership was most likely to be attributed to the task specialist (Bales, 1958; Bales & Slater, 1955). Nevertheless, it must be emphasised that 'leadership', in Bales' formulation, could be attributed to the task specialist, the social specialist, or, indeed, some other group member if neither of the specialists represented the appropriate weighting of task and social inputs (Bales, 1958; Bales & Slater, 1955; Slater, 1955). Furthermore, as already pointed out, task and social specialists may not emerge as separable roles in some groups (Borgatta et al., 1954).

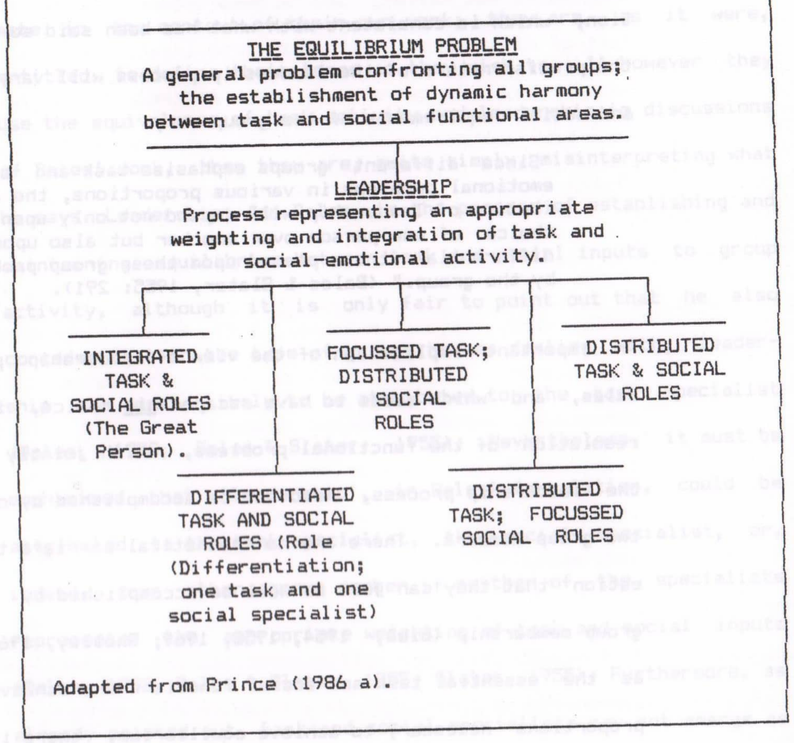
It is also important to be critical of authors who persist in referring to task and social 'leaders' within the context of Bales' work (see e.g. Burke, 1967, 1968, 1969, 1972; Hare, 1976; Gusafson & Harrell, 1970). Bales, it is true, referred to "the hypothesis of two complementary leaders" on one occasion (Bales, 1958), but by and large he refers to task and social specialists. This may sound like a trivial point, but it is important to maintain a distinction between the specialisms and leadership if some clarity is to be maintained in the discussion of Bales' work. The specialisms are only a part of the leadership process, although taken jointly, and in their correct measure, they constitute that process for Bales (Bales & Slater, 1955). But the clear implication, which is consistent with what has been said so far, is that the precise nature of the leadership process will vary as the task and social requirements of the group vary:

> "Since different groups emphasise task and social emotional problems in various proportions, the attribution of leadership will depend not only upon the choice of one person over another but also upon the differential stress placed upon these group problems by the group." (Bales & Slater, 1955: 291).

An important implication of the view of leadership proposed by Bales, and which seems to have escaped his notice, is that the resolution of the functional problems, which jointly constitute the leadership process, need not be accomplished by one or even two group members. There are no theoretical barriers to the suggestion that they can just as well be accomplished by the entire group membership (Gibb, 1954, 1958, 1969; Shelley, 1960). So long as the essential task and social functions are achieved in the proportions necessary to achieve equilibrium, there is no reason why they must be achieved by only a minority of the group. This is

essentially the proposition made by Gibb (1969) which he referred to as 'distributed leadership', although sadly to which he only allowed a brief paragraph. Nevertheless, when combined with Bales' functional systems view of groups and leadership, it yields a fairly complex set of viable resolutions to the equilibrium problem described by Bales, and furnishes yet another reason why the role differentiation option is, statistically, unlikely to be the only structural form which emerges during group interaction. Some of the structural outcomes which are theoretically possible are given in figure 2.2 below (see also Prince, 1986 a).

Figure 2.2. Some theoretical possibilities for group structure in relation to the Equilibrium Problem.



Adapted from Prince (1986 a).

One aspect of Bales' theory of leadership which has already been emphasised throughout the discussion is that it is presented in the same terms as his formulation of a successful group. This is in some ways unique because in this way Bales presents an integrated view of both leadership and groups, although again it is important to emphasise that he does not take this formulation very far. The implications of this sort of approach are, however, very far reaching, and at the risk of exaggeration, it could be claimed that it has the potential for integrating the wide and disparate literatures on both leadership and groups in a way that has not been achieved so far (See for example, Hare, 1976; Stogdill, 1974). This presents exciting possibilities, and some of the issues that are connected with it are explored in some detail in the chapters following immediately.

7. S Y M L O G.

SYMLOG is an acronym for the SYstem for the Multiple Level Observation of Groups. It represents the culmination of Bales' work with groups, as a theorist, researcher, teacher and practitioner, although as he himself admits, it is the product of a collaboration between himself and a considerable number of associates (Bales et al., 1979). The intention behind SYMLOG is ambitious, and to a very great extent unique, because it aims to unify and integrate insights about groups at all levels of analysis, and in their full dynamic complexity:

> "The SYMLOG System ... is a "system" in the sense that it consists of a number of different methods of measurement, integrated with a broad and consistent social psychological theory on the one hand and with practical processes on the other, ... It is adapted for use in natural groups as well as for use in

laboratory training and experimental groups." (Bales et al., 1979: 7).

As mentioned earlier, SYMLOG is in direct line of descent from IPA, with which it has some features in common, with the principal points of development marked by Bales' major publications (Bales, 1950, 1970; Bales et al., 1979).

The heart of SYMLOG method is, as with IPA, observation. The levels of SYMLOG, however, go beyond the IPA (behavioural) level, to include behaviour, perceptions, values, and so on. It comprises a number of related techniques which can be employed either by group members or outside observers, concurrently with the interaction or retrospectively. The most basic distinction is between what is known as "scoring" and "rating" (Bales et al., 1979: 4).

Scoring is basically the same technique as used with IPA, and can be conducted both obtrusively or unobtrusively. Scorers use prepared marking sheets and record their impressions concurrently with the interactions (Bales et al., 1979: appendix F, pp 410 - 411). Scoring does not, however, restrict itself to behaviour alone; it is repeatedly emphasised that it is intended to capture:

> "... information not only about the behaviour of individuals but also about the content of what they say and the attitudes they express." (Bales et al., 1979: 4).

Rating, on the other hand, is fundamentally a variant on standard sociometric techniques (Knoke & Kuklinski, 1982; Lindzey & Borgatta, 1954; Moreno, 1934, 1941, 1951, 1953; Proctor & Loomis, 1951) used either by group members or observers or both. There

are, however, differences between SYMLOG and Sociometry, particularly with respect what have been called 'isolates':

> "... some group members are important to the group as a whole and yet do not appear in any particular person's list of individual preferences. In the usual sociogram, they would emerge as isolates. In the sociogram constructed from relationships significant to the group as a whole, such persons are shown to have an important role either as deviants or as linking persons in group attempts at unification." (Bales et al., 1979: 502. See also Cohen, 1972).

The rating procedure is actually a collection of several methods, although all use the same SYMLOG Adjective Rating Form (see below, appendices E, F, and G, and Bales et al., 1979: appendix C, pp 392 - 395), sometimes in conjunction with the Significant Relationships Form (Bales et al., 1979: appendix V, pp 498 - 502) to which the quotation above refers. The Adjective Rating Form uses an abbreviated set of adjectives which approximate a description at the behavioural level, although there is also a less well tested version aimed at capturing information about values (Bales et al., 1979: appendix W, pp 503 - 504). Since the rating procedures adopt this abbreviated form

> "The levels are not clearly distinguished ... which makes the Rating procedure much simpler than the Scoring, though inherently more ambiguous. In practical use, however, the Ratings seem to tap very well in most cases the intuitive global perceptions that group members have of each other." (Bales et al., 1979: 10).

Thus ratings provide a more straightforward source of data, but in comparison with scoring, the data are impoverished. Nevertheless, ratings are not simply a substitute for scoring, because they offer information of a different order. Specifically, the ratings procedures are designed to tap information about group member

perceptions of interaction, as well as those of observers, whereas scoring is rather more appropriate to observation alone:

> "SYMLOG Rating may best be understood as a simplified global version of the operations performed in SYMLOG Scoring. The theoretical heart of SYMLOG is evident only in the Scoring method, not in the Rating." (Bales et al., 1979: 17).

7.1. THE SYMLOG LEVELS.

The SYMLOG Scoring Method will not be used in this thesis, so it is not appropriate to describe it in detail. It is important, however, to describe the levels which scoring is intended to record, since these give not only a very clear idea of just how complex SYMLOG is, but also give some indication of those aspects of group interaction which Bales considers to be important.

"Levels", as a term, is used fairly loosely within SYMLOG. There is a distinction drawn between overt intended acts directed towards other people (referred to as ACT within the notation of the system) and "the nonverbal aspects of behaviour" (NON). Acts are regarded as having both behavioural and content aspects, there being a distinction between what a person does and what they say. In each case the distinction is referred to as a difference in levels. More important, however, is that each act is considered to have several levels, or aspects, of meaning, and the system aims at coding each aspect separately (Bales et al., 1979: 9).

The content of interaction, what is said rather than done, is divided into several different classes, which are kept separate. Briefly, these are:

1) References to (or descriptions of) the self (SEL),

2) References to another specific other group member (OTH),

3) References to the group as a whole (GRP),

4) References to the immediate external situation in which the group interaction takes place (SIT),

5) References to general features of the environing society (SOC),

6) References to any kind of thing, real or imaginary, which is judged by the observer to be informative about the imagination and feeling of the person speaking (FAN, for fantasy).

(Bales et al, 1979: 9. See also appendix A, pp 355 - 386). These classes are also referred to as levels.

Finally, SYMLOG makes explicit reference to value judgements and attitudinal statements. These are said to be either in favour of (PRO) or against (CON) some content image.

All of these levels are further collapsed into a set of three summary levels, as follows:

1) The Behavioural level,

2) The Content Image level, and

3) The Value Judgement level.

These are summarised in figure 2.3 below.

Figure 2.3. Summary of the SYMLOG levels.

BEHAVIOURAL LEVEL	CONTENT IMAGE LEVEL	VALUE JUDGEMENT LEVEL
ACT	SELF	PRO
NON	OTHER	CON
	GROUP	
	SITUATION	
	SOCIETY	
	FANTASY	

Adapted from Bales et al., 1979.

7.2. THE SYMLOG SPACE.

The backbone of the system, and its primary theoretical aspect, is the three-dimensional SYMLOG space (see figure 2.4), which was developed from the results of factor analytic studies conducted in the early fifties (Clark, 1953; Couch and Carter, 1952; Sakoda, 1952; Wherry, 1950; Wispé, 1955). In a review of some of these studies Carter (1954) suggested that three factors appeared sufficiently often for them to be considered somehow 'basic' to interpersonal perception, which he called:

1) Individual prominence and achievement
2) Aiding attainment by the group
3) Sociability

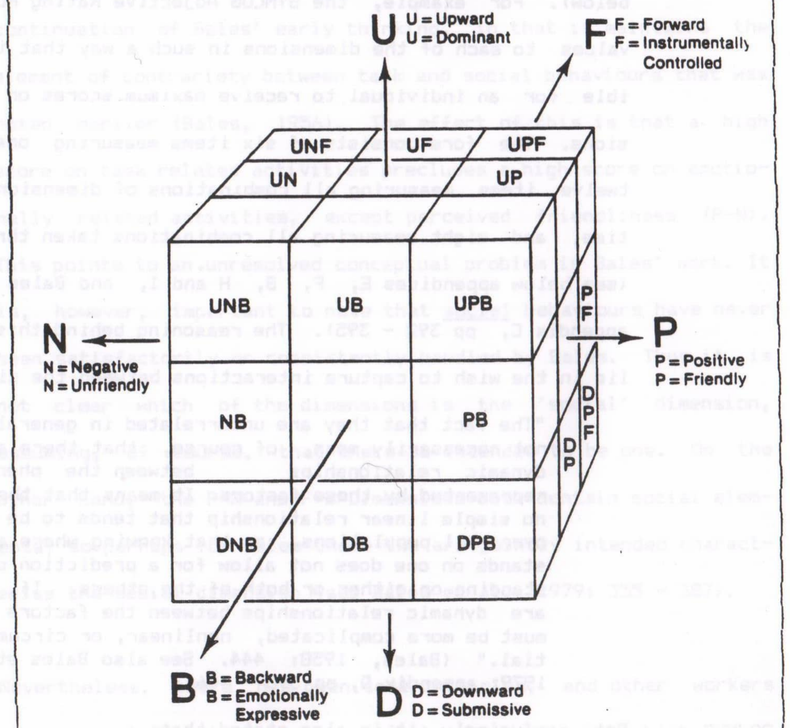
These Bales adopted wholesale, relabelling them "activity", "task ability" and "likeability" (Bales, 1958: 444), which in SYMLOG became:

1) U - D (Up - Down), which is a dimension of Dominance and Submission;
2) P - N (Positive - Negative), which is a dimension of Friendliness and Unfriendliness;
3) F - B (Forwards - Backwards), which is a dimension described as Instrumentally Controlled versus Emotional Expressiveness (Bales et al., 1979: 9. See also Bales, 1970).

His comments in 1958 reveal the thinking which lies at the heart of the whole SYMLOG system:

> "These factors seem to represent underlying dimensions in the evaluations persons make of each other, whether as observers or as fellow group members. It may be that the best way of looking at these factors is ... as frameworks in which the perceiver responds to personality traits of others." (Bales, 1958: 444).

Figure 2.4. The SYMLOG Three Dimensional Space.



From Bales et al., 1979: 23 & 177.

Importantly, and this seems to have emerged from empirical rather than theoretical work, the three factors are conceived of as orthogonal axes within a three dimensional cartesian space, or "field". That is to say:

> "... the important thing to note is that ... the three factors, ..., are not, in general, mutually exclusive; a high standing on one does not preclude or interfere with a high standing on the other. Nor are they mutually supportive in general, but, rather, they tend to be uncorrelated." (Bales, 1958: 444).

Nevertheless, as they are operationalised in the SYMLOG ratings scales, the factors are not completely independent (see appendix I below). For example, the SYMLOG Adjective Rating Form assigns values to each of the dimensions in such a way that it is impossible for an individual to receive maximum scores on <u>all</u> dimensions. The form consists of six items measuring one dimension, twelve items measuring all combinations of dimensions two at a time, and eight measuring all combinations taken three at a time (see below appendices E, F, G, H and I, and Bales et al, 1979: appendix C, pp 392 - 395). The reasoning behind this appears to lie in the wish to capture interactions between the dimensions:

> "The fact that they are uncorrelated in general does not necessarily mean, of course, that there are no dynamic relationships between the phenomena represented by these factors. It means that there is no simple linear relationship that tends to be found over all populations, so that knowing where a man stands on one does not allow for a prediction of his standing on either or both of the others. If there are dynamic relationships between the factors they must be more complicated, nonlinear, or circumstantial." (Bales, 1958: 444. See also Bales et al., 1979: appendix D, pp 396 - 406).

But, confusingly, it is also stated that:

> "The purpose is to clarify the behaviour and trait descriptions referred to by each factorial combination and to attempt to construct a conception of the dimensions so that they are conceptually independent." (Bales et al., 1979: 396).

From this one can only conclude that the axes of the SYMLOG space are in fact only quasi-independent factors, although whether the implications of this are serious is perhaps a moot point. It is, for example, quite clear that too much talking (U-D) is likely to affect the level of liking that one receives (F-B), although, as Bales points out, not in a simple straightforward way (Bales, 1958; Bales & Slater, 1955)

One relationship which is implicit in the SYMLOG dimension F-B (Instrumentality versus Emotional expressiveness) is a direct continuation of Bales' early thinking, in that it maintains the element of contrariety between task and social behaviours that was noted earlier (Bales, 1956). The effect of this is that a high score on task related activities precludes a high score on emotionally related activities, except perceived friendliness (P-N). This points to an unresolved conceptual problem in Bales' work. It is, however, important to note that <u>social</u> behaviours have never been satisfactorily or consistently handled by Bales. Thus it is not clear which of the dimensions is the 'social' dimension, assuming, of course, that there is intended to be one. On the other hand, the P-N and F-B Dimensions both contain social elements, so perhaps for Bales these two are jointly intended characterise the social dimension (see Bales et al., 1979: 355 - 387).

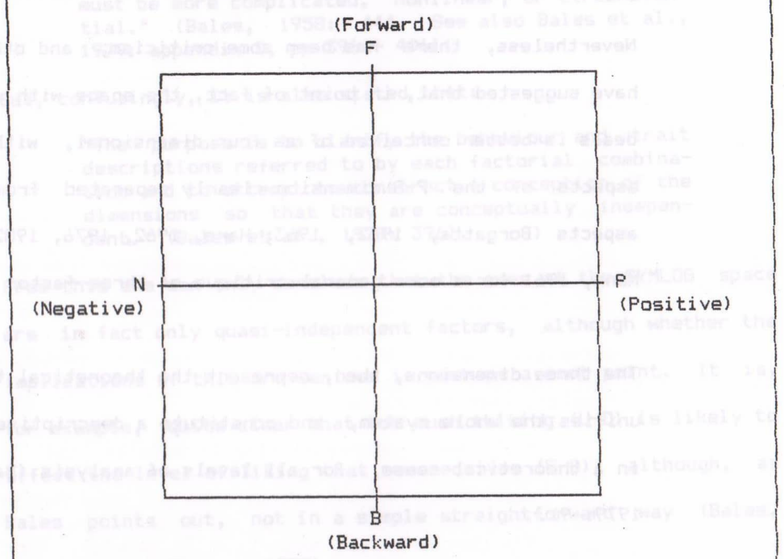
Nevertheless, there has been some criticism, and other workers have suggested that, in point of fact, the space with which SYMLOG deals is better conceived of as four dimensional, with the social aspects of the F-B dimension clearly separated from the task aspects (Borgatta, 1962, 1963; Hare, 1962, 1976, 1982 - See also Mann, 1961 for a more general critique of three-factor space).

The three dimensions, then, represent the theoretical thread which unifies the whole system, and constitute a descriptive framework, in a theoretical sense, for all levels of analysis (Bales et al., 1979: 9).

7.3. FIELD DIAGRAMS.

Once the data have been gathered, whether by rating or scoring methods, they are inscribed on a SYMLOG Field Diagram (See figure 2.5 below, and Bales et al., 1979: passim. See also Hare, 1962, 1976, 1982). Field diagrams are a kind of three-dimensional graph. The values for the F-B and P-N dimensions are plotted on a two-dimensional 'slice' of the SYMLOG space (located at '00' on the U-D dimension), as in conventional two-dimensional Cartesian coordinate systems. Values for U-D are indicated by an outer circle circumscribing the point, the larger the circle, the more dominant the person. The scale of these circles, as presented in Bales et al (1979), is based on a restricted range of sizes which was dictated by the limitations of commercially available circle templates (Bales et al., 1979: appendix M, pp 437 - 439).

Figure 2.5. The SYMLOG Field Diagram.



From Bales et al., 1979: passim

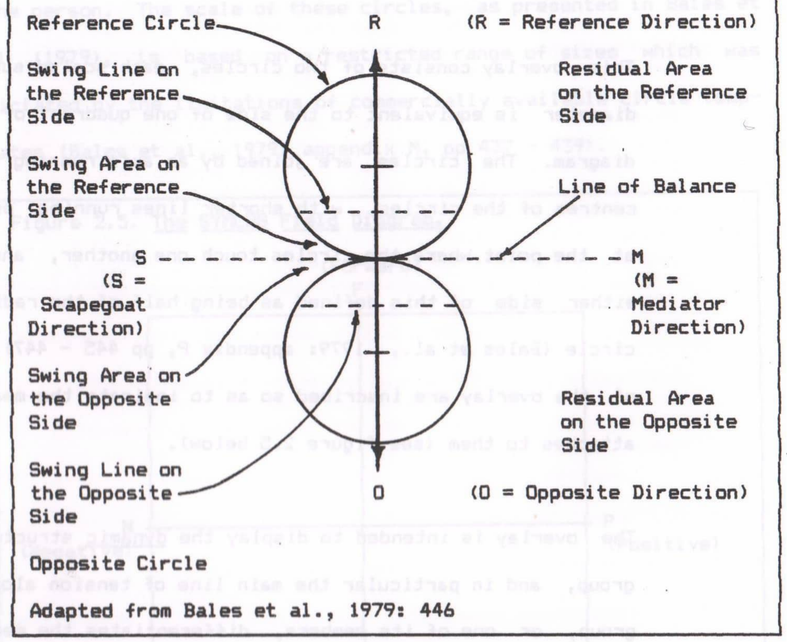
The field diagram, as a species of graph, lends itself to the kinds of quantitative and qualitative analyses that are employed within graph theory (Harary & Norman, 1953), especially geometric and trigonometric calculations of graph distances. It also lends itself very well to the sorts of qualitative analyses typically undertaken on the sociograms of traditional sociometric theory (Lindzey & Borgatta, 1954; Moreno, 1941, 1953; Proctor & Loomis, 1951) and network analysis (Knoke & Kuklinski, 1982). There are, however, other forms of analysis available for SYMLOG Field Diagrams which are unique, the most important of which is the Polarisation-Unification Overlay.

This overlay consists of two circles, each scaled such that the diameter is equivalent to the side of one quadrant of the field diagram. The circles are joined by an axis running through the centres of the circles, with shorter lines running perpendicular at the point where the circles touch one another, and at a point either side of this defined as being half of the radius of the circle (Bales et al., 1979: appendix P, pp 445 - 447). The points of the overlay are inscribed so as to indicate the meaning which attaches to them (see figure 2.5 below).

The overlay is intended to display the dynamic structure of the group, and in particular the main line of tension along which the group, or one of its members, differentiates the members of the group. It is fitted manually onto a completed field diagram according to specified heuristics (Bales et al., 1979: appendix Q, pp 448 - 453). These latter amount to, first of all, trying to get as many of the points of the field diagram into one circle as poss-

ible, and where it is not possible to contain them all, trying to obtain a 'best fit' in which most of the points fall into one circle or another. To some extent fitting the main line of polarisation to a field diagram is like deriving a regression line. In any event, Morley (1987) has demonstrated that the heuristics suggested by Bales and his colleagues are equivalent to the derivation of the product of the moments about the points of the diagram, and work is under way to automate the process of fitting the overlay.

Figure 2.6. The Polarisation-Unification Overlay.



Adapted from Bales et al., 1979: 446

The importance of the overlay lies in the attributions given to the various points. In particular it indicates the main subgroups, should they exist, and therefore the persons between whom conflict is most likely to occur. Since the line of polarisation is also

oriented with respect to the main axes of the diagram, it also gives some indication of the sorts of conflict that might occur, although because of the complexity of the interrelations between variables, and the different levels of analysis, precise prediction is not possible, and nor is it essential. SYMLOG is, in many ways, geared towards 'self reflective' groups, and is intended in large measure to provide instant feedback, or 'therapeutic' interventions. It is a system designed to provide insights, not predictions (Bales et al., 1979: 3 - 10).

Finally the areas either side of the line of polarisation along the line of balance are also important. These indicate persons who are likely to play, or be given, the roles of scapegoat or mediator, and, as noted earlier, both of these roles have implications for leadership phenomena (Bales & Isenberg, 1982).

7.5. MULTIPLE LEVEL FIELD THEORY.

So far this section has concentrated on a description of the main features of SYMLOG as a method of gaining insights about group dynamics, and as a framework for integrating the levels of analysis. Little has been said about the underlying theory, which is called **Multiple Level Field Theory**, or sometimes **Systematic Multiple Level Field Theory** (Bales et al., 1979: 12).

This theory, which is not given in detail, apparently was developed after the development of the field diagram, and crystallised in the propositions relating to the Polarisation-Unification overlay (Bales et al., 1979: xv). Thus, consistently with earlier claims, Multiple Level Field Theory is presented as an empirically

grounded theory (Glaser & Strauss, 1967). Nevertheless, it is clear that elements of the broader theory, that is to say those elements that constitute assumptions underlying the "heuristic hypotheses" by which Multiple Level Field Theory is explicated, owe their origins elsewhere. Indeed, it is no exaggeration to suggest that they lie in theoretical work covering almost the whole range of the human and social sciences.

In presenting the theoretical background to SYMLOG Bales and his colleagues manage to cite an astonishing range of work. It is well beyond the scope of this section to try and report all of the theoretical inputs indicated, but there are some interesting inclusions which can be sampled. For example motivation and personality concepts within SYMLOG are, so it is claimed, based on Freudian Psychoanalytic Theory (Freud, 1900, 1933). Indeed, it is claimed that the whole orientation of multiple level field theory is psychoanalytic to some extent:

> "... but psychoanalytic theory does not provide the conceptual means for representing adequately the interpersonal and total inclusive group levels of social processes or a way of getting from a view of the individual level of psychological processes to a view of the pairs of individuals and on to a view of the total inclusive social interaction field." (Bales et al., 1979: 13).

Thus, the concept of an individual in SYMLOG is a psychoanalytic one. But moving to concepts and assumptions about individuals in a social context, Bales and his colleagues draw from theories of social cognition and gestalt psychology. Quite obviously, as the name Multiple Level Field Theory implies, there is a large influence from Kurt Lewin and the idea of life space as detailed in Lewinian Field Theory (Lewin, 1951). Similarly, the theory of

polarisation-unification has been influenced, inter alia, by balance theory (Newcomb, 1953; Heider, 1958), congruity theory (Osgood & Tannenbaum, 1955), dissonance theory (Festinger, 1957), consistency theory (Abelson et al., 1968) and attribution theory (Kelley, 1971), (Bales et al., 1979: 11) to which might be added Bales' own conception of equilibrium (Bales, 1953).

From sociology Multiple Level Field Theory draws its insights from symbolic interactionism (Mead, 1934; Blumer, 1969; Goffman, 1959)

> "... in the emphasis given to the importance of the self-image and the individual definition of the situation, and in the stress on the communication of "meaning" in the manner and content of social interaction, rather than on the physical substrate of behaviour." (Bales et al., 1979: 11)

In addition, other theories cited mentioned social exchange theory (Thibaut & Kelley, 1959; Homans, 1961), reference group theory (Merton & Kitt, 1950) and structural-functionalism (Parsons, 1951). In regard to the latter they comment that the theory of polarisation-unification is a partial resolution to the debate within sociology

> "... as to how much emphasis should be given to the influence of common values and norms of participants in a social interaction field and how much to conflicts of interest between the various participants and to differences in their relative power. This problem, often represented as a conflict between adherence to structural-functional theory (Parsons, 1951) and adherence to conflict theory (Dahrendorf, 1959), receives a kind of answer, perhaps, in the present approach, where both polarisation and unification are recognised, but the relative preponderance of the two is determined empirically and may be different for each interaction field." (Bales et al., 1979: 12)

The ambitiousness of the SYMLOG project is nowhere more apparent than in the discussions of the sources of influence on the general theory. It is evident that Bales and his colleagues are aiming at nothing less than the complete integration of the whole of group psychology. Such an ambitious project is bound to have its loose ends. And so it is with Multiple Level Field Theory; as they admit in relation to the theories of social cognition cited earlier:

> "... the relationships to these cognitively oriented theories are complex and far from adequately worked out." (Bales et al., 1979: 11).

Nevertheless, they are careful to answer the charge that Multiple Level Field Theory is simply a rag bag of theoretical bits and pieces:

> "Systematic Multiple Level Field Theory ... is not an eclectic assembly of elements from these many sources, ... but a newly developed and integrated whole based on new methods of observation and expressed in a new language and set of concepts. It was not in fact developed by a careful fitting together of deductions from these various sources but grew inductively from a long continued effort to understand social interaction from observation, to construct measuring instruments for recording and analysing the dynamics of small groups and for feedback of useful information to participants. It has been a grounded theory (see Glaser and Strauss, 1967) from the first." (Bales et al., 1979: 12 - 13.).

Thus it can be seen that the theory and practice of SYMLOG are in fact inseparable.

8. SUMMARY AND OUTSTANDING ISSUES.

This chapter has concentrated on the historical development and theoretical aspects of Bales' work with small groups since the 1950s. The principal emphasis in the first part of the chapter was

given to his early theory of groups, particularly with reference to the equilibrium hypothesis and role differentiation. It was argued that his approach presented the opportunity for studying groups in such a way as to integrate understanding of groups and leadership under a single formulation.

The last part of the chapter dealt extensively with SYMLOG, which is the culmination of his work to date. The links and similarities between SYMLOG and earlier work were emphasised, but the discussion went further and demonstrated the full ambitiousness of the project. This last aspect of the discussion of SYMLOG, although to some extent peripheral to the main themes of the thesis, was considered to be important since it not only demonstrates the complexity of Bales' approach, which is often overlooked in the literature, but also it demonstrates very well the theoretical basis, and ultimate goals, of Bales' work.

The discussion of Bales work, and that of his colleagues, has provided a considerable amount of material with which to begin the task of tackling some of the questions about leadership and the development of structures in groups which were introduced in the introduction. But there are some important issues which have not been addressed, and which are not addressed by Bales. In particular, while Bales is very careful to define what he means by a group (see chapter 3, section 2 below), what he does is little more than give some idea of the physical attributes that such groups have. What he does <u>not</u> do is provide any discussion or criteria by which one may distinguish a <u>group</u> as opposed to a mere collection, or aggregate, of individuals who perhaps share the

same attributes. That is, he fails to provide any indication of what, in social psychological terms, a group is. This, and related issues are discussed in the next two chapters.

Finally, although leadership has been approached in this chapter, the discussion has been very particular, being located in the context of Bales' conception of equilibrium between task and social needs and behaviours. Furthermore, the relationship between the twin concepts 'leader' and 'leadership' has so far been treated in a way that is fairly standard for the literature, that is loosely, and without any clear indication of precisely how they relate. This is not a trivial matter since it has implications for the way one conceives of the ways in which groups organise to achieve their goals. This issue is also tackled in the next two chapters.

Only after these issues have been addressed, can an adequate critique of Bales empirical work be made. Thus discussion of the empirical aspects of role differentiation, which is the feature of Bales' work of most interest here, is left until chapters 5, 6, and 7 below.

CHAPTER 3: ON GROUPS.

1. INTRODUCTION.

It has been argued that all of social life is group life (Douglas, 1983). This suggests that if we are to develop a full understanding of human behaviour, in the broadest sense, then we need to have a thorough understanding of groups and group phenomena, whether as contexts for individuals, as dynamic entities in their own right, or as parts of wider systems. As Lewin (1943) observes:

> "... there is no hope for creating a better world without a deeper insight into the function of leadership and culture and of other essentials of group life." (In Zander, 1979 a: 418).

Unfortunately, the state of epistemic grace that this implies is typically not obvious in the general area covered by the rubric "group research". Group work seems to have fallen under the spell of pessimism, although a pessimism which is currently common to most of the social sciences, psychology in particular (see for example Westland, 1978). Recent reviews of group research point to the lack of well developed theories (McGuire, 1986; Zander, 1979 a, b) which have limited applicability:

> "For all the research in this area, relatively few of the experimenters worked within a general theoretical context which would allow them systematically to relate their results to the results of others." (Hare, 1976: 394).

Borgatta, in a recent review of the history of group research, points out, for example, that:

> "... designs that were clearcut and should lead to relatively unambiguous clarifications of theory were few and far between, and theory tended to be not middle range but microrange or ad hoc." (Borgatta, 1981a: 614)

More recently McGuire (1986) has pointed to the plethora of concepts and terms, mastery of which "... constitutes a formidable initiation fee for potential recruits" (p96), but which, in the view of Zander, are in turn only vaguely understood and frequently confused:

> "As things now stand, researchers in group life are remarkably inventive in creating new terms for phenomena that already have a perfectly useful name, thus creating more semantic confusion than need be." (Zander, 1979b: 280)

To which might be added Shotter's point that in psychology at large there is a general need for more, and more rigorous, conceptual analysis (Shotter, 1975; See also Harré, 1979; 1984; Harré & Secord, 1972).

Whilst agreeing substantially with all of these comments, it has to be said that they tend to present a more depressing picture than is necessary. It is undeniable that the literature on groups, both psychological and sociological, is vast, complex and subtle. Hare (1976), for instance, managed to muster over 6,000 references for his monumental Handbook, and as Borgatta gloomily observes:

> "... in the great morass of literature it is possible to miss a great deal .... unless one reads widely." (1981a: 617)

This is consistent with Hare's admission that of the references he accumulated, he was able to read only a small fraction first hand,

relying on abstracts and second hand accounts for the rest (Hare, 1976). Moreover, most of the key concepts of the area, including the most fundamental one "group" itself, are difficult and complex. It is hardly surprising, therefore, that this state of affairs is reflected in the nature of the literature itself. But it is too easy to be intimidated by the complexity and conclude that there is no coherence to the field. Despite the manifest problems and complexities of the groups literature, and the pessimistic prognostications of commentators (McGrath & Kravitz, 1982; Zander, 1979 a, b), there are a number of themes which occur with some regularity, suggesting that the field is not as disparate or as fragmented as it might initially appear. It is part of the purpose of this chapter is to present a view which supports this claim.

Although necessarily selective this chapter will examine the concept "group" through the themes occurring in the literature. Section two criticises existing attempts to define "group" as unhelpful because they typically conflate two distinct processes; the description of the physical attributes of the objects of study, and the definition of the social psychological attributes of phenomena called groups, as opposed to collections or aggregates. It is argued that the first, that of isolating particular ranges of social phenomena for study, is better covered by the term "boundary setting", whereas the second, that of establishing criteria by which to draw distinctions between groups and related phenomena, is better called "defining". Following this is a brief sketch of some of the principal features of the boundary setting approach and some evaluation of the implications for group research. A summary taxonomy is presented of group dimensions,

along which definitions of group and related terms, such as aggregate, vary, and a description is given of how boundaries might be set using these dimensions. The final part of the chapter presents a definition of group in terms of the construct "social order", and relates this to Bales' conception of equilibrium. This lays a foundation for the following chapter on leadership.

It is argued throughout that the fixing of the key terms of group research is a function of pragmatic necessity, and that attempts to define them universally are unnecessary. The advantages of the approach are stressed, as a necessary step in the formulation of a unifying framework.

2. TOO MANY DEFINITIONS OF "GROUP".

> "From our point of view ... [the] ... various definitions [of group] simply identify different kinds of groups, and little is to be gained from arguments over which is the 'true' one." (Cartwright & Zander, 1968: 46)

The multiplicity of definitions of "group" abounding in the literature might be taken to indicate the presence of serious discontinuities in the field. It is of course true that there is no single generally agreed definition of "group", and it is also true that the scope of definitions varies enormously with respect to what is included and what is excluded. For example, on the one hand there are minimalist definitions, such as the one offered by Berkowitz which includes almost nothing in the way of specified features, and which therefore exclude almost no social phenomena:

> "a group is a collection of individuals who react to each other in some way, however indirectly." (Berkowitz, 1980: 407)

On the other hand there are also tightly circumscribed definitions which attempt to list several features, and enunciate them in precise detail, such as the one offered by Bales (1950):

> "[A group is] ... any number of persons engaged in interaction with each other in a single face-to-face meeting or a series of meetings, in which each member receives some impression or perception of each other member distinct enough so that he can, either at the time or in later questioning, give some reaction to each of the others as an individual person, even though it be only to recall that the other person was present." (Bales, 1950: 33)

These and similar definitions express the intuition, described by Douglas (1983: 36), that to many people, including researchers, a group is a collection of people gathered together in one place, at one time, usually for a common purpose. But this is to ignore the second tradition of group research in social psychology which considers "groups" as <u>social categories</u>; an equally venerable tradition exemplified by the work of Sherif (e.g. 1967) and Tajfel and his colleagues (e.g. Tajfel, 1981, 1984; Tajfel & Turner, 1979). As Turner and Giles (1981) point out, there is no necessary connection between the two approaches, but then neither are the two traditions entirely distinct, as Sherif's "Robber's Cave" studies demonstrate (e.g. Sherif, 1951; Sherif & Sherif, 1953).

The variety of definitions and approaches quickly leads to the feeling that the field is lacking in unity. The view advanced here, however, is that the state of discontinuity is more apparent than real. Part of the problem lies in the use of the word "definition" to describe the various attempts at delimiting what are, or are not, to count as groups for the purposes of study. The word

"definition" carries with it connotations of universality, whether or not these are intended by particular authors. More precisely:

> "When an expression is said to be 'explicitly defined', the expression may always be eliminated from any context in which it occurs, since it can be replaced by the defining expression without altering the sense of the context." (Nagel, 1979: 97)

Clearly, however, this is not the case when one is dealing with the groups literature; when Tajfel refers to groups one cannot substitute, for example, Bales' definition of group without altering the sense of what Tajfel is saying, and vice versa.

To this extent most of the competing definitions of group are not definitions at all. That is to say, they do not have universal applicability. More important, however, is the suspicion that they are not <u>intended</u> to have universal applicability. What differences there are amongst writers appear to be principally concerned with degrees and differences of emphasis, and, with one or two exceptions (see for instance De Lamater, 1974), there is little evidence that writers have attempted to construct definitions that have any reference outside their own narrow range of interests. Most of the effort towards definition has been in the interests of what will be referred to later as "boundary setting". Nevertheless, the ambiguity of the word "definition" has led to numerous fruitless discussions about the adequacy or otherwise of different definitions (e.g. Berkowitz, 1980; De Lamater, 1974; Turner & Giles, 1981).

3. DEFINING, CATEGORISATION AND BOUNDARY SETTING.

> "Because of the multiplicity of properties of groups, it is difficult to formulate a definition of <u>group</u> that encompasses the full variety of groups

> encountered in society and still provides a clear distinction between those social entities to be called groups and those to be given some other name." (Cartwright & Zander, 1968: 45)

All attempts to define 'group' are essentially attempts to solve the problem of categorisation, that is the sorting of phenomena and objects into <u>useful</u> pigeon holes, which set them apart from other phenomena. In short, defining is a <u>pragmatic</u> enterprise.

In this respect the conclusions of cognitive and social psychologists working in categorisation research are of some importance (Johnson-Laird & Wason, 1977; Sokal, 1977). These strongly suggest that category systems, more specifically the boundaries which define categories, are arbitrary, and that any fixed rule system for categorising objects will sooner or later be rendered inadequate (Barsalou, 1983, 1987; Bechtel, 1988; Condor, 1987; Rosch, 1975; 1977; Rosch et al., 1976; Sokal, 1977). They are not, of course, arbitrary in the sense that they are random, but in the sense that the boundary criteria which are deployed necessarily constitute merely a subset of the incalculably many criteria that <u>may</u> be employed. Wittgenstein's famous remarks about the concept "game", describe the situation very well:

> "Consider, for example, the proceedings that we call 'games'. I mean board-games, card-games, ball-games, Olympic games, and so on. What is common to them all? - Don't say: "There <u>must</u> be something common, or they would not be called 'games' - but <u>look and see</u> whether there is anything common to all. - For if you look at them you will see not something that is common to all, but similarities, relationships, and a whole series of them at that ... Look for example at board-games with their multifarious relationships. Now pass to card-games; here you may find many correspondences with the first group, but many common features drop out, and others appear. ... we can go through the many, many other groups of games

> in the same way; we can see how similarities crop up and disappear. ... we see a complicated network of similarities overlapping and criss-crossing: sometimes overall similarities, sometimes similarities of detail. ... I can think of no better expression to characterise these similarities than 'family resemblances' ... And I shall say: 'games' form a family." (Wittgenstein, 1958: 31e - 32e; paras 66-67).

Since there is a strong case for suggesting that even static objects cannot be adequately categorised with coherence in such a way as to cover all potential circumstances (Rosch, 1975, 1977; Rosch et al., 1976; Rosch & Lloyd, 1978), a similar situation must obtain, a fortiori, for dynamic social phenomena like groups (Waddington, 1977). The point is that the term 'group', like 'game', may also be usefully treated as a "family name". The same point was made by Margolis (1982) about the related term 'organisation'. What it amounts to is accepting the assumption that the general concept 'group' is indefinable; that it is an 'open concept', rather in the manner of G. E. Moore's "open question arguments" (Moore, 1903. See also Lacey, 1976: 140).

The suggestion is, therefore, that it is not possible to define the term group in such a way as to cover all and only those situations in which it can be used. Note that this is an assumption, not a demonstrated 'fact', but it is nevertheless a plausible extension of the documented difficulties of definition (Cartwright & Zander, 1968; Douglas, 1983; Gibb, 1969; Sprott, 1958). If this assumption is correct, then it follows that attempts to define group once and for all will be fruitless.

4: INTRODUCTION TO THE BOUNDARY SETTING APPROACH.

It might appear that such a view is a counsel of despair, but it is not. On the contrary, accepting the conclusion represents a simplifying step that can help in the construction of a unifying framework. It is not the intention of this thesis to present such a framework in detail, but what follows is a tentatively sketched first step.

The approach referred to earlier as 'boundary setting' is an alternative way of approaching the problem of definition which allows phenomena to be closely specified, when necessary, without requiring that the distinctions thus drawn be thought of, and consequently defended as, rigid and exclusive category divisions. It is an approach that has been used with some success by systems theorists, and those influenced by systems thinking (see for instance Beer, 1962, 1972; Emery, 1981; Espejo, 1983; Waddington, 1977), and although not new, it is a view which is starting to become influential in a wide range of scientific and philosophical enquiries (see, for example, Bateson, 1979; Bohm, 1983; Capra, 1975, 1982; Condor, 1987; Gardner, 1982; Haack, 1978; Harré, 1984; Lovelock, 1979; Poundstone, 1985; Prigogine & Stengers, 1984; Sheldrake, 1981; Sokal, 1977; Zukav, 1980).

The starting point for this approach is acceptance of the basic proposition that boundary closures, that is category divisions, are arbitrary. This does not mean denying the necessity for some sort of boundary closures around phenomena, for the purpose of study. As commentators as widely disparate as the authors of the I Ching (H. Wilhelm, 1961; R. Wilhelm, 1968) and Tajfel (1984) have

observed, boundaries must be set if we are to avoid being swamped by the boundless complexity of what we study. But, it is submitted, it is a mistake to believe that they can, or indeed must, be set in any absolute way. As Bateson puts it:

> "The division of the universe into parts and wholes is convenient and may be necessary, but no necessity determines how it shall be done." (Bateson, 1979: 47)

Recognising both the desirability of setting limits, and the absence of an independent universal necessity determining where they are to be set, the question arises of what it is that justifies the choice of boundaries and where they are set. It is suggested here that such limits are pragmatically driven. That is to say, that they are determined by the practical needs, theoretical or empirical, for which they are to be deployed, and consist of a specification not only of what is relevant, but to some extent, also what is not relevant, to those needs. Gibb (1958, 1969 b) makes a similar point using the example of a tennis doubles match. For some purposes the players might be considered as a unitary interdependent group, but for others as two groups competitively opposed to one another.

Even with the constraints of these assumptions, it is suggested, however, that particular manifestations of 'group' can be fairly precisely delimited according to their attributes; to quote Wittgenstein again:

> "It is as if someone were to say: "A game consists in moving objects about on a surface according to certain rules ..." - and we replied: You seem to be thinking of board games, but there are others. You can make your definition correct by expressly restricting it to those games." (Wittgenstein, 1958: 3e; para 3)

This is not to suggest that by giving them a different name hard and fast definitions can be smuggled in through the back door, so to speak. It is necessary to recognise that in so 'defining' a group, or range of groups, boundary closure has been artificially imposed, and such closures are, necessarily, no more than methodological ploys aimed at reducing the undeniable complexity of the objects or processes under study, much as 'schemata' (Neisser, 1976) or 'scripts' (Schank & Abelson, 1977) are thought to operate in perceptual processes. This is not to trivialise the process of boundary setting. On the contrary, it cannot be emphasised too much that, as indicated earlier, **boundaries are essential**.

It must also be emphasised once again that any boundaries adopted are necessarily arbitrary (Douglas, 1983) in the sense given earlier, and ultimately the choice of what constitutes the boundaries will rest on the purposes for which they are needed. Nevertheless, although arbitrariness is the rule rather than the exception, it carries with it a responsibility on the part of the researcher to be as clear as possible which criteria are to be used, which excluded, and why. As Lasswell and Kaplan point out, in their discussion of analogous problems associated with social power, it is unimportant whether different researchers use key terms to mean different things (Zander, 1979) as long as they maintain a level of:

> "... self-consistency, and clarity sufficient to make translation and empirical reference always possible." (Lasswell & Kaplan, 1950: x)

5. THE BOUNDARIES ARE FUZZY.

One important feature of the approach advocated here is the notion of 'fuzzy boundaries', an idea which is making headway even in areas as rigorously formal as logic and related fields (Bohm, 1983; Haack, 1978; Hawking, 1988; Quine, 1980), but which seems to be absent from much of social thinking (see for instance, Mitchell, 1982). It is important, amongst other things, for the implications it has in debates about the validity of research methods and results.

As applied to the problem of defining 'group', the proposition is that there is no clearly divinable cut-off between 'groups' and related social phenomena such as aggregates or organisations. This proposition has several distinct meanings. In one sense it follows directly from what has been said before; that is, if there is no independent necessity driving the placing of boundaries around the concept group, then similarly there can be no such necessity for placing the boundaries around adjacent concepts such as aggregate or organisation. From it emerges the proposition that once the boundaries of group are established, then, at least partially, the boundaries around adjacent concepts are also established, most particularly at the point where they are thought to have a common border, so to speak.

This is a methodological sense of the term 'fuzzy boundary'. There is, however, a second distinct sense which carries with it implications for the <u>conceptual</u> understanding of the relationship between groups and those social phenomena referred to by adjacent terms.

In this second sense the idea of fuzzy boundaries amounts to the proposition that there is no <u>de facto</u> psychological boundary between groups and related social phenomena. That is to say, the proposition asserts that, for example, an aggregate, however conceptualised, can <u>develop and change</u> to become a group, again, in whatever sense the term might be considered. In other words, whatever boundary there may be, in the abstract, between groups and aggregates, can be penetrated; it is a permeable barrier which allows movement backwards and forwards. In short, as it is conceived here it is a proposition of 'degrees of groupness' (Cartwright & Zander, 1968b; Douglas, 1983; Hare, 1976, 1982).

It is important to note that the difference between the two senses of 'fuzzy boundary' is that between physical and quasi-physical boundaries, that is to say, roughly, observable boundaries, and social psychological boundaries, which are by and large more inferential than observable. Unlike **<u>physical</u>** structures, **<u>social</u>** structures can only be observed in their functioning. This points to the two quite distinct purposes behind defining mentioned earlier, and which are discussed later in relation to group dimensions.

Although the degrees of groupness thesis is a widely held view (see for instance Cartwright & Zander, 1968; De Lamater, 1974; Douglas, 1983; Hare, 1976, 1982; Newcomb et al, 1966; Shalinsky, 1983), it is nevertheless important since it directs attention, amongst other things, to <u>processes</u> within groups as opposed to their mere physical attributes. It is, in short, an implicitly time-based view which challenges the temptation to regard groups

as static reified objects. Indeed, it presents an implicit critique of such approaches. It is a process based view, which regards groups in terms of dynamic, interrelated processes. Note, however, that the permeability of boundaries understood in this way, is a proposition about change and development within groups qua groups. It has nothing to say about the ease, or lack of it, with which new members may join the group, which is an entirely different sense of the term permeability.

As noted earlier this sort of approach raises important issues about what social and psychological criteria, as opposed to physical criteria, help to distinguish groups. This in turn has implications for the analysis and interpretation of research results. For example, when considering Bales' results with respect to what he called 'low status consensus' groups (Bales, 1958; Bales & Slater, 1955), the question arises as to whether such groups are really groups at all (see chapter 6, section 6 below).

The approach advocated here, then, represents a release from the odium of having to define 'group' once and for all. The shift away from defining 'group' towards the explicit setting of methodologically determined boundaries represents a shift away from ostensive towards stipulative defining, or, in the terms of Knoke and Kuklinski (1982), from "realist" to "nominalist" boundary specification. In other words, it is a move away from trying to list all the attributes of all and any groups that may be "out there" towards a stipulation of the attributes of the type of group that forms the focus of interest. It is, in this sense, a conceptually driven approach.

6: THE DIMENSIONS OF GROUP.

The purpose of this section is to identify some of the dimensions along which groups, or definitions of groups, vary using those "attributes that have impressed various theorists as being especially important features of groups" (Cartwright & Zander, 1968: 48). There exist within the literature several lists of such features, usually of five or six items, abstracted by their authors from the wider literature (Cartwright & Zander, 1968; De Lamater, 1974; Hare, 1976; Shaw, 1976; Shalinsky, 1983; Wilson, 1978). These, with supplementary material drawn from other sources (e.g. Newcomb et al., 1966) form the basis of the list of dimensions given below in table 3.1.

One impressive feature of these lists worth noting, given the gloominess prevalent in the literature, is the evident and substantial agreement that exists between them as to what are the significant aspects of groups. But this is partly to be explained by the fact that, with the possible exception of Cartwright and Zander's list, they are all restricted in their scope to face-to-face groups, whether explicitly (Shaw, 1976), or implicitly (De Lamater, 1974). Despite this restriction, however, which in fact presents no real problems for present purposes any way, the lists provide a valuable initial resource which can easily be supplemented from other sources. On that basis the principal themes which occupy group theorists, and which therefore constitute group dimensions as here conceived, seem to be fairly concisely covered by the broad headings listed in table 3.1.

Table 3.1: A list of group dimensions.

1) Size
2) Time
3) Interaction
4) External definition
5) Independence
6) Proximity of membership
7) Openness of membership
8) Goals
9) Norms
10) Structures
11) Cohesion
12) Interdependence

Lists like that in the table above, are variously referred to in the literature as of group characteristics (e.g. Cartwright & Zander, 1968b), group attributes (e.g. Hare, 1976) and group dimensions (Cattell, 1953. See also Douglas, 1983). The term 'dimensions' has been adopted here, for quite specific reasons. It has been deliberately chosen to convey the sense that the items within the list, when considered as part of a general list of group dimensions, are to be conceived of as continua and not as digital all-or-none factors. That is to say, any particular instance of a group may be considered as having a strength or intensity of a specified dimension somewhere on a notional continuous scale running from nothing upwards (Douglas, 1983). This is consistent with the 'degrees of groupness' thesis presented earlier.

The term 'attribute', which is also used here, is more properly thought of in specific terms. For example, in general all groups, however conceived, may be considered in relation to the dimension 'size'; they are all of some size. In any particular case of a group, or class of groups, however, the size might be restricted, for whatever reasons, to a range of, say, between 2 and 10. Thus,

it is an attribute of that group, or class of groups, that they have a size of between 2 and 10 members.

Returning to the list above, there are some important points to be made. First, it must be emphasised that it is offered tentatively. As noted earlier, other authors, for their own particular purposes, may focus on different dimensions.

Second, in one important respect the items in the list, as a general list, are without content. That is to say, they have no specific meanings assigned a priori. This is consistent with what has been argued earlier, and it simply points to the principle that the headings are open to interpretation, depending on the context and purposes for which they are deployed. Consider, for example, the dimension 'independence', which for some purposes might simply mean autonomy, in the sense in which it is usually employed in the organisational behaviour literature when referring to autonomous working groups (e.g. Galbraith, 1974). In other contexts it might more appropriately refer to the convening of the group by the group's members, for their own purposes, as opposed to being convened by some extragroup authority (e.g. Simon, 1980). The reason for drawing attention to this is recognition of Zander's point that different authors frequently use different terms to refer to what are substantially the same things, and more importantly, often use the same terms to refer to different things (Zander, 1979). It follows that when using terms such as those in the list, some care must be exercised in explaining what meanings are being assigned, and which meanings are not considered relevant (Lasswell & Kaplan, 1950).

Third, it has not been possible to present a list of mutually exclusive factors, partly because of the different meanings which could be assigned to each of the headings, and partly because the factors themselves are not conceptually distinct. For example, cohesion can be understood as an empirical function of interpersonal affiliative ties (Cooley, 1929) or conversely interpersonal affiliative ties can be understood as an empirical function of cohesion (Burnstein, 1969). On the other hand, positive interpersonal affiliations can be understood conceptually as part of what cohesion means (Theodorson, 1957). Thus once more this points to the necessity for clear analysis of what key terms are taken to mean within a particular context.

Finally, it will be noted that the terms are ordered, broadly speaking, in terms of their 'observability'; at the head of the list are features which are, so to speak, relatively easily 'measured', while those at the foot are more inferential. The ordering is not important, but the distinction is, since it points to the two quite distinct functions of 'defining' mentioned earlier; defining in terms of physical or quasi-physical attributes, and defining in terms of social and psychological attributes.

7. OBSERVABLE AND INFERENTIAL ATTRIBUTES.

Here the two different functions of defining will be considered more fully. The first aspect is concerned with delimiting a range or class of social phenomena to be studied in terms of their physical or quasi-physical features, such as size, proximity of members to one another, formally defined structures, and so on.

The second aspect deals with establishing, or identifying, the social and psychological features by which a group is to be distinguished from other social entities with similar physical features. That is to say, it is the attempt to identify, or specify, the constituents of the "metaphysical glue" which binds a group together; that which defines 'groupness'. These are largely inferential features, such as networks of affiliative ties, cohesiveness, and emergent structures.

In terms of this distinction, the definition of group given by Bales (1950; see section 2), since it is essentially concerned with delimiting physical features, is a definition of observable attributes. On the other hand, a definition such as the one offered by Hare (Hare, 1976: 5), based on the work of Znaniecki (1939) and Sherif (1954), is primarily a definition of inferential attributes, since it attempts to describe the conditions under which a group is a group, as opposed to something else, such as a mere aggregate or collection. There do exist definitions which deal with both aspects of groups, but by and large most are restricted to one or the other. Nevertheless, almost without exception there is no clear distinction made between the different aspects of defining, and the result is inevitably muddle.

Definitions, or boundary specifications, that are couched in terms of physical attributes, set the empirical context within which the study is to take place. Boundaries set in this way may be used to draw the physical distinction between groups, and related phenomena such as 'organisations', 'cadres', 'cliques', sub-groups, and so on. They do not draw the distinction between groups and aggreg-

ates since this last distinction is primarily a matter of qualitative, not physical, difference.

The distinction between aggregates and groups is principally inferential, to the extent that it is a quality of psychological process. For example, two collections of people might well share the same physical attributes, such as number of members, location, and so on. But in one case it could be that the group members are simply co-acting, as Fiedler (1964) puts it, with little or no sense of shared purpose, no particular commitment to the group and other members, and so on. On the other hand, the second collection might have a very strong shared sense of belonging to a group, with a strong sense of 'we-ness' (Cooley, 1929). In short the second collection would be characterised as having that nebulous quality 'cohesiveness'. In social psychological terms the two collections are quite different, and in the terms which are to be adopted here the first would be little more than an aggregate of people, and only the second a 'group'.

Thus, boundary setting, properly speaking, involves at least two aspects; boundary specification in terms of physical attributes and psychological attributes, using the so-called 'higher-order' inferential concepts. The last aspect is of particular importance where the study aims to chart development from aggregate to group, as, for example, in Bales' earlier studies (Bales, 1953 a).

8: FOCUSSING DOWN.

In the light of what has been said so far about groups and boundary setting, this section outlines the boundaries of 'group' as it

is to be employed in the thesis. The discussion is in two parts, related to the two functions of defining described earlier.

The first part deals with the physical attributes of the types of groups to be studied. The second part deals with the more inferential social psychological aspects. It will be argued that a collection of people can be identified as a group only if group members perceive a sense of some order with respect to the group and its activities. Specifically there must be a shared sense of social order within the group (Hosking, 1988).

9: PHYSICAL ASPECTS.

Conventionally enough, the physical description of the groups to be studied is adequately covered by Bales' (1950) definition quoted earlier (section 2). That is to say, the thesis is concerned with the sorts of groups which form the staple of the small groups tradition; the small face-to-face discussion group (Bales, 1950 a & b, 1958, 1970; Bales et al., 1979; Bass, 1960; Cartwright & Zander, 1968b; Douglas, 1983; Gibb, 1969 a & b; Hare, 1976, 1982; and so on).

What this amounts to is that a potential group consists of, conventionally, between two and twenty members (Shaw, 1976), gathered together in one place, at one time, and undertaking a task, usually a discussion task, which requires co-ordinated interdependent activity for its accomplishment (Burke, 1972).

As a general physical description of certain kinds of group this

characterisation is fine for present purposes. The restriction to face-to-face interaction presents no problems, even though interaction need not be so restricted, because the kinds of groups discussed in chapter 1 were primarily face-to-face groups, as are a large number of other so-called 'real world' groups, such as juries, industrial project groups, small pressure groups when convened for meetings, and so on.

For purely practical reasons, the upper limit on size is being set at eight members, although it is worth recalling that it is now fairly well established that the optimum size for small face-to-face groups is around five (Hackman & Vidmar, 1970; Kephart, 1950) or six members (Slater, 1958). That is because at this size the group is small enough to allow everyone in it to be heard, if they want to be, and yet large enough to allow a diversity of opinion (Napier & Gershenfeld, 1981: 45), opinions which found some echo in the 'alternative literatures' on organising (e.g. Jelfs, undated). It is interesting to note in passing how similar this figure is is to Miller's "magical number 7 plus or minus 2" (Miller, 1956).

The lower limit of two members is, however, here felt to be too low. There are two main reasons for saying this. First, it is argued by some that there are fundamental differences between diads and triads on the one hand, and situations involving four or more people on the other (see Hare, 1976). For example, the opportunities for intimacy are vastly enhanced when there are only two people than when there are more. As Bion (1961) puts it:

> "The minimum size of group is three. Two members have personal relationships; with three or more

> there is a change of quality (interpersonal relationship)." (Bion, 1961: 26).

The saying "two's company; three's a crowd" captures, if nothing else, the difference in phenomenological experience of being in either of the situations (see Hare, 1976: 214 et seq., for a more detailed discussion of the differences).

The second reason is rather more pertinent to the focus of the thesis. It has already been indicated that the thesis is concerned with the emergence of structure within groups, and in particular the development of role differentiation, understood as the emergence of separate task and social specialists (Bales, 1958. See chapter 2). There would seem to be little point in looking for such a structure when only two people are involved in the interactions, and the situation is only marginally better with three. This would suggest that a minimum number of members needed is no less than four.

Thus, it will be stipulated here that for the purposes of this thesis, a group, or rather potential group, will comprise of no less than four members, and, as a matter of expediency, no more than eight.

10: SOCIAL PSYCHOLOGICAL ASPECTS.

One of the objections raised against Bales' definition of groups is that it offers no way of distinguishing between such intuitively ungroup-like phenomena as bus queues, and "groups proper" (e.g. De Lamater, 1974). Indeed, until Burke (1972) imported the stipulation about interdependence, this was fair comment, and it

points to the need, stressed several times, to establish some clear idea of what it is that distinguishes a 'group' from a social phenomenon which has similar physical properties, but which in some way isn't a group.

The literature is full of attempts at doing just that. Suggestions range from minimalist solutions which allow everything from basic social facilitation type scenarios, through bus queues to 'fully-fledged groups' to be included under the term 'group' (Berkowitz, 1980. See section 2 earlier), to the rather more elaborate attempts, such as those offered by Hare (1982). It has to be admitted, however, that the problem remains, and all solutions are to some extent controversial. This is undoubtedly related to the problems of definition described earlier in the chapter; much more than with definitions in terms of physical attributes, definitions which aim at explicating the metaphysical glue of groups are a function of the interests of the person creating the definition.

Characterisations of 'real' groups, as opposed to 'aggregates', or similarly 'ungroupy' phenomena, have by and large proceeded 'intuitively', much in the manner of Cooley's (1929) vague sense of 'we-ness' or Bion's (1961) "good group spirit". As Bion comments:

> "It is as hard to define as is the concept of good health in an individual." (Bion, 1961: 25).

Nevertheless, there have been several influential attempts to define it, including Bion's own definition, some of the lists mentioned earlier, and many others. The 'ingredients', of course, vary, although by no means to the extent that the definitions necessarily conflict. This was the point made earlier about there

being less discontinuity in the field than it appears.

Solutions to the problem include the suggestion that 'groups' have shared goals (Mitchell, 1982); are characterised by patterns of interpersonal attractions (Hare, 1976, 1982); develop clear structures, usually in the sense of division of labour (Hare, 1982); develop norms (Newcomb, 1953; Sherif, 1967); or simply develop a strong sense of group identity (Sherif, 1936, 1951, 1957, 1958, 1967; Sherif & Sherif, 1953). Deutsch (1968) has suggested that 'groups' have unity to the extent that they are seen to have, by their members, what he calls "promotively interdependent goals", as opposed to "contriently interdependent goals". That is to say, in Fiedler's terms, that they are interacting groups, as opposed to counteracting groups (Fiedler, 1967), within which the various goals pursued by group members do not result in closed or zero-sum competition (Handy, 1985), that is to say win or lose situations.

Factors such as group norms, perceived interdependence of goals, co-ordination of activity, and so on, can all be neatly and succinctly subsumed under the rubric "social order" (Goffman, 1959; Hosking, 1988; Kelvin, 1970), which is one of the so-called "higher order concepts" (Hosking & Morley, 1983). The suggestion is that for a collection of people to be properly called a group, the members must have a sense of some order within the group, reflected in **action** and **cognition**, and also a sense that it is shared by the other members. The concept "group" really only makes sense in the context of dynamic interpersonal processes.

Understood in this way social order is a shared sense of understanding about how things are done, what things are done, who does them, and why. This is what constitutes "psychological reality" in a group as opposed to an aggregate. That is to say, a shared sense of social order within a group is what constitutes its unity (Deutsch, 1968; Hosking, 1988; Hosking & Morley, 1983; Morley & Hosking, 1986). It follows, therefore, that there must be a minimum level of agreement, tacit, or otherwise, on critical areas which are salient for the group and its members, including and especially central values and status orders.

Note that this formulation does not stipulate what form the social order should take. It is simply a statement that for a group to be a 'group proper', there should be some kind of social order; that is to say, some form of shared group reality. Thus, for example, in some groups social order might be partially manifested in the emergence of relatively fixed and reified hierarchical structures and division of labour, whereas in others it might manifest in flexible shifting structures relative to the job in hand, what Herbst (1976) calls multistructured functioning.

The discussion in chapter 2 relating to the achievement of group goals without domination attempts by group members, is one aspect of the social order arguments relating to the politics of organising (Brown & Hosking, 1984). Therefore, some take the view that values relating to how things are achieved by the group is as important as that they are achieved (Brown & Hosking, 1984; MacGregor-Burns, 1978). Similarly, Bales' ideas about resolutions to the equilibrium problem (Bales, 1956; 1958; Bales & Slater, 1955)

can be seen as one aspect of establishing and maintaining sufficient social order for the group to achieve its goals and survive with some measure of cohesion (See chapter 2). The behavioural separation of task and social specialists, if it occurs, is one structural manifestation of social order. It must be emphasised, however, that there must be some measure of consensus about who does what, and some recognition (at some level) among the participants that this is an area of intersubjective understanding and agreement. In relation to the role differentiation propositions this means agreement, again tacit or otherwise, about who is task specialist and who is social specialist, although not necessarily recognised in these terms.

More generally, structures do not exist within a group unless a significant proportion of the membership agrees that they exist, and know that they do so. That is not to say that all members must agree absolutely on all points, but to some substantial level there must exist a shared social reality within the group, or at the very least a set of compatible realities, and some understanding amongst the members of how they relate to that reality.

It should not be assumed from this that social order is conceived in some sort of reified manner. The view taken here, and indeed the only view consistent with a social order perspective, is that the shared reality within the group is subject to a dynamic balance between stability and change, through the process of negotiation between group members, whether tacit or explicit. It is a process based view entirely consistent with the degrees of groupness thesis presented earlier. Reality, that is to say, is const-

antly created and recreated during social interaction within the context of existing evaluation and agreement with regard to social order. Any summary of such reality is therefore little more than a snapshot taken from an ongoing flux. As Democritus put it, you never step into the same river twice.

It has been said that such a view of social life paints a picture of implausible harmony, and neglects the important adverserial facets of social life, such as manifest inequalities in social power and the tactics sometimes adopted by persons and groups with vested interests to gain or maintain power. The counter position, argued by Dahrendorf (1959) for example, emphasises conflict of interests between persons, called by Shotter 'conflicted realities' (Shotter, 1986, 1987, a, b, c).

It is true that if carelessly stated the negotiated order perspective can give this impression. But it is not inevitable that the term 'negotiated order' necessarily must imply <u>implausible</u> harmony in social life. It is precisely between parties with differing views that negotiation takes place. What is important to the negotiated order perspective is that <u>agreements</u> are reached, first with respect to acceptable definitions of reality, and second with regard to recipes for action based on those definitions. In this way, all parties can manage their interdependencies. If a collection of people manifests high levels of debilitating conflict over an extended period, then either they do not constitute a group, by the criteria described earlier, or they are a group in crisis, and if the crisis remains unresolved the group is likely to disintegrate (Bales, 1953; Bion, 1961).

To explain, in the first case, if the individuals are more or less permanently conflicted, then, by definition, there is no shared sense of social order; there is no shared reality or compatibility of different realities. Therefore, by definition, there is no a group. In the second case, competing realities not brought into compatibility will undermine the group's stability and unity, generating instead uncertainty. If conflict is acrimonious and protracted then the group will soon lose its shared sense of social order, broadly understood, and is likely, therefore, to disintegrate altogether, or split into one or more smaller groups, as occured with monotonous regularity amongst alternative movement groups (see chapter 1).

This would suggest that neither the conflicted realities view, nor an exclusive emphasis on agreement and social order, provides an exhaustive account of social relations. What is important is the <u>balance</u> of stability and harmony, and how that balance is achieved and maintained. Thus, the view presented here is that the unity of a group is reflected in the members' shared sense of social order. This sort of view has considerable implications for the study and understanding of leadership, and will be discussed in greater detail in the next chapter.

11. SUMMARY OF CHAPTER 3.

It has been suggested that the multiplicity of definitions of 'group' in the literature, and the lack of a generally agreed definition, do not represent any serious discontinuities in the field. Rather these reflect not only the actual complexity of the

subject matter, but also the diversity of interests of those working in the field. It was argued that 'group' is an open-ended concept; that it is not possible to construct a general definition that will adequately cover all and only those phenomena that can be called groups. In the light of this, it was suggested that a pragmatic process called boundary setting, using a dimensional approach to groups, presents a better alternative to the traditional construction of definitions, shifting the emphasis away from defining 'group' as a general concept towards the explicit setting of pragmatic boundaries; a shift from ostensive to stipulative defining. It was emphasised that such boundaries must be recognised to be essentially arbitrary methodological fictions, but **absolutely essential** nevertheless.

The discussion indicated that 'defining' has two separable functions, and it was argued that they must be kept separate. First that the boundaries may be set up in terms of the physical attributes and criteria of a range of social phenomena which constitute groups, or potential groups, for the purposes of study. Second, the description of the social psychological attributes and criteria which distinguish these social phenomena as groups from mere aggregates.

Throughout the chapter, the **relative** nature of all key terms was emphasised, and it was argued that the fixing of the meanings of these terms is a function of pragmatic context, that is, the use to which they are to be put.

In the light of these discussions about boundary setting, the

boundaries of 'group' as understood within the context of this thesis, were set. First it was indicated that the physical attributes of groups were adequately covered by Bales' (1950) definition, although size parameters were stipulated to be between four and eight members. The lower number was set because anything less was considered to be too small to test the role differentiation hypotheses, and the upper limit purely for practical reasons.

The final section discussed the factors which characterise a group as opposed to an aggregate. It was argued that a 'group' is characterised by a shared sense of social order amongst its members. That is to say a shared understanding of what is done, how it is done, who does it and why it is done. This, it was argued, is a process view of groups which is consistent with the view that aggregates can develop into groups. In this last sense, aggregates become groups as they develop a shared sense of social order.

CHAPTER 4: ON LEADERSHIP.

1. INTRODUCTION.

One of the greatest problems of conducting social research is that many of the key concepts and terms are what might be called 'ordinary language' terms (Calder, 1977; Margolis, 1982). It might therefore be supposed that the job of the social scientist is relatively easy; after all, if he or she is using terms which are the currency of ordinary discourse, then there ought to be few problems in communicating ideas. It is not an especially clever observation to note, however, that the ways in which social scientists use terms are often far removed from ordinary language usage, and, as Margolis (1982) notes, the assumption that the reader shares the same interpretation as the writer is frequently liable to be wrong. Nowhere is this more apparent than in the study of leadership.

On the one hand leadership is a perfectly ordinary word, the meaning of which everyone believes he or she knows (Kelvin, 1970: 205). And yet, even in ordinary use, it is a term which evokes conflicting interpretations, and as an ideological issue it can even excite strong emotional conflict (see for example, Freeman, 1970 and Levine, 1974 - see chapter 1). There is, as Carwright and Zander (1953 b) observe, "little consensus about what leadership

is or what it should be", and furthermore, as Stogdill (1974) notes:

> "[there] are almost as many definitions of leadership as there are persons who have attempted to define the concept." (Stogdill, 1974: 7).

Unlike the groups literature, where, it was argued earlier, disagreements are more apparent than real, there are genuine and probably unresolvable discontinuities in leadership studies. This has led some researchers and theorists to suggest that the concept is not useful and that it should therefore be abandoned in favour of other concepts (Miner, 1975). Others take a different view. Indeed House and Baetz (1979) have gone so far as to suggest that, contrary to most views, 'leadership' is not only a useful concept, but that in their view the empirical work adds up very well. Nevertheless the overwhelming impression given by the literature is of a badly integrated rag bag of odds and ends, with at best only one or two thematic ideas:

> "It is difficult to know what, if anything, has been convincingly demonstrated by replicated research. The endless accumulation of data has not produced an integrated understanding of leadership." (Stogdill, 1974: vii).

and as Quinn (1984) has noted more recently, the

> "... seemingly endless array of unconnected empirical investigations is bewildering as well as frustrating." (Quinn, 1984: 10)

Nevertheless, the view taken here is that the situation cannot be resolved by simply abandoning the term 'leadership'; at best that would be little more than a cosmetic change, leaving many, perhaps most, of the problems unresolved, and at worst it would only serve to exacerbate an already confusing situation by encouraging an undesirable proliferation of terms. As noted earlier, this last

point presents a recognisable problem in the groups literature, and there is no reason to suppose that it would be any better when dealing with leadership.

The problem resides not so much with the variety of uses to which the term is put, as with the lack of carefully circumscribed use, and overwhelmingly with the singular lack of attempts at theoretical integration (Brown & Hosking, 1984; Hosking, 1988; Hosking et al., (undated), 1984; Morley & Hosking, 1984). Such a situation has been aptly summarised by Shotter (1975) in relation to psychology as a whole:

> "... to possess a wealth of facts is not necessarily to have a richness of understanding. The explosion in our knowledge has resulted in an ever expanding array of disconnected and fragmented data lacking all conceptual unity - it has provided material appropriate perhaps for the building of a great edifice, but no hint of a plan for its construction." (Shotter, 1975: 15)

This chapter, then, will retain the term 'leadership'. But, if it is to be useful, it will have to be defined fairly closely, bearing in mind Lasswell and Kaplan's stricture quoted earlier (Lasswell & Kaplan, 1950). It is not intended that this chapter should present a comprehensive review of the leadership literature. With the existence of Stogdill's monumentally impressive Handbook of Leadership (Stogdill, 1974), and the more recent Bass update (Bass, 1981), such a review would be superfluous, and, as the size of the Handbook demonstrates, far beyond the scope of a single chapter.

The next section argues that if it is to be useful, and if the confusion typical of the literature is to be avoided, then the

term 'leadership' must be articulated with respect to a clearly stated theoretical stance. It is suggested that this is typically avoided in the literature, but that nevertheless theoretical positions are adopted implicitly.

Taking Hosking's distinction between 'the condition of being organised' and 'processes of organising' (e.g. Morley & Hosking, 1986), the next section of this chapter examines critically what are here called formal structural approaches to leadership. It is argued that these approaches, by defining leadership as something a leader has or does, do not present a social psychological view of leadership, and that far from studying leadership they study a contaminated set of control and power relations. It is argued that leadership is a negotiated relationship between persons not a simple function of position and status. This is followed by the presentation of an alternative view of leadership. It is suggested that discussions of leadership must be divorced from discussions of leaders if it is to be usefully understood. Leadership is characterised in terms of negotiated social order, the reduction of uncertainty, and the functional problems facing groups described in chapter 2. It is argued, with the use of historical examples, that leadership in all contexts is emergent, and that it can be adequately understood only in relation to values and choices about means and ends. Leadership, it is suggested, is the process of creating and maintaining social order within a group context, and that a major functional aspect is to bring disparate value systems into a working harmony. The chapter concludes by drawing explicit links with the characterisation of "group" given earlier, and with Bales' view of role differentiation.

2. ON THEORY.

It seems to be perfectly clear that the term 'leadership', as it is used, is less useful than it could be, simply because it is applied in a number of sometimes incompatible ways. As Hosking et al., suggest:

> "... the term leadership (like the terms leader and leadership effectiveness) has a variety of meanings which must be distinguished." (Hosking et al., (undated): 2)

In order to make such distinctions, however, there is a clear necessity for a more rigorous **conceptual** analysis than is apparent in the bulk of the literature. At the risk of making too sweeping, and too dismissive a claim, it seems that there is a tendency for workers in the field to pursue the minimum of conceptual analysis, preferring instead intuitively plausible, but ill worked out, operationalisations that seldom move beyond mere face validity.

The very process of operationalisation, however, implies a theory, however badly articulated. It is simply not possible to pursue research without being guided by some notions of what are reasonable strategies, what are interesting and sensible questions, and most important, some idea of what the key terms, whether conceptual or empirical, might mean (Chalmers, 1978; Feyerabend, 1975; Hudson, 1972; Kuhn, 1970; Lakatos & Musgrave, 1970; Nagel, 1979; Quine, 1980; Popper, 1972, 1979, 1980; Ryan, 1970).

Unfortunately, most of the theoretical stances within the leadership literatures are more implicit than otherwise, and frequently muddled. This is a direct consequence of the lack of theoretical

integration. Moreover, as it will be argued later, there is an important difference between theories about leaders (or more specifically leader behaviour) and theories about leadership, which is seldom addressed in the literature, the two often being confounded (Hosking, 1988). The difference is between those approaches which focus on what a person has or does as evidence of leadership, and approaches which conceive leadership as an interactive quality of relationships (Cartwright & Zander, 1953; Hosking & Morley, 1983). That is between those approaches which emphasise leaders (e.g. Fiedler, 1964; Mitchell, 1982; Wilson, 1978) and those which emphasise leadership (e.g. Gibb, 1947, 1958, 1969; Hollander, 1958, 1964, 1974; Hollander & Julian, 1970, 1978; Hosking, 1988; Hosking & Morley, 1983; Morley & Hosking, 1984, 1986; MacGregor-Burns, 1978).

3. LEADERS AND LEADERSHIP.

The relationship between the two terms 'leader' and 'leadership' is a difficult one, but there are two main approaches to it within the literature.

The first, and dominant, approach emphasises leaders; leadership is here synonymous with the term leader, and describes a personal quality. 'Leaders' in this tradition are identified a priori, usually on the basis of formal structural considerations, that is as persons occupying specified positions within a hierarchy (Gibb, 1958, 1969). It will be argued here that such approaches are essentially static, rely upon or assume dependencies rather than interdependencies, and confuse structure and process. Furthermore, because they conflate leadership with control they confound lead-

ership with extraneous political processes that are irrelevant to a proper understanding of leadership, and that they create needless confusion by insisting that leadership is something that leaders do, or worse **have**, in the absence of serious consideration of the part that so-called followers have to play (Hollander, 1964, 1970; Hollander & Julian, 1970, 1978; Hollander & Webb, 1955).

The second approach reverses the priority, and gives emphasis to **leadership as social process.** In this approach, leaders are identified a posteriori, as a result of examination of peoples' contributions to leadership processes. The advantage of such an approach is that it allows the potential identification of leaders within a social context in such a way that the affects of socio-political factors, such as formal structures, can be minimised in favour of social psychological factors. This approach necessarily demands serious attention to the conceptualisation of leadership processes and leaders.

4. FORMAL STRUCTURAL APPROACHES TO LEADERSHIP.

Formal structural approaches constitute one of the earliest foci for leadership studies. They are exemplified by the work of, for example Fiedler (e.g. 1964, 1967, 1968, 1974, 1978), Shartle, Stogdill and Campbell (1949), and more recently Staw and Ross (1980), Blake and Mouton (1964), Rees & Segal (1984) and Wilson (1978). As noted earlier, the hallmark of these approaches is that they equate 'leader' with specified positions within a formal structure, that is to say, structures with positions, roles and

status, and attendant functions, duties, rights and obligations defined by extragroup authority. In other words 'leader', by this view, is an extragroup appointment. These approaches focus on the condition of being organised (Hosking & Morley, 1985), and as such tend to ignore the processes by which that organisation is developed and maintained. They have dominated, indeed continue to dominate, the literature, despite a number of theoretical developments which might have been expected to alter the situation (see Cartwright & Zander, 1953b, 1960b; Gibb, 1947, 1954, 1958, 1969; Hollander, 1958, 1964, 1974; Hollander & Julian, 1970, 1978; Hollander & Webb, 1955; Hosking, 1988; Hunt et al., 1984; Morley & Hosking, 1984, 1986; MacGregor-Burns, 1978).

Such approaches take two forms, depending on whether studies are conducted in the field or the laboratory. In both situations, however, the assumption is that "whoever occupies a leader's office is leader" (Gibb, 1969: 20). In the former case it usually involves investigating those individuals with rank or status designations such as 'manager', 'supervisor', 'officer' and so on (Fiedler, 1964; Blake & Mouton, 1964; Stewart, 1963). In the latter case, usually with small laboratory groups, it involves the investigation of those individuals whom the investigator, or the group through prompting, has nominated as 'leader' (e.g. Gibb, 1950; Lewin, Lippitt & White, 1958).

It is in this sense that these types of study are static, because the relationships between actors are defined by a formalised structure **which remains fixed whatever the quality of dynamic, social psychological, processes that exist between them**; they

equate institutional power with leadership, but:

> "In principle, institutional power is exercised by, and with respect to, whosoever occupies the positions in question; the power relationship is, as it were, between positions rather than between persons." (Kelvin, 1970: 180).

It follows that within this tradition a lieutenant colonel, for example, is more of a leader than a sergeant. To this extent the terms 'leader' and 'leadership' are in point of fact redundant, merely duplicating under a single term information that is more richly available in the formal designations.

It is perhaps understandable that what are conventionally thought of as leader positions should be considered a good place to start, and convenient too. But convenient as it might be this approach has severe drawbacks from a methodological point of view:

> "... such a definition of the leader embraces so wide a variety of relationships as to be of little scientific value." (Gibb, 1969: 210).

This approach, by equating institutional power with leadership, legitimises the view that leadership is simply being in charge of a group (see, for representative examples, Drucker, 1955; Fiedler, 1964, 1967, 1978; Mitchell, 1982; House & Baetz, 1979; Stewart, 1963). That is to say, it equates leadership with supervision and control, or as Watson (1980) puts it 'command' (see also Brown, 1954; Dixon, 1979).

Without denying that formal structural factors can have an effect on psychological processes, it is clear that a simple equation of leadership with structure, in this sense, is itself not a psychological or social psychological proposition, but a political one, in the sense of organised polity. Such a view of leadership, while

no doubt pragmatically convenient, is both unhelpful and mistaken because, inevitably, it ignores the important part that the so-called "followers" or subordinates have to play in leadership phenomena (Hollander, 1964, 1974; Hollander & Webb, 1955) and tends to foster a view of leadership as unilateral dependence of the 'followers' on the leader. This can be seen most clearly in those studies that attempt to relate 'leadership style' with 'productivity' in small groups (Cherniss, 1980; Fiedler, 1964, 1968; Kaplan & Cowen, 1981; Likert, 1961; Lippitt & White, 1958).

The point of this line of argument is that 'leaders' as defined in formal structural terms may well owe their positions to factors other than psychological ones, such as luck, nepotism, incompetence or purchase. The formal structural approach does not allow any meaningful distinction to be made between such situations and those where positions are acquired through processes of interpersonal influence. Thus this approach conflates political processes of control with psychological processes of influence, and thereby limits from the outset potential understanding of leadership as a process.

If the term 'leader' is defined in formal structural terms, that is as role designation, then it follows that anything that so-designated 'leaders' do in their appointed role position counts as leader behaviour, or leadership. However, there is no good reason to suppose that the interpersonal behaviours of mere position holders are inevitably unique or special, and therefore by equating leadership with the behaviours of holders of specified positions within a hierarchy, leadership as a term inevitably covers

the entire gamut of human behaviour. This is the single, most compelling, reason why trait approaches to leadership inevitably failed, and why structural approaches require the superfluous concept 'leadership effectiveness' to explain how it is that some people seem to do a better job of 'being in charge' than others (e.g. Fiedler, 1964, 1968).

As a consequence there is no conceptual room left for leadership itself; there is 'good' (or effective) leadership, and there is 'bad' leadership, but the term leadership cannot be explained under this approach because it simply <u>is</u> what so-called 'leaders' <u>do</u>. That is to say, under the formal structural approach 'leadership', as a term in its own right, denotes an empty concept, a near synonym merely for 'behaviour', devoid of meaning unless qualified by an adjective. The incomprehensively long and disjointed lists of traits and behaviours which have been mustered within this tradition bear witness to the point (see Bass, 1981; Stogdill, 1974), and suggest that giving priority to leaders is perhaps not the best way to approach questions of leadership. Apart from anything else, the exigencies of Occam's Razor, or Canon's Principle of Parsimony, should lead one to reject this sort of approach.

5. LEADERSHIP AND HEADSHIP.

What has been said so far doesn't, of course, indicate that office holders are necessarily <u>not</u> involved in processes of leadership, but more importantly it has been suggested very strongly that there is nothing in the mere possession of a title which suggests

that they necessarily <u>are</u>. This of course raises questions about where the difference lies, and Gibb (1947, 1969) provides part of the answer with his distinction between leadership and headship.

This distinction has by and large been well received within the literature, despite dissident voices such as those of Cooper and McGaugh (1963), Janda (1960) and more recently Wilson (1978) and Adair (1983). The principal differentia, listed by Gibb (1947: 213, 1969: 212f), and more recently by Hosking et al (undated: 5ff), vary in some details, but the main points are:

a) Headship is maintained through a formally organised system, and not through the choice and consent of the group.

b) There is a unilateral choice of goals by the group head in line with his or her own needs and interests, and not those of the group.

c) There is little or no shared feeling or joint action in the pursuit of goals, or, in other words, headship entails some form of group alienation from its activities, thus implying that there is not really a group at all.

d) There is a wide social gap between the head and the group, which creates the conditions amenable to the use of coercion. That is to say, group heads are not really part of the group.

e) The sources of influence differ in the two cases; in headship it is derived from some extragroup power, whereas with leadership it is afforded by the group itself, and accepted because of perceived benefits in terms of values and interests.

As it stands this list, although useful, is not entirely adequate for present purposes. The main problem is that, as Jacobs (1970) has pointed out, Gibb has confounded structure (leader; head) and process (leadership; headship); some of the items are phrased in terms of individual leaders and heads, and some in terms of interpersonal relations and process. What the list does is describe a

quality of relationship between leaders (or heads) and followers, but in so doing it fails to move well enough beyond the proposition of leadership (or headship) understood in terms of position rather than process. Moreover, it leaves out of account the functional aspects of leadership, that is, it fails to address the question of what leadership is as opposed to how leaders and followers relate to one another. As a consequence it implies a simple hierarchy within the group, with the leader or head at the apex. It is unlikely that Gibb intended this implication, given his views on distributed leadership, and leadership as a group quality (Gibb, 1969: 215), but the net effect is still to give the overall impression that leadership is a matter of the behaviour of a single influential individual, and as such gives undue prominence to that individual tending to reinforce the impression of unilateral dependence. To this extent, the list remains within the formal structural approach to leadership.

Despite the difficulties presented by Gibb's list, however, it does nevertheless suggest some important aspects of the relationship and attendant processes denoted by the term leadership. These can be summarised conveniently by the following headings, with the relevant items from Gibb's list indicated in parentheses: choice and constraint (a, e); shared values (b, c, d); intersubjectivity and social order (b, c, d, e); and what Hosking (1988) calls acceptable influence (e). These will provide the themes for the following sections.

At this point, it should be emphasised that it is here thought to be important for discussion of leadership to be divorced from

discussion of leaders, although it is also the case that this is not always easy to achieve consistently. Nevertheless, the view taken here is that 'leadership' should be given priority, and that for the purposes of the thesis it is conceived in terms of social psychological processes of influence and functional contributions to group activities, rather than in terms of position (Cartwright & Zander, 1953b, 1960b; Gibb, 1969; Hosking, 1988). Position is here considered to be an outcome of leadership processes, not the determining factor. Specifically, **leaders are taken to be those who consistently achieve influence within a group, and are expected to do so** (Hosking & Morley, 1983; Kelvin, 1970). This is a crucial point, related to the important distinction between the static state of organisation and the dynamic processes of organising (Hosking, 1988).

As suggested in earlier chapters, the structures which emerge as a result of the processes of organising may turn out to be simple hierarchies, with a single leader at the apex of the triangle, but equally, and statistically more likely, the structure may be much more complex. Over emphasis on leaders, however, tends to create the implicit impression that the simply organised group (Bales, 1958) is the only viable structural form, and therefore, in effect, uncritically assumes the conclusion.

6. CHOICE AND CONSTRAINT.

Choice and constraint, as a theme, underlies two separable sets of issues. The first relates to the imposition of structure on the group (constraint), without regard to the values and aspirations of the group membership, and the second to processes of influence

argued here to be dependent on choice. These will be taken in turn.

It is quite clear that structures, hierarchical or otherwise, can be imposed on a group. That is to say, structures consisting of formally defined positions and roles, with attendant, similarly defined, functions, duties, rights and obligations. These are usually referred to as 'formal structures' (Buchanan & Huczynski, 1985; Gordon (1987); Mitchell, 1982). It is also clear that other structures, not necessarily consonant with the so-called formal structures, emerge during the course of group activity and interaction (Hare, 1976). These are usually referred to dismissively as 'informal' structures, with the attendant implication that they are somehow not 'real' or legitimate (see Mitchell, 1982, for an example). The difference between the two kinds of structure illustrates the different emphasis on choice and constraint, informal structures being based on the choice (intentional or otherwise) of participants.

By Gibb's formulation, the formal structures, in virtue of being imposed, do not constitute leadership structures. On the other hand, the so-called informal structures, emerging, it might be suggested, in response to the functional problems faced by the group (Bales, 1953 a) do constitute leadership structures because they are based on choice. But it is not that straightforward.

The point at issue is <u>choice</u>; choice in relation to <u>values</u>, and specifically, values about means, values about ends, and values about the relationship between means and ends (Brown & Hosking,

1984; MacGregor-Burns, 1978). To be sure formal structures are generally not made with reference to the values of the group, but it does not follow that simply because a structure has been imposed that it will not be fully acceptable to, and accepted by the group. Moreover, although imposed structures tend to be somewhat inflexible with respect to the changing needs of the group, they are not all totally inflexible (see Galbraith, 1971; Gordon, 1987; Handy, 1985; Herbst, 1976). On the other hand, emergent structures can ossify and become inflexible (Freeman, 1970; Levine, 1974).

The fundamental point is this, to the extent that structures, formal or otherwise, can be, and are, imposed and <u>maintained</u> without reference to the aspirations and values of the group, and in particular, perhaps in the face of opposition from the group, then these structures do not represent leadership structures. Thus, neither the imposition and maintenance of formal hierarchies, <u>nor</u> of less formal heterarchies, are examples of leadership structures if the group members are opposed to them. Better terms already available, particularly for formal structures, would be command or management structures.

The critical point is that <u>leadership</u> structures, hierarchical or otherwise, emerge through acceptance of influence. It is, of course, more than simply this, as will be demonstrated below, but it is of fundamental importance that the group has to feel that it has been able to choose, in some sense, the active values in relation to means, ends, and perhaps the relation between them (Brown & Hosking, 1984; MacGregor-Burns, 1978).

This, however, entails more than a simple choice about the adoption of structural form, or who fills specific positions; it is not a proposition about the election of leaders. It is a proposition about leadership understood as interpersonal process; a process in which structures of influence, liking, expectation, and so on, emerge. This is the second issue for which the theme of choice and constraint is relevant. The basic proposition is that leadership, as opposed to behavioural control, cannot be imposed on a group.

This suggestion is consistent with the view of leadership proffered by, amongst others, Dixon (1979), Gibb (1969), Hollander (1964), Hosking (1988) and MacGregor-Burns (1978). For example, MacGregor-Burns (1978) suggests that leadership is to do with engaging and directing the motivations and commitment of participants, and therefore, in common with all of the authors cited above, he insists that a particular kind of psychological response is necessary for a relation of leadership, as opposed to what Watson (1980) calls "command", to obtain. The point here is that while it may be possible to impose certain kinds of behaviour on a group, it is unlikely that the requisite psychological response can be created by fiat. The general idea is that where an individual or group has to be, or sees itself to be, forced to do something, then the relationship between the forcer and the forced is one of coerced compliance, not leadership (Bass, 1960; Douglas, 1983; Gibb, 1947, 1958, 1969; Kelvin, 1970).

By this view, leadership is characterised by the choice and commitment to act in accordance with recipes for action, thought or

ends which form the content of intended influence. Leadership entails, therefore, the engagement of opinions in favour of what is being done, how it is being done, and to what ends. In other words, it involves the engagement and mobilisation of values about means and values about ends (Brown & Hosking, 1984); what Mac Gregor-Burns (1978) refers to as modal values and end values. This means that the relationships are those of mutual positive interdependence; in terms proposed by Deutsch (1968), of promotive interdependence between all participants in a group, and not of unilateral dependence of followers on leaders (Gibb, 1969; Hollander, 1964; Hollander & Webb, 1955; MacGregor-Burns, 1978). In sum it is necessary to emphasise choice rather than constraint, with the implication that leadership involves processes of influence as opposed to coercion.

7. ACCEPTABLE INFLUENCE.

Processes of influence are closely related to processes of control (or coercion). The two are distinguished by the use or threat of sanctions, although as it will be seen later, there is nevertheless an overlap. This is a direct consequence of the critical part that values about means and ends have to play in the relationship. It must also be stressed that because the perceptions and evaluations of all participants are to be taken into account, the terms influence and control do not correspond directly with the terms leadership and headship respectively. It will be argued that the critical aspect of correspondence is related to, and can only be understood in terms of, shared values about means and ends (Brown & Hosking, 1984).

In the discussion that follows, the term 'power' will be used to refer to access to, and use of, sanctions, and is therefore closely allied to French and Raven's (1959) term coercive power, and Kelvin's (1970) term institutional power. This is not to ignore French and Raven's finer grained analysis of the bases of social power entirely, but it will be sufficient for present purposes. As Handy (1985) comments, the use of argument, persuasion, blandishments and so on, relate to attempted influence, whereas threats of sanction or punishment and the naked use of force relate to attempted control, that is to the use of power (see also Cartwright, 1959; French & Raven, 1959; Kelvin, 1970).

Very simply, then, and using the word 'persuasion' as a neutral term, the distinction between power and influence, as the terms are to be used here, is as follows:

> Attempts to influence, from the point of view of the source, involve attempts to persuade others to act, or think, in particular ways, and towards particular ends without reliance on the use or threat of sanctions. Attempts to control, on the other hand, rely predominantly on the use and threat of sanctions, over and above other methods of persuasion.
>
> From the point of view of the target, influence is characterised by perceptions of choice about whether to act or not, and specifically an understanding that there is a right to refuse. Situations of control are characterised by perceptions of threat or coercion, and therefore by feelings of unacceptable constraint with respect to action or the ends towards which action is directed.

In terms of this formulation, the significant thing about attempts to control behaviour is that they seek to restrict or eradicate the element of choice, specifically **the choice to refuse co-operation**, whereas attempts to influence do not. As A. J. Ayer

notes, constraint:

> "... appears to operate in two principal directions, either as limiting our power of translating our choices into acion or as limiting our power of choice itself." (Ayer, 1986: 5).

Attempts to influence are attempts to mobilise a positive psychological orientation in the target towards suggestions for means and ends (French & Raven, 1959), that is, **they address themselves in some way to the values of those to be influenced**. On the other hand, attempts to control are at the least simply attempts at generating mere behavioural compliance, and at the most attempts to generate a psychological orientation based on fear of the consequences of not co-operating. As a result, attempts to control or coerce tend to trivialise, ignore, or make irrelevant modal and end values held by those who are intended to comply.

There are three aspects of this formulation which must be emphasised. First, the term sanctions is not intended to be understood simply in terms of formal, institutional sanctions. It also covers psychological sanctions, and includes examples such as moral blackmail, the withholding of liking or approval, the threat of open disapproval, and so on. Both kinds of sanctions can be mobilised in attempts to control behaviour, and therefore coercion is not simply a function of formal institutional settings.

To the extent that all relations can be characterised, in simple terms, as providing some access to, or the potential threat of, sanctions, then all interpersonal relations can be characterised as power relations. Nevertheless, for present purposes the principal criteria of power relations are, first, the predominant use

of, or overt threat to use, sanctions, over and above alternative methods of persuasion, that is to say direct attempts to constrain, and second perceptions that the situation is characterised by the use or threat of sanctions, where such perceptions dominate the way in which the situation is construed. In other words, the principal differentium lies in the levels of perceived choice.

It follows, therefore, the the terms 'power' and 'influence' as here defined, denote the extreme points on a continuum, and that any given situation can be characterised as one more or less of influence or power. The importance of this is that most social situations, if not all, will have some elements of choice and coercion, perceived and actual, and therefore any specific influence attempts are unlikely to be fully accepted by all participants. In other words, it is unlikely that specific attempts to influence will be consonant with all the values with respect to means and ends of all participants, and therefore unlikely that they will generate fully committed behaviour from all participants.

This relates very well with the conceptual distinction, given by Sherif (1957), of latitudes of acceptance, indifference and rejection, and Barnard's 'zone of indifference' (Barnard, 1938). Actions in response to influence attempts may reflect a situation where the attempt has been accepted, or it may simply be that it hasn't been rejected, that is to say it hasn't been evaluated as unacceptable. Therefore, a criterion of leadership stipulating only accepted influence is too strong. A more useful criterion is that leadership involves acceptable influence, that is, influence

attempts which are deemed to be acceptable to the group in the circumstances (Hosking & Morley, 1985 a, b).

In terms of the analysis so far, to be acceptable, the suggestions for thought or action which form the content of the influence attempt, have to be consonant with values with respect to means and ends, that is to say, if not fully consistent with them, at least they cannot be inconsistent. Furthermore, the suggestions must be consonant, in the same sense, with the various **ends that participants bring to the group situation**, that is, if not fully facilitative of the achievement of ends, at least they should not hinder their achievement. In other words, influence is acceptable if there are perceived benefits in terms of values and interests (Brown & Hosking, 1984; Lortie-Lussier, 1987).

Second, the terms 'source' and 'target' of persuasion attempts are not intended as synonyms for 'leader' and 'follower'. As noted earlier the term 'leader' is taken to mean someone who consistently achieves influence over time, and is expected to do so. Nevertheless, as every member of the group is a potential source of influence (and also a potential source of threat) so every member is also a potential target, even if, admittedly, the potential is likely to be unevenly distributed. This is a simple restatement of the point about interdependency made earlier.

Third, although much of the discussion is couched in terms of attempts to persuade or intended persuasion, it is important to realise that as a consequence of giving some emphasis to cognitive factors, that is modes of construal, influence can be both inten-

tional and unintentional. As French and Raven (1959) point out the mere presence of others can have both a behavioural and cognitive effect. For example, the near proximity of a policeman will influence most people in one way or another, whether or not he has shown any interest in them. The point is further emphasised by results from social facilitation research (Allport, 1924; Dashiell, 1930, 1935; Zajonc, 1965; Zajonc & Sales, 1966).

Taking this line of reasoning further, some interesting implications emerge. First, because situations of control and influence are distinguished, from the point of view of the target, in terms of perceptions of levels of choice, it follows that any given relationship can, under some circumstances, be at the same time one of power, and one of influence. For example, a situation can arise, theoretically, where the source of attempted persuasion sees and intends a situation of control, but the target perceives it otherwise, and vice versa, as the following incident from the American Civil War illustrates:

> "The story went round how General Wigfall, commanding Texas troops, came across a guard reclining on a pile of boxes, his musket leaning against a nearby tree. 'What are you doing here, my man?' asked the General. 'Nothin much, jes kinder takin care of this hyar stuff,' replied the private without moving from his reclining position. 'Do you know who I am, sir?' 'Wal, now pears like I know your face, but I can't jes call your name - who is you?' 'I'm General Wigfall.' Without rising, the soldier stuck out his hand. 'General, I'm pleased to meet you. My name's Jones.'" (Katcher & Youens, 1975: 16)

Second, taking into account the view that an individual is, so to speak, at the nexus of a <u>network</u> of lines of influence and power emanating from all other members of the group, it follows that the <u>major</u> source of influence or intimidation may be the group itself,

rather than specific individuals within it. Thus, for instance, even where an individual, when compared singly with each other member of the group, may be counted in some way as the most influential, nevertheless his or her influence may well be tempered, compromised or subverted by the influence exerted by the group as a whole, especially if the members are acting in collusion. Furthermore, as a source of influence the group is also a potential source of coercion, and any single member may feel constrained to act in ways that they would rather not as a result of group pressure. Even 'leaders', however defined, may feel intimidated by the group (see MacGregor-Burns, 1978: 422 - 425; Wilson, 1985: 142 - 153 for historical examples).

As a general point, therefore, even where influence is distributed asymmetrically, highly influential persons are not free to define situations in any way they choose; interdependency is maintained (Hollander, 1964; Hollander & Webb, 1955; Lortie-Lussier, 1987).

These sorts of factors have been amply demonstrated by the behaviour of subjects in the studies of Asch (e.g. 1951) and Milgram (1974), by the results of social facilitation research (e.g. Allport, 1924; Cottrell et al., 1968; Dashiell, 1930, 1935; Zajonc, 1965; Zajonc & Sales, 1966), research into bystander apathy (Latané & Darley, 1970; Latané & Rodin, 1969), Sherif's classic studies of the formation of group norms (e.g. Sherif, 1936) and studies of groupthink (Janis & Mann, 1972). They are also evident in historical accounts of mutiny (see for instance, Duncan, 1976; Ereira, 1981; Denton, 1988; Neale, 1985; Rothstein, 1985; James, 1987). Amongst other things, this raises the point that issues of

choice and constraint are also relevant for 'leaders', however defined, as much as for followers.

All of these examples emphasise the element of choice, specifically in terms of values about means and ends (Brown & Hosking, 1984; MacGregor-Burns, 1978). They underline the interdependent nature, as well as the relativity, of power and influence. They also suggest very strongly that examples of successful, as opposed to attempted, influence (Bass, 1961), indeed also successful control, are only successful with the collusion of those who co-operate or comply.

It must again be emphasised that relations of influence and control as here defined, are not synonyms for leadership and headship respectively; either can generate co-operation or compliance. That is to say, either can generate commitment or resistance. It is undeniable, for example, that for many people, for whatever reason, the 'proper' way to organise necessarily involves formal positions, rules, regulations and sanctions, even if they themselves get the short end of the stick, so to speak. In other words, the trappings of reduced choice are not necessarily seen as illegitimate by participants. A prime example would be the classic 'authoritarian personality' of Adorno et al (1950). This of course is a direct example relating to values about means.

It follows that access to, or even use of, sanctions is not a critical determinant of situations of leadership or otherwise; they may be regarded as an acceptable general aspect of the social contract between participants (Handy, 1985), or of the social

order of the group (Hosking, 1988, Kelvin, 1970). The critical point in specific cases is whether they are used in ways and to an extent regarded as legitimate by the group. Again this point can be emphasised with reference to the literature on mutiny. In many cases mutiny was sparked by an over use, or an unfair use, of sanctions, not the use of sanctions per se, which were often regarded as legitimate (see for example, Duncan, 1976; Ereira, 1981; Mainwaring & Dobrée, 1935; Neale, 1985; Rothstein, 1985). The line of legitimacy marks the point at which the use of or access to sanctions changes from being acceptable to the group, to becoming unacceptable. This thus emphasises a proposition about acceptable power as well as acceptable influence. More generally, it is a proposition about acceptable means towards ends.

It follows that both situations of power and influence, as here defined, can constitute either examples of leadership, or, in Gibb's terms, headship. The critical difference lies in the values with respect to means and ends held by all members of a group, and, to reiterate a point made earlier, the extent to which the use of sanctions, or even the avoidance of sanctions, is maintained in the face of opposition or resistance from the group. It takes no imagination to see that from this it also follows that a set of mixed values could be a recipe for disaster, and later, it will be argued that a fundamental functional aspect of leadership is to bring disparate value systems into a working harmony.

8. SHARED VALUES.

Throughout the discussions above it was emphasised that the critical issue is perceptions of choice in relation to values about

means and ends, and perhaps the relation between means and ends. It was suggested that if a group was to avoid internal conflict, some level of intersubjective understanding with respect to these values was essential. In other words, it is necessary for these values to be shared. The best way to illustrate this proposition is through a consideration of situations where the working arrangements of a group have broken down, that is to say by examining situations of mutiny.

This is obviously not the context to present an extended discussion of the available literature on mutiny; a short account should be sufficient. Nevertheless, consideration of such situations is useful and important from the point of view adopted here, because it underlines most forcefully the negotiated nature of leadership phenomena, as well as the critical part that values have to play. Consider, for example, the following account of an incident in Italy immediately following the Armistice of 1945:

> "... What's this nonsense?' I said 'Get out on parade.' They stood to attention, as was right when an officer addressed them, and not a man moved. I walked up to one man I knew well. 'You, Thomas Atkins,' I said, addressing him by name, 'I am ordering you to go on parade.' He stood still, looking through me as if I wasn't there. What more could I do? No one man can make eight men obey him if they are resolved to disobey." (Carrington, 1965. Emphasis added).

This presents an interesting situation. Judging from the reported evidence of their behaviour in front of the officer, the soldiers apparently accepted that at some level his directives were legitimate, that is that they had a legitimate basis, but in the circumstances he was divested of influence in the sense that he was unable to effect their actions. Thus, while the officer may have

been regarded as having the right, in some sense, to give orders, choice had been exercised; his influence, at least in relation to this issue, was not acceptable or accepted.

Similar situations have been recounted with regard to other mutinies, for example that of the Atlantic Fleet at Invergordon in 1931:

> "Officers were treated with normal respect except that orders, other than ones essential for the good of the ship, were ignored. 'Skippers', and popular officers mostly got normal service but on the whole the majority found that they had to do their own chores or allot such to midshipmen when spuds needed peeling!" (Duncan, 1976: 40. Emphasis added. See also Ereira, 1981).

On a more militant note, there is an interesting example from the American Civil War. In the early stages of the war the soldiers of the Confederate Army were able to transfer between units and even arms of the Army. The upshot was that appointed officers often had nothing to command. Unpopular officers, particularly those with a reputation as martinets, often found that their units had transferred en masse to other units, resulting in an officer appointed to command, but with nothing to command, except on paper (Katcher & Youens, 1975). This is a most striking example of the difference between formal role position and leadership, and it underlines the necessity for the distinction. Moreover, since those officers who suffered this fate were usually those with a record of maltreatment of their troops, then this example serves to illustrate the point that perceived legitimacy is not a simple function of formal appointment. That is to say, the mere fact of appointment does not mean that that any and every kind of behaviour is legitimate, and that legitimacy is not an attribute that can be imposed. It also

underlines the important part that values have to play in leadership phenomena.

A more direct example of these factors can be found in an incident in the English Civil War. When Henry Lillburn (brother of the famous Leveller) tried to betray Tynemouth Castle to the Royalists on the 9th August 1648, his soldiers, who were nearly all committed Parliamentarians, simply refused to help him. Despite coercive measures, in the form of Royalist prisoners and disaffected sailors from nearby, plus the execution of one of his corporals, he was unable to enlist their support. In the event most of them escaped, to return later with a counter force (Brailsford, 1961; Reid, 1985).

In this example, it is clear that Lillburn's values had ceased to be consonant with those of his soldiers. What he was trying to do would have involved the troops in his command in actions contrary to their expressed commitments and values, and as a consequence they refused co-operation. Even worse, from his point of view, they later cut his head off and displayed it above the castle gate, an eloquent, if extreme, way of showing their disapproval. (For a similar event, see also the account of the arrest of Sir Alexander Carew at Plymouth in 1643, in Gardiner, 1987, volume 1).

So what conclusions can be drawn from these examples? First, more than any other situation, mutiny underlines the difference between leadership and headship. It demonstrates that, even in formally defined situations, influence and power do not reside solely with the formally defined head, and that therefore **dependence is not**

unilateral. Leaders, however conceived, **cannot lead if their followers don't let them**, that is that there is a limit to the extent that behaviour can be forced without due regard to the consent and willingness of those that are expected to follow. It is clear that mere institutional power (Kelvin, 1970) is not sufficient to guarantee co-operation and commitment: nor is it necessary. In all of the accounts cited above, and others, persons emerged from the body of mutineers who fulfilled the functions of leadership (see Brailsford, 1961; Denton, 1984; Duncan, 1976; Ereira, 1981; Lamb, 1977; Rothstein, 1985).

Mutiny indicates that the affective and evaluative reactions of the so-called followers **must** be taken into account, not as mere epiphenomena, but as critical aspects of leadership phenomena, and that influence attempts must be regarded as acceptable to those who are expected to follow them.

Finally mutiny demonstrates that legitimacy is not simply a matter of formal position, but is an attribution made by those who follow which cannot be imposed from without. To the extent that legitimacy is an attribution based on values, this also draws close attention to the important part that shared values play in leadership phenomena.

All of these points are properly conceived as aspects of choice, and the suggestion is that leadership, as opposed to institutional control, is precisely a matter of perceived choice in the followers, that is to say, those who **choose** to follow.

9. INTERSUBJECTIVITY AND SOCIAL ORDER.

Taking the points about shared values further, it is obviously unlikely that all values will be shared equally by all participants. Nevertheless, it is important that there should be a working harmony, such that any differences present no obstacles to perceived interdependence of actors. To take another historical example, Presbyterians and Independents were able to work successfully together during the Civil War while both groups could perceive a **mutual benefit**, and while their differences presented no hindrance (see for example Gardiner, 1987; Hill, 1974; Underdown, 1985. See also the letter from Oliver Cromwell to the House of Commons, 14th September, 1645, in Sprigge, 1647: 112 - 118). Once, however, value differences became emphasised, then the working relationship broke down (Gardiner, 1987). The same conclusion can be drawn from the relationship between officers and men of the New Model Army at the outbreak of the Second Civil War, which followed immediately on from the so-called 'Crisis' of 1647 (see Bemrose, 1987; Brailsford, 1961; Denton, 1984; Kishlansky, 1979; Woodhouse, 1986).

This might be taken as a doctrine of expediency, but nevertheless, the point remains that those values which need to be shared for successful actions, are those which might be called 'operative' values, that is to say values which are relevant to, and salient for, the work in hand. Thus, for example, socialists and conservatives can work successfully together on some projects where operative values are shared, but not those where the relevant operative values are at variance.

Equally important is that not only should operative values be shared, but also that they should be understood by all participants to be shared, that is to say, it is essential that there be an intersubjective understanding that operative values are shared. Evidently, where no such understanding exists, then there is no basis for action, that is to say, there is no basis for organising action. Thus, intersubjective understandings of shared operative values is, first, an essential basis for the establishment of social order, and second, an essential aspect of leadership relations.

If there is no shared basis for action, then attempted influence is likely to be at variance with the relevant operative values, and as a consequence be construed negatively or simply ignored. This was demonstrated by the examples in the last section. Equally, however, where there exists no basis for assuming that operative values are shared, then influence attempts are likely to be hesitant, non-existent, or inappropriate. Therefore, intersubjective understanding of shared operative values is essential for appropriate, that is acceptable, influence attempts to be made. By definition, where no such attempts are made, then there can be no leadership.

More important, however, is that it is this intersubjectivity which lies at the heart of the concept 'social order', which was defined in the last chapter as a shared sense of understanding, reflected in action and cognition, about how things are done, what things are done, who does them and why (see last chapter).

Thus, although the route is somewhat circuitous, the formulation of 'leadership' can be linked directly with the formulation of 'group' given in the last chapter. Specifically, leadership is an essential aspect of the formation and maintenance of a group, as opposed to an aggregate, and to some extent the criteria by which relations of leadership are judged are the same as those by which a collection of people is judged to be a group.

If this were all that were involved, of course, then there would be no need for the concept leadership at all; all that would be necessary is an articulated concept of group. The link between the two concepts is, however, more than simply this; what the statement above amounts to is that the quality of the relations between persons in a group, as defined, is the same as the quality of relations which denote leadership as opposed to some other relation such as headship. It is the quality of the leadership relationship which has formed the bulk of the discussion so far, and the various aspects of the relationship, constitute, in effect, the necessary conditions of leadership. Over and above this, however, there are what may be called functional aspects, and these help to forge the link between the concepts group and leadership to a much greater extent.

10. LEADERSHIP DEFINED.

Leadership is not simply a quality of relationships, it is also the process by which those relationships are established and maintained. As Morley and Hosking (1986) put it, leadership is a special kind of organising activity. In relation to the arguments given above, it is clear that leadership is organising activity

which takes place within, and is responsive to, a context of choice understood in relation to operative values with respect to means and ends. More than this, however, leadership consists of acts which contribute to the shaping and maintenance of that context. In sum, leadership does not simply take place within a social order, but is also the process by which social order is created and maintained (Kelvin, 1970), including the framing of operative values and the establishment of appropriate, that is acceptable, ends towards which action is directed. Leadership is, therefore, the process by which an aggregate becomes a group.

Taking the term "reality" to refer to any set of values, perspectives, understandings, aspirations, and so on, and relating this to the idea of a group as a network of influence and power, it becomes plain that any given group is likely to be composed of people with diverse and sometimes competing realities. Moreover, to a greater or lesser extent, there are also likely to be partial realities, that is to say perceptions and understandings which are inadequate as heuristic guides to action in the context of the group.

Leadership is the process by which a group reality, that is a shared understanding of social order, is established, and maintained (Kelvin, 1970). It involves the harmonising of disparate realities, settling disagreement by satisfying (by negotiation) the differences in the service of joint action. Where realities are partial, leadership is the process by which they are completed to the extent of enabling action. To this extent leadership has a common link with teaching (MacGregor-Burns, 1978), and as Morley

and Hosking (1984) have observed it is a process involving social skills, but more importantly, as they suggest, the processes by which disparate realities are brought into harmony are essentially the processes of negotiation whether tacit or overt.

In sum, leadership reduces uncertainty in the social context (Kelvin, 1970) by providing a cognitive framework for action in relation to the values shared jointly by participants, whether these values are created within the group context or are brought to the group by its members. It involves, as Smircich and Morgan (1982) observe, "the management of meaning" through the process of interpersonal negotiation. This implies, of course, that any group level reality which is established, is subject to renegotiation either periodically or continuously (Hosking, 1988). This links with the point about choice made earlier; people don't negotiate when choices are perceived to be unequally available. Therefore acceptable influence implies opportunities to negotiate and refuse.

By this view, therefore, leadership acts are those which contribute directly to the establishment of group level reality, that is leadership acts are those which contribute to the shared sense of social order within the group. In principle, therefore, any specific type of act can count as a leadership act (Cartwright & Zander, 1953b, 1960b), so long as it is perceived to contribute in some positive way to the social order of the group.

Consistent with this view, although by no means a corollary of it, is the proposition that, therefore, leadership acts can in princ-

iple be contributed by any member of the group, and the sum of these acts therefore constitutes leadership for the group. This sort of view is at the heart of Gibb's concept of distributed leadership (Gibb, 1958; 1969), and, as will be apparent, underlies to a great extent the view propounded by Bales (1953a), and discussed in chapter 2. It has, however, been criticised. Kelvin (1970), for example, complains that it implies that any person exerting momentary influence on the group may therefore be considered group leader. He rejects the suggestion on the grounds that, given that it is an important part of leadership that it is the creation and maintenance of order

> "... it seems intuitively unlikely that any such order would emerge and remain if leadership were seen to pass in quick succession from one person to another." (Kelvin, 1970: 208).

It is apparent, however, that Kelvin confuses leadership as process and leadership as position, since he seems to require that in some sense an individual should unambiguously be identifiable as leader (p 205). It should be apparent, however, that the view of leadership offered here implies that such an unambiguous identification would not always be possible. This is a direct consequence of the proposition given earlier that in principle any act can constitute a leadership act. Contrary to Kelvin's view, the view taken here is that there is nothing strange in the proposition that a group can have several leaders, or even be composed entirely of leaders in some sense (Bales, 1958; Gibb, 1969).

Returning to earlier discussions, if leadership is understood in terms of contributions to social order, and also that leaders are those who make consistent contributions to order over time, and

are expected to do so, which is Kelvin's own definition (Kelvin, 1970: 208), then there is no problem with the proposition that all group members may make such contributions consistently, and be expected to do so by the rest of the group. Indeed, as noted in chapter 1, many of the social experiments in "leaderless" organising were aimed at precisely this sort of thing (see e.g. Erlich, 1976, 1977). That it might be empirically unlikely or difficult to attain is neither here nor there; the fact remains that it is a theoretical possibility. Kelvin makes the mistake of assuming that leadership resides in the actions of individual leaders; the view taken here is that leadership resides in the actions of the group as a whole in organising itself for joint action, whether the primary source of acceptable influence is one person or many. This, of course, relates very well with the view of leadership taken by Bales (e.g. 1958), that the separate contributions of different role specialists jointly constitute leadership within a group.

Considering Bales' position in relation to the view of leadership adopted here, the question remains as to whether the terms 'leader' and 'role specialist', in the Balesian sense, are synonymous. It is not obvious what the answer should be. On the one hand, specialist role behaviours are, when found acceptable, clear contributions to the social order of the group. For example, task activity can be understood as a contribution towards the defining and achievement of specific ends. On the other hand, in the light of arguments given earlier, task contributions only partially constitute leadership acts, and the same is true for other role specific acts such as social-emotional contributions. This would

suggest that persons who are pure role specialists, in the sense of contributing only role specific acts, are not leaders in the more general sense given above, although, as argued earlier, taken jointly the contributions of role specialists constitute leadership within the group.

Bales himself draws the distinction between role specific contributions and leadership. He points out that empirically leader status can be attributed to either of the specialists that he identifies, or even to a different person altogether (Bales, 1958 - see last chapter). Leader status, he suggests, is given to that person who best symbolises the appropriate weighting of task and social contributions; appropriate, that is, to the functional requirements of the group, its members, and its context. Therefore, although, as he points out, leader status is most likely to be attributed to the task specialist in the groups that he studied, nevertheless, there is no simple correspondence between the role specialists, and therefore role specific acts, and leader status or leadership (Bales, 1958; Bales & Slater, 1955; Slater, 1955).

11. SUMMARY OF THE CHAPTER.

Two major points of the thesis have been raised and emphasised throughout:

1) That positions of institutional power, denoted by formal titles and backed up with access to formal sanctions of reward and punishment, do not necessarily imply processes of leadership.
2) In considering questions of leadership, the evaluative and affective reactions of group members must be considered, not merely as epiphenomena but to identify lead-

ership processes, and those who make major contributions, that is leaders.

Throughout it has been argued that leadership is a relationship of interdependence between persons, in which acceptable influence is achieved to harness and direct joint action. It was argued that parties to a leadership relation are in a situation of promotive interdependence (Deutsch, 1968), a view that relates to discussion of the concept "group", as opposed to a mere collection of individuals, given in chapter 2. By this view, the ascription of group status and the inference of leadership processes are inextricably linked in a single formulation.

It was demonstrated that the key term social order could be used to link the concepts 'leadership', as defined here, and 'group', as defined in chapter 3. Taking the existence of a shared sense of social order to be the sine qua non of a group, and understanding leadership in terms of significant contributions to social order, it was suggested that therefore leadership, the term, denotes the process by which an aggregate of individuals becomes a group.

Leadership was distinguished from headship (Gibb, 1947, 1969) by a formulation linking acceptable influence, interdependence, negotiation and co-operation within a context of perceived choice and shared values with respect to means and ends. Leadership relations, as opposed to those of headship or mere control, have been characterised in terms of perceived choice and acceptable influence understood in relation to intersubjective understandings of shared operative values and social order. To this extent, all leadership is emergent leadership (Hosking & Morley, 1985).

Applying the view adopted here to the leadership literature, it becomes plain that the value of much of it for understanding leadership processes is limited. This is not to suggest that it is of no use whatsoever, but insofar as it concentrates on group heads, or headship, so its relevance to the social psychology of leadership becomes doubtful. It has, as it were, conflated two quite distinct conceptual categories, and as argued at the beginning of the chapter it deals with a confounded set of factors, many of which owe rather more to socio-political considerations than to social psychological ones.

PART 2: EMPIRICAL BACKGROUND.

CHAPTER 5: THE EMPIRICAL BASIS FOR ROLE DIFFERENTIATION.

1. INTRODUCTION.

The last three chapters outlined, respectively, the theoretical background to Bales' work on role differentiation, understood in terms of the equilibrium hypothesis; a theory of groups in terms of negotiated social order; and a theory of leadership in terms of the establishment and maintenance of social order within a group. The link between Bales' approach, and the theoretical formulation offered in the succeeding chapters, lies in the contention that leadership, understood in terms of process, can also be described in terms of functional contributions to the group and its activities. This is precisely the sort of view that Bales presented when he discussed leadership as a sort of weighted combination of task and social contributions (Bales, 1958). Thus, the role differentiation thesis itself can be taken as an example of distributed leadership (Gibb, 1954,1969; Shelley, 1960) in which certain aspects of leadership, that is to say, particular kinds of contributions to social order, are taken up by different individuals who specialise, or are perceived to specialise, in just those functional areas. This, it will be noted, contrasts with situations in which all functional areas are handled by the participants more or less equally. The difference is between those situations in which distributed leadership manifests in terms of

role specialisation, and those where all participants can be described in some sense as leaders.

This chapter presents a description of the empirical background to the proposition of role differentiation and specialisation. It begins with a description of Bales' method, and of those factors which he measured. Following this is a description of the principal empirical findings, along with descriptions of the analytical methods employed to derive them. Critical analysis is throughout kept to a minimum, although occasionally problems or difficulties are noted. This approach was adopted because inclusion of the critiques alongside the areas for which they are appropriate tended to break up the integrity of Bales' results. Nevertheless, a substantial critique is not only possible, but, in relation to the methods and results given below, absolutely necessary. Accordingly, a detailed critique is given in the chapters following.

2. BASIC METHOD AND ANALYSIS.

Bales' method is by now well known, indeed in some respects it consists of what have become the standard techniques used in the study of small group dynamics. This, of course, is partly as a consequence of the influence that Bales has had on the area (see for instance, Cartwright & Zander, 1953, 1960, 1968; Hare, Borgatta & Bales, 1965; Lindzey & Aronson, 1969). Nevertheless, since Bales' method underlies the approach adopted here, it will need to be summarised in some detail before his results are considered. There are, however, some problems associated with this undertaking; most of the published studies report substantially similar

details, but there are discrepancies (see Bales, 1953, 1956, 1958; Bales & Slater, 1955; Heinicke & Bales, 1953; Slater, 1955). Moreover, it is not always clear when reports are referring to the same or to different studies (Lewis, 1972), and thus it is difficult to evaluate which studies produced which results. As a consequence what follows is a very general summary of Bales' methods. Areas of discrepancy will be noted where they become apparent.

a) Subjects.

Paid male undergraduate students were organised into groups of between 3 and 6 members which met weekly for four weeks.

> "Every effort was made to insure that none of the subjects knew one another, but there were a few pairs where this condition was not met." (Bales & Slater, 1955: 261).

This condition for groups to be composed of strangers has attracted some criticism (Verba, 1961; Wilson, 1969), but it is as well to note that Bales' intention in these studies was to capture the development of structure from a minimum starting point:

> "In effect, they were faced with the problem of getting organised as well as with the more obvious problem that was issued to them." (Bales, 1958: 437)

and in this respect it was important that structuring factors such as friendship ties should be minimised

> "We wanted to observe the development of role differentiation from some minimum starting point." (Bales & Slater, 1955: 261. See also Gibb, 1969, for a similar view).

b) Task and procedure.

The set task, referred to as the "standard task", involved disc-

ussion of a "human relations case", for which each participant was given a five page summary of details (Bales, 1952: 147; 1956: 153 - 154; 1958: 437). Details of the cases are not, unfortunately, given in the standard sources on role differentiation (that is Bales, 1953, 1956, 1958; Bales & Slater, 1955; Slater, 1955), but there is an abbreviated description of a case given in Heinicke and Bales (1953), which may well be one of those referred to in the standard sources:

> "While overseas Allen has had an affair with an English girl, and feels obliged on his return to tell his wife; but he hesitates because of her strong feelings about infidelity. (Adapted from Deutsch [1949].)" (Heinicke & Bales, 1953: 9).

The groups met for repeated sessions (the cases being different on each occasion); the distribution amongst groups was counter-balanced (Heinicke & Bales, 1953: 8). Participants were asked not to compare summaries, which were taken back before the session began:

> "Members were given separate identical copies of the case to read ahead of time and were told that, although each was given accurate information, we intended to leave them uncertain as to whether they each had exactly the same range of facts." (Bales, 1958: 437. Also, Bales, 1952: 147; 1956: 153 - 4).

Each group was told to consider itself as the administrative staff of a central authority, and were asked to give their opinions as to the explanation for the behaviour of the people cited in the summaries,

> "... and to decide what should be recommended as action for the solution to the problem presented." (Bales, 1958: 438. Also Bales, 1952: 147; 1956: 154).

The groups were to time <u>themselves</u> for 40 minutes, after which they were to dictate the group solution "for the sound record" in

the final minute or two of the session (Bales, 1956: 154, 1958: 438). Thus in many respects, the group task resembled case study analysis techniques currently popular in the teaching of Organisation Behaviour (see, for example, Clegg et al., 1985; Gordon, 1987). The groups in Bales' studies, however, were given minimal information about how to solve the problem, and none at all about how to organise themselves.

Audio recordings were made of the discussion, and the interaction scored by observers seated behind a one-way mirror using Bales' Interaction Process Analysis (Bales, 1950, 1956, 1958; Bales & Slater, 1955). It should be noted that this was done with the knowledge of the subjects, to whom the mirror and microphones were pointed out at the beginning of the session (Bales & Slater, 1955: 261).

c) Sociometric questions.

At the end of each discussion session, participants were asked to complete a sociometric questionnaire. There is some inconsistency in the reporting with respect to the questions, but they are fairly covered by what follows. In each case the principal source is given first, and comparative sources afterwards.

1) Who contributed the best ideas for solving the problem? Please rank the members in order. Include yourself (Bales & Slater, 1955: 262. Also Bales, 1953a: 471, 1956: 154; Heinicke & Bales, 1953: 10, & 11; Slater, 1955: 611).

2) Who did the most to guide the discussion and keep it moving effectively? Please rank the members in order. Include yourself (Bales & Slater, 1955: 262. Also Bales, 1953a: 471; Heinicke & Bales, 1953: 10 & 11; Slater, 1955: 611).

3) Regardless of how valuable you felt he was to the group, how well do you like each of the other members of the group? Please rate each of the other members on a scale of 0, 1, 2, 3, 4, 5, 6, 7, where "0" is equivalent to saying: "I feel completely neutral toward him," and "7" is equivalent to saying "I like him extremely well." (Bales, 1956: 154. Also Bales, 1953a: 471; Bales & Slater, 1955: 262; Heinicke & Bales, 1953: 12; Slater, 1955: 612).

4) To what extent do you find qualities in other members of the group which you personally dislike or which seem to irritate you? Please rate each of the other members on a scale of 0, 1, 2, 3, 4, 5, 6, 7, where "0" is equivalent to saying: "There is nothing I dislike about him," and "7" is equivalent to saying: "I dislike everything about him." (Bales, 1956: 154. Also Bales, 1953a: 471; Heinicke & Bales, 1953: 12).

At the end of the fourth (and final) session, participants were asked an additional question:

5) Considering all the sessions, which member of the group would you say stood out most definitely as a leader in the discussion? How would you rank the others. Include yourself. (Bales & Slater, 1955: 262. Also Heinicke & Bales, 1953: 10 & 12; Slater, 1955: 612).

d) Basic analytical dimensions.

The results of the post-session questionnaire and the IPA scores, were averaged, sometimes across groups, sometimes across sessions, sometimes both, and each participant was rank ordered on each of several dimensions, or "roles", as Bales sometimes calls them (see especially Bales, 1953a: chart 2, p 473). Again, the numbers of such dimensions vary according to the specific report under consideration, but overall there were six that Bales and his colleagues considered at various times:

a) Ideas (mean rank received on question 1 above)

b) Guidance (mean rank received on question 2 above)

c) Liking (mean rating received on question 3 above)

d) Disliking (mean rating received on question 4 above)

e) Talking (total number of IPA acts initiated; this provided the data for the derivation of the Basic Initiating Rank used in most of the graphical presentations of results. (See Bales, 1953a: 473, 1956: 158, 1958: 445)

f) Receiving (total of IPA acts received)

It is important to note that the data thus derived from the scoring techniques and questionnaires are relevant to role differentiation both in the **behavioural** and the **cognitive** sense. That is to say, the data give evidence of behavioural enactment of specified role behaviours (derived from the IPA categories), and, separately, role enactment as it is or is not perceived to have occurred. The difference is between what Bales and Slater (1955) call the overt and latent aspects of differentiation:

> "In choosing to make both types of measurement we assume from the very beginning that a fundamental aspect of differentiation is a differentiation between overt behaviour and underlying attitude." (Bales & Slater, 1955: 263).

It is, therefore, important to keep the two senses separate because, quite obviously, what actually occurs at the overt level in a given situation, in some objective sense, does not necessarily correspond with what has been perceived to have occurred, or, perhaps more important, how it was construed by the actors (Blumer, 1969; Goffman, 1959; Hewitt, 1979; Lindesmith et al., 1977; Mead, 1934; Meltzer, Petras & Reynolds, 1975; Stang et al., 1976). It is worth noting in passing, however, that the passage quoted above suggests that Bales expected the behavioural and perceptual aspects of role differentiation to be generally uncorrelated.

e) Group roles.

In relation to the sorts of measurement described above Bales lists a series of operational definitions of role types that may be observed in small groups (Bales, 1956: 155 - 156, 1958: 447 - see the bottom of this page). It must be emphasised in this context that Bales lays great stress on having identified the three dimensions which later underpinned SYMLOG, that is activity, task ability and likeability. It is even more important to realise that he considers the dimensions to be, in principle, orthogonal, although not necessarily uncorrelated in particular empirical circumstances. In other words, he believes them to be independent of one another, generally speaking (Bales, 1956; 149 - 151, 1958: 443 - 444 & 446). The role types, then, are as follows:

1) The "Great Person", or "Great Man", as Bales puts it, is a member who is high on the three factors activity, task ability and likeability. This role type, he says:

> "... corresponds to the traditional conception of the good leader ... Such [persons] are found, but if the factors are uncorrelated, are rare." (Bales, 1958: 447).

2) The Task Specialist, is a member who is high on activity and task ability ratings (i.e. Ideas and Guidance), but less high on Likeability.

3) The Social Specialist, is a member who is high on likeability but less high on task ability and activity. Interestingly, Bales comments that:

> "This type is much less rare than the first type [the Great Person] and groups which operate under the dual leadership of a man of this type and of the second type [i.e. task specialists] are common." (Bales, 1958: 447. Emphasis added).

4) The Overactive Deviant, or simply "Deviant" (Bales, 1956: 156), is a member who is high on activity but relatively low on task ability and likeability ratings.

5) The Underactive Deviant, (Bales, 1958) or "Residual Member" (Bales, 1956) is someone who is low on all three scales, and "may in fact be a kind of scapegoat". Of this type, Bales says:

> "On the assumption that the factors are uncorrelated this type should be as rare as the first type, but since the lack of correlation traces mainly to discrepancies at the upper end of the scales, this type is not actually so rare as the first type, and is, in fact, probably very common." (Bales, 1958: 447).

Although five roles are listed in all, only two of them, the task and social specialists, figure to any great extent in Bales' discussions, or the commentaries of his critics. Indeed, given his analytical procedures, it is difficult to see how he could ever have identified any of the role types in his groups any way (see chapter 6 below). The list is important, however, insofar as it plainly provides evidence that Bales considered more than simply task and social roles in his work. Indeed, he went further, and makes it quite clear that even the list of five role types is not, in his opinion, necessarily exhaustive:

> "Logically, of course, one can distinguish many additional types. Those mentioned, however, have a certain intuitive distinctness ..." (Bales, 1958: 447).

In this respect Bales' three major works are of the utmost importance (Bales, 1950, 1970; Bales et al., 1979). In particular, the last lists something in the order of 26 interrelated role types (see Bales et al., 1979: appendix A).

f) Index of status consensus.

Prior to the analysis of the data, each of the groups studied were classified according to the degree of consensus as to the rankings group members assigned one another in response to the sociometric questions given above. The rationale for this was based on the results obtained by Heinicke and Bales (1953), who observed that developmental trends in groups seemed to vary according to the

extent of consensus within the group:

> "... the two types of groups show tendencies so different that we feel obliged to analyse them separately." (Bales & Slater, 1955: 276. See also Slater, 1955: 612).

The measure used to represent status consensus was based on Kendall's Coefficient of Concordance, usually referred to as Kendall's W (Kendall, 1948). The coefficient of concordance is obtained from a matrix of rankings, with each group member, arranged in vertical order on a series of rows, ranking each other member, arranged in horizontal order on a series of columns (see appendix J below). The formula is:

$$W = \frac{12S}{k^2 \ (n \ (n^2-1)}$$

where S is the sum of the squares of the deviation of the column totals from the grand mean, n is the number of individuals (or items) ranked by k individuals. W takes values of between 0 and 1, where 1 indicates perfect agreement (Bales & Slater, 1955: 276; Heinicke & Bales, 1953: 19; Slater, 1955: 612. See also Kendall, 1949: 160 ff; Siegel, 1956: 229 - 238). It is important to note that the formula given above, and used by Bales and his colleagues, is only appropriate for matrices in which the main diagonal is non-void, that is to say, in the present context, with self rankings included. Taylor (1951) later modified the statistic to permit exclusion of self ratings and called it W' (see Jones, 1959; Smith, 1963, and appendix J below).

Kendall's W was calculated for each group from the scores on Ideas and Guidance (questions 1 & 2, section 2c above). The mean of the two values of W was then taken for each group, and it was this

value which was taken as the Index of Status Consensus for that group. Groups with a mean value of W of .500 or above <u>over all four sessions</u> were classified as high status consensus groups, and those with a value of less than .500 were classified as low status consensus groups (Bales & Slater, 1955: 276 - 277; Slater, 1955: 612. See also Heinicke & Bales, 1953: 19 - 21).

The reasoning behind the calculation of a status consensus measure has much in common with the social order arguments presented in chapters 3 and 4 above:

> "Role differentiation in the fully developed sense rests on the existence of a culture common to the members of a system. The expectation members have as to the specialised roles each will perform are only a part of the common culture, but they constitute an important part of it. Possesion of a common culture, in turn, implies some degree of **<u>consensus</u>**. There are degrees of consensus. All, or only some of the members of the system may have similar expectations. All may have similar expectations, but not yet "know" that they are similar. And so on, with many degrees of complication." (Bales & Slater, 1955: 274. See also chapter 3 above, pp 121 - 127, and chapter 4, pp 160 - 162).

Thus, for Bales the measurement of consensus is, in fact, a measure of common culture. In the terms introduced in the earlier chapters of this thesis, it is a measure of one aspect of shared understandings about social order. It is worth noting that this explanation has <u>never</u> appeared in any of the commentaries on Bales' work in the literature.

3. RESULTS.

In evaluating the results pertinent to the role differentiation hypothesis, it is important to emphasise again that as far as Bales was concerned role differentiation was a genuine empirical

discovery (Bales, 1958. Also Bales, 1968, cited in Burke, 1972. See also chapter 2). That it was already implicit in his thinking, as argued in chapter 2 above, is of course important, but nevertheless the empirical results can still be taken at face value for present purposes.

As an initial working hypothesis concerning the emergence of structure in initially unstructures groups, Bales and his colleagues adopted the 'hypothesis of a single status order'. They posited the emergence of a status structure along a **single** qualitative dimension, that is, perceived leadership (Bales, 1953a: 471, 1958: 439). What was expected was that curves on all the sociometric scales would vary in the same way as observed activity rate. That is, the most active group member was expected to score highest on the scales of task ability (Ideas and Guidance) and 'sociability' (Liking), and lowest on 'dislikeability' (Disliking). The rest of the group members were expected to be ranged systematically on all scales according to activity rate, with the least active member scoring lowest on task and likeability, and highest on disliking. This is what Bales referred to as the "simply organised group" (Bales, 1953a: 471 - 472, 1958: 439), with leadership in the group manifesting in the form of an "all round 'great man'" (Bales, 1958: 439. See also Borgatta, Couch & Bales, 1954). This expectation, however, was not supported by events; the task specialist turned out not to be best liked. In point of fact:

> "... the stable structure is never, in our data, a 'simply organised' one. It is rather one in which **differentiated** roles have appeared, in which one specialist 'undoes' the disturbance to equilibrium created by another, and in turn is dependent upon another to remove the strains he himself creates - the total constellation of specialists being one

> which allows or aids the system to establish a full orbit in its dimensions of necessary movement." (Bales, 1953: 475. Emphasis added).

This is the crux of the evidence claimed to show differentiation of the leadership role.

Again, it is important to emphasise that all of the evidence presented by Bales and his colleagues is of a highly **general** nature. That is, the data are aggregated across groups and group sessions, and sometimes also reassembled in such a way that the original groups from which they are derived are, in a sense, lost altogether. It is therefore apparent that the empirical propositions about role differentiation are, in the terms proposed in chapter 2 above, presented at the **general** (aggregated) empirical level, and not at the **specific** empirical level. In other words, **nowhere does Bales examine the role differentiation hypothesis in terms of single specific identifiable groups**. This fact is important when evaluating those critiques addressing the extent to which role differentiation does or does not occur (e.g Wheeler, 1957). Later in the thesis there will be occasion to be highly critical of this particular feature of Bales' empirical approach.

The evidence of role differentiation that Bales presents falls roughly into two categories; correlational evidence, and what is referred to as percentage coincidence, which is essentially a frequency count (Bales & Slater, 1955; Slater, 1955). These break down further as follows:

a) **Correlational evidence** is first used to examine the relationship between results on the sociometric scales and gross activity rate, and

b) to examine the relationships between the sociometric

(perceptual) scales and behavioural measures of initiating and receiving.

c) **Percentage coincidence data** are used in the examination of what is called "isolated prominence", that is cases in which individuals are rated top on one and only one of the sociometric scales, or appear as top on the behavioural measure of activity. It is also used

d) to examine the occurrence of top ratings on two measures simultaneously, later extended to a consideration of trends in "specialisation" over time, and the relation between leader status attribution and the other scales.

A third area of evidence is also apparent, although it really constitutes a development of the two areas just described. It consists of the behavioural (IPA) analysis of persons identified as top on Ideas, and best-Liked, identified using the results from the sociometric questions Ideas and Liking. Each type of evidence will be described in turn.

4. ACTIVITY RATES AND SOCIOMETRIC RATINGS.

In general one of the first things to emerge from these studies was a striking relationship between the amount a person talked and how they were ranked on Ideas and Guidance. Equally striking was the relationship between Ideas and Guidance themselves. Surprisingly, however, the person ranked top on Ideas and Guidance appeared to be "unaccountably low" on ratings received for Liking, in point of fact receiving less on average than the second and third persons on activity (Bales, 1953 a). The critical diagram, by now well known, clearly illustrates the effect (see figure 5.1).

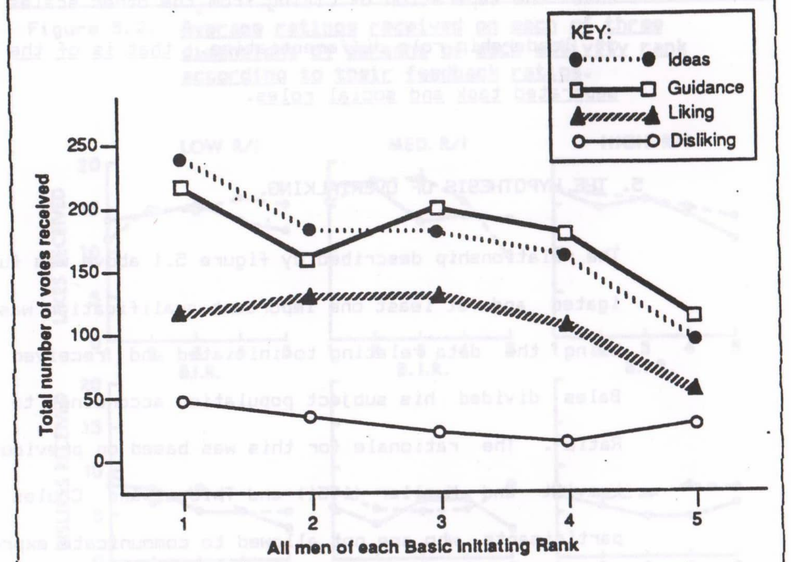
In Bales' words, this diagram raised "a most interesting set of questions" (Bales, 1958: 440); for example it appeared that:

> "... there was something about arriving in a top status position, owing to technical contribution to

the task problem, that tended to 'lose friends and alienate people'." (Bales, 1956: 152. Also Bales, 1958: 441).

Figure 5.1. "Total number of votes" received on each of four roles.

Data from twelve assorted meetings of four 5-person groups, pooled for persons of each Basic Initiating Rank.*



* The Basic Initiating Rank is a measure of activity based on the number of IPA acts initiated. Details of its derivation are given in Bales et al (1951).

From Prince (1986a: 7), adapted from Bales (1953a: 473).

See also Bales (1958: 440).

Relating this result to the conceptual proposition that task activity per se creates disequilibrium within the group, and therefore generates negative affect, Bales suggests that the negative affect would, generally speaking, be directed towards that

person perceived as the cause of the imbalance, that is the person most active in the task area whom he calls the Task Specialist (Bales, 1958: 441). Since the person best-Liked tended on average to be the second most active group member, Bales further suggested that such a person must be engaging in some sort of social activity, that is making conciliatory gestures, showing solidarity, and so forth (Bales, 1953: 474). In other words, Bales was claiming that the separation of Liking from the other scales was evidence of leadership role differentiation, that is of the emergence of separated task and social roles.

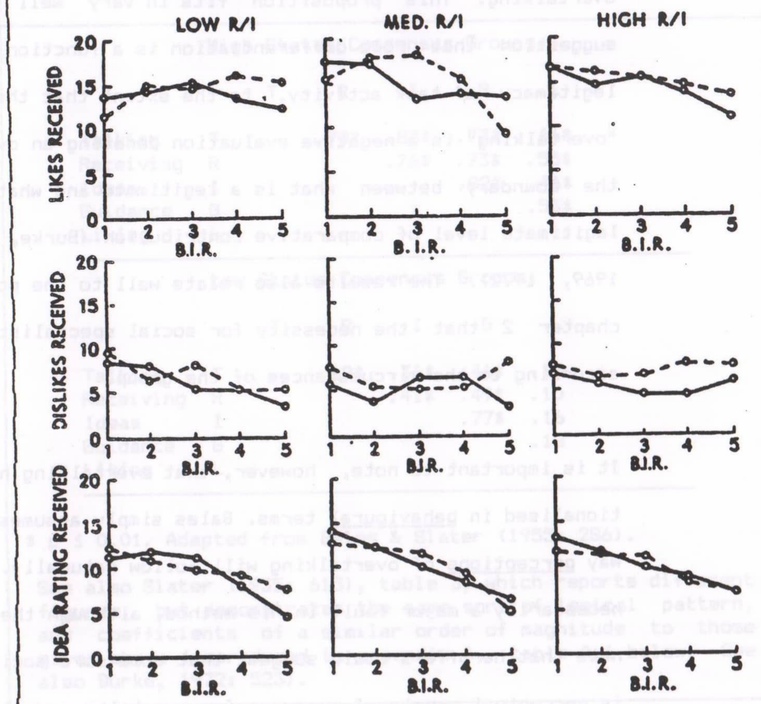
5. THE HYPOTHESIS OF OVERTALKING.

The relationship described by figure 5.1 above was further investigated and at least one important qualification was identified. Using the data relating to initiated and received interaction, Bales divided his subject population according to a "Feedback Ratio". The rationale for this was based on previous findings by Leavitt and Mueller (1951) and Thibaut and Coules (1952) that participants who are not allowed to communicate express hostility and dissatisfaction. This gave rise to the "hypothesis of individual differences in overtalking" (Bales, 1958: 444).

First Bales divided the results from his subject sample according to activity rates (Basic Initiating Rank). Within each initiating rank, he then further subdivided the results into three subgroups according to the ratio of participation received to that initiated. This he labelled R/I, or the "Feedback Ratio". That is, he pooled results from all persons of, say, initiating rank 1, across groups and sessions, and then further separated these into one of

three categories according to "Feedback Ratio". A high R/I he defined as a situation in which an individual receives comparatively more than he or she initiates. Correspondingly, therefore, "overtalkers" are those persons who exhibit a low R/I (Bales, 1956; 158 - 159, 1958; 444 - 445). The results from this procedure are reproduced in figure 5.2 below.

Figure 5.2. Average ratings received on each of three dimensions by persons of each activity rank according to their feedback ratios.



From Bales (1956: 158).

See also Bales (1958: 444).

It will be noted that the diagrams above do not represent results from groups; they are indicative of patterns of correlation according to particular empirical measures of what might be called individual activity style; it is apparent that scores were culled from the groups studied and reassembled. Nevertheless, although the patterns exhibited in the diagrams above are by no means clear cut, they are suggestive. They would seem to suggest that role differentiation only occurs in situations where the person making the largest contribution to task achievement is, in this sense, overtalking. This proposition fits in very well with Burke's suggestion that role differentiation is a function of perceived legitimacy of task activity, to the extent that the description "overtalking" is a negative evaluation denoting an overstepping of the boundary between what is a legitimate and what is a non-legitimate level of comparative contribution (Burke, 1967, 1968, 1969, 1972). The results also relate well to the points made in chapter 2 that the necessity for social specialists will vary according to the circumstances of the group.

It is important to note, however, that overtalking here is operationalised in behavioural terms. Bales simply assumes that in some way perceptions of overtalking will follow naturally. This is not necessarily a major fault in his method, although the basic rationale that he offers would suggest that some more sociometric, that is perceptual, sorts of measures for overtalking would have been a useful adjunct to the measures that he did use (see also Stang et al., 1976).

6. INTERCORRELATIONS BETWEEN ALL DIMENSIONS.

A second limiting condition of role differentiation apparently emerged when the intercorrelations between all the measures taken were examined. In this case it was related to the degree of consensus observed within the group (see section 2f above). The results are reproduced in table 5.1 below.

Table 5.1. Intercorrelations between Talking, Receiving, Ideas, Guidance and Liking.

(Mean rank order correlations of 40 sessions. Size 3 excluded)

High Status Consensus Groups.

		T	R	I	G	L
Talking	T		.90*	.83*	.73*	.46*
Receiving	R			.76*	.73*	.55*
Ideas	I				.82*	.46*
Guidance	G					.53*
Liking	L					

Low Status Consensus Groups.

		T	R	I	G	L
Talking	T		.69*	.36*	.46*	.10
Receiving	R			.41*	.49*	.10
Ideas	I				.77*	.16
Guidance	G					.18
Liking	L					

* $p \leq 0.01$. Adapted from Bales & Slater (1955: 286).

See also Slater (1955: 615), table 3, which reports different figures, but demonstrates the same sort of logical pattern, and coefficients of a similar order of magnitude to those given above (reproduced in appendix A, table A.1 below. See also Burke, 1972: 523).

The results given in table 5.1. seem to be suggesting that role differentiation, (the bifurcation of the general leadership role into task and social specialisms), seems only to occur in groups that exhibit high degrees of status consensus (high SC groups),

whereas a trend towards independence of activity, task activity and Liking becomes pronounced when status consensus is low (low SC groups).

Table 5.1 above shows results which were averaged from a sample consisting of two 4-person groups, four 5-person groups, and four 6-person groups (i.e. 10 groups) meeting for four sessions (40 sessions total. Bales & Slater, 1955: 261). Data from four 3-person groups were excluded:

> "The use of rank order correlations here involves serious statistical problems, due to the small sizes of our groups. Clearly a rho drawn from a three-man group means very little, and rhos from even the larger sizes are not too reliable. In dealing with this problem two different techniques were used: (a) Median values were computed; (b) Means based on the raw rhos of all but the three-man groups were computed. While these methods yield identical results, neither is entirely satisfactory, and **we suggest that the reader accept these findings with reserve**." (Bales & Slater, 1955: 285, footnote 16. Also, Slater, 1955: 614, footnote 3. Emphasis added).

Point for point, all of the correlations within low SC groups are lower than those in the high SC groups:

> "... a result which is not surprising in view of the fact that low agreement between raters is equivalent to low reliability of measures, which would tend to produce lower correlations in the Low groups." (Slater, 1955: 614 - 615, footnote 4. Also Bales & Slater, 1955: 287, footnote 19).

It is worth pointing out, however, that the trend towards low correlations in the low SC groups is only a marked trend when Liking is involved. It might be asked, however, in what sense the low SC groups are "groups". It was noted earlier that for Bales the measure of consensus that he used was a measure of the group's culture (see p 181), and here he is explicitly denying that there

is a shared culture in these groups. Therefore, a further question can be raised about the coherence of any conclusion that discusses a structure, of any kind, in low SC groups, because, by definition there isn't one.

Nevertheless, despite the reservations mentioned earlier, Bales, and Slater, conducted a series of t-tests to test the differences between high and low groups (see figure 5.2 below).

Table 5.2. **Differences between High SC groups and Low SC groups on correlations between Talking, Receiving, Ideas, Guidance and Liking.**

(t-test +)

		T	R	I	G	L
Talking	T		n	*	*	*
Receiving	R			*	*	*
Ideas	I				n	*
Guidance	G					*^
Liking	L					

* $p \leq 0.05$. n = not significant.
+ unspecified which. ^ n.s. in Slater (1955).

Adapted from Bales & Slater (1955: 287) and Slater (1955: 615)

There is a slight difference of detail between the two sets of results reported by Bales and Slater (1955) and Slater (1955), although both indicate more or less identical trends. In both cases it is reported that all of the differences in the values of correlation between high and low SC groups are significant at the 0.05 level, "or better", with the exception of the Talking-Receiving correlations "(which are not based on ratings)" and the Ideas-Guidance correlations (Bales & Slater, 1955: 287, footnote 19 - see table 5.2). Slater further reports that in his results the difference between the Guidance and Liking correlations are

also not significant (Slater, 1955: 614 - 615, footnote 4. See appendix A table A.1 below). No explanation is offerred as to why these particular relationships do not yield significant differences.

On the basis of the fact that Ideas and Guidance (the task scales) seem to "display a fairly strong tendency to hang together even in the Low groups", the fact that there is no significant difference between correlations of Talking and Receiving,

> "... along with the existence of several [unspecified] High group-Low group differences which are not based upon ratings, suggests that unreliability of Low group measures plays little part in the creation of qualitative differences between High and Low groups." (Slater, 1955: 614 - 615, footnote 4. Also Bales & Slater, 1955: 287 - 288, footnote 19).

Most significant for Bales and Slater, however, is the fact that in these analyses Liking seems to separate off from all the other scales, and appears to be an independent factor (e.g. Bales, 1958). When analysed by means of a correlated t-test (Bales & Slater, 1955: 285), each of the mean correlation coefficients given in table 5.1. turn out to be significant at the 0.01 level, with the exception of those relating to Liking in the low SC groups. Even in the high SC groups, however, Liking is obviously much less strongly related to the other scales.

When the coefficients were compared <u>within</u> the matrices, that is, for example, when the correlation coefficients for high SC groups were compared to one another (and similarly for the low SC groups), it appears that those relating to <u>Liking</u> (L-T; L-R; L-I; L-G) <u>are significantly lower than all of the other coefficients</u>.

Bales & Slater, (1955: 287) report, in a footnote, that when the four Liking correlations were compared individually against the remaining six (T-R; T-I; T-G; R-I; R-G; I-G) making 24 comparisons each for both high and low SC groups, 14 of the possible comparisons for the high SC groups were significant, thus further suggesting that Liking is an independant scale. Similar figures are reported for the low SC groups, although they fail to point out that only 11 (that is just under 50%) of the possible comparisons are significant (Bales & Slater, 1955: 287. See appendix A table A.2 below). As explained in appendix A, however, the evidence is not very good, and there are errors in the reporting.

Slater (1955: 615) reports a different technique for testing the differences between the correlations within each correlation matrix (i.e. comparisons of all the coefficients for the high SC groups compared with each other, and similarly for the low SC groups). Without providing any rationale, he divided the coefficients given in table A.1 (appendix A) into three groups. Group 1 comprised of the T-R and I-G relations; group 2 comprised of T-I, T-G, R-I and R-G, that is the relations between participation measures and rated task "ability"; and group 3 comprised of L-T, L-R, L-G, L-I, that is the relations involving Liking. This is summarised in graphical form in appendix A below (table A.3). The three sets were then tested against each other by means of a sign test (Slater, 1955: 615).

The results, which are summarised in table 5.3 below, suggest, according to Slater, that:

> "Popularity ... appears to be the most specialised characteristic, regardless of the degree of status-

consensus in the group. In low status consensus groups, however, the tendency for Liking to separate itself from other characteristics is stronger, and seconded by the dissociation of rated task ability from amount of participation." (Slater, 1955: 616).

Without an adequate explanation of the basis for the analysis, however, this conclusion can be questioned.

Table 5.3. Significance levels of differences between correlation sets.

(Sign test)

High Status Consensus Groups.

	Set 1	Set 2	Set 3
Set 1		n.s.	.01
Set 2			.05
Set 3			

Low Status Consensus Groups.

	Set 1	Set 2	Set 3
Set 1		.01	.01
Set 2			.01
Set 3			

Set 1 = T-R, I-G. Set 2 = T-I, T-G, R-I, R-G.
Set 3 = L-T, L-R, L-I, L-G.

Adapted from Slater (1955: 615).

Thus, what the evidence claimed to show role differentiation amounts to so far is that Liking appears to be the "least stable" characteristic of those measured, and tends, according to Bales and Slater's interpretation of the results, to emerge as a separate dimension, particularly in the low SC groups. The evidence suggests, however, only a marginal trend, and some of it is contentious. Nevertheless, on the basis of this they conclude that:

> "... role differentiation in the High groups seems to be bipartite, with an active 'task specialist' and a Best-liked man [sic]. In the Low groups it tends to be tripartite (as well as more extreme), with an active participator who is neither well-liked nor highly rated on task ability, a more passive task specialist who is not well-liked, and a popular individual who is neither active nor highly rated on task ability." (Slater, 1955: 616. See also Bales & Slater, 1955: 288).

This is all highly inferential, not to say questionable, although to be fair Bales and Slater explicitly recognised the fact themselves (Bales & Slater, 1955: 288). They suggested that "additional light" could be thrown onto the problem by means of the "percentage coincidence method", which addresses itself to the percentage of cases in which persons occupying rank 1 on specified scales simultaneously holds rank 1 on other specified scales.

7. PERCENTAGE COINCIDENCE.

The simplest of the questions to be addressed using the percentage coincidence method is that of how many times an individual can be observed to hold rank 1 on one and only one of the specified scales. This is what Slater (1955: 613) refers to as "isolated prominence", and it is important to note in this respect that, for the purposes of this analysis, this provides the operational definition of the term "specialist":

> "A 'specialist' might be considered to be a man [sic] who achieves isolated prominence in only one of these areas" [i.e. Talking, Receiving, Liking, etc.]. (Bales & Slater, 1955: 277).

Slater's results, reproduced in table 5.4 below, suggest once again that Liking more often emerges as an independent factor. Similar results are also presented by Bales and Slater (1955: 277 - 278), which are reproduced in appendix A below (table A.6).

Table 5.4. Number of sessions* out of a possible 80 in which a given person holds top position in one and only one rank order out of five possible rank orders.

Talking	T	11.0
Receiving	R	10.5
Ideas	I	12.0
Guidance	G	11.6
Liking	L	30.4
TOTAL		75.5

* Decimals arise from ties in rankings.

Source: Slater(1955: 613)

Slater takes the results in table 5.4 to be evidence of tendencies towards specialisation. As he observes, the figures indicate that there are more cases in which the best-Liked individual holds top ranking in only that one characteristic than cases of any other kind of "isolated prominence", noting that the difference between Liking and the other four characteristics is significant at the .001 level, using a Chi Square test (Slater, 1955: 613. See also Bales and Slater, 1955: 277 - 278). From this he concludes, once again, that:

> "Popularity is apparently a relatively specialised achievement." (Slater, 1955: 613).

The percentage coincidence method was also extended to examine the number of occurrences in which a given individual held top position on two rank orders simultaneously. Again there are differences in the figures quoted. Those reproduced below in table 5.5 are taken from Bales and Slater (1955: 289); Slater's figures are reproduced in appendix A, table A.4.

Table 5.5. Percentage of total number of sessions (56 sessions) in which the same person holds top position in two rank orders at the same time +.

(Size 3 included)

High Status Consensus Groups.

		T	R	I	G	L
Talking	T		55.3*	69.6*	36.1	22.5
Receiving	R			46.4*	43.2*	33.2
Ideas	I				52.1*	27.5
Guidance	G					38.6
Liking	L					

Low Status Consensus Groups.

		T	R	I	G	L
Talking	T		57.1*	39.3	42.9*	33.2
Receiving	R			26.8	39.3	40.4*
Ideas	I				55.3*	15.4
Guidance	G					8.9
Liking	L					

+ Chance expectation for each cell is 24.6% for High SC Groups, and 22.5% for Low Groups. Those percentages significantly higher than this chance expectation, using a Chi-square criterion, are followed by an asterisk in the tables.

Source: Bales & Slater (1955: 289).
See also Slater (1955: 614), table 2 (reproduced in appendix A, table A.4).

The overall pattern of these results is very similar to those reproduced in table 5.1 above. As noted in both Bales and Slater (1955) and Slater (1955), Liking still apears to have the lowest association with all other measures, while the task measures tend to be "more highly interrelated" (Bales & Slater, 1955: 288).

Slater, in relation to his own figures (see appendix A) notes that the difference in relatedness associated with Liking is significant at the .001 level for both high and low SC groups, although Bales and Slater further note that there is overall less variation

between high and low groups in degree of interrelatedness when compared with the figures in table 5.1. Overall it appears that the two participation measures (T-R) are significantly less often associated with Ideas in the low SC groups, than in the high groups (0.01 level), and Ideas and Guidance are significantly less often associated with Liking in the low SC groups (0.01 level):

> "In other words, in the High groups high participation (Talking and Receiving) is associated with high rated task ability (Ideas and Guidance), but neither is strongly associated with Popularity. In the Low groups the association of high rated task ability with popularity is even lower (less in fact than chance expectancy), while the association of high participation with high rated task ability tends to break down." (Slater, 1955: 613 - 614).

These results, then, are taken as further evidence that role differentiation is bipartite when status consensus is high and tripartite when it is low.

8. CHANGES OVER TIME.

A further application of the percentage coincidence method was to test tendencies towards specialisation over time. As Slater puts it:

> "Common sense and sociological folklore would lead us to expect that any tendency toward role specialisation in these groups would increase over time, as the group became more highly 'organised' or 'structured'." (Slater, 1955: 616).

The two main sources treat changes over time slightly differently, so both sets of data are reproduced below. The first, and simplest, set, given in table 5.6 is taken from Slater (1955: 616); it shows the percentage of cases, by session, in which the person ranked top on Ideas is also rated top on Liking.

Table 5.6. Percentage of cases in which the same person holds top position on Liking and Ideas at the same time, by sessions.

Sessions			
1	2	3	4
56.5	12.0	20.0	8.5

* The trends for High and Low groups are identical

Source: Slater(1955: 616). Also Bales (1958: 441).

The trend indicated in table 5.6. is apparently significant at the 0.01 (Chi Square Test), and thus tends to give support to the proposition that, in both high SC and low SC groups, task and social specialisms become somewhat more separated over time, although it will also be noted that the trend is not consistently downwards. Indeed, it is not a systematic trend at all. Furthermore, it will be noted that this table uses only Ideas as the task measure. The rationale for this is given by Slater as follows:

> "The selection of Ideas rather than Guidance as the task measure ... is based upon the fact that it is in general less highly correlated with Liking, and thus in some sense 'purer'. Guidance and Liking do tend to correlate less with the passage of time, but the trend is more gradual, as we might expect." (Slater, 1955: 616).

Slater does not report figures for the latter trend, but data relating to this are given in Bales and Slater (1955). These are reproduced as table 5.7. below.

The trends shown in figure 5.7 are as follows: that between Ideas and Guidance is significant at the 0.05 level, that is slightly lower than in table 5.6., whereas that between Guidance and Liking is not significant at all. No comment is made about the last

result, but it implies that the separation of task and social areas is stronger in the more specific area of Ideas, rather than in the more general area denoted by Guidance.

It will be noted that there appears to be a major discontinuity between sessions 1 and 2, as there was in Slater's results (table 5.6). No comment is offered about this, nor about the general lack of a systematic trend overall. These results, although taken in both cases to be evidence that role differentiation increases over time, that is, that the task scales denoted by Ideas and Guidance separate over time from Liking, are really quite difficult to interpret in this way. They show no simple relationship at all.

Table 5.7. Percentage of cases in which the same person holds top position on Liking and either Ideas or Guidance at the same time, by sessions.

	Sessions			
	1	2	3	4
I - L	52.1	8.6	16.4	8.6
G - L	34.3	25.0	12.1	23.6

I: Ideas; G: Guidance; L: Liking

Source: Bales & Slater(1955: 278)

The final aspect of trends over time that are investigated is Slater's investigation of the relationship between participation and "task ability" in low SC groups. The results are reproduced as table 5.8 below. No rationale is offered for not doing the same thing with respect to high SC groups.

Table 5.8. Percentage of cases in low status consensus groups in which the same person holds top position on a participation measure (Talking or Receiving) and a task ability measure (Ideas or Guidance) at the same time*, by sessions.

Sessions			
1	2	3	4
55.0	28.7	41.3	30.0

* Using the mean of the four possible combinations.

Source: Slater(1955: 617)

Although it is pointed out that the trend indicated by the figures in table 5.8. is significant at the 0.05 level (Chi Square), no other comment is proferred. So quite what the table is meant to show, remains a mystery. It can be seen, however, that the same sort of discontinuity between the first and second sessions observed earlier, is evident in this table as well. Furthermore, the figures seem to be rather higher than one would have expected given the consistent suggestion that low SC groups display a tendency for scales to be independent. This suggests that there was, perhaps, more coherence within the low SC groups that Bales and Slater studied, than their analyses have shown, or were able to show.

9. THE ATTRIBUTION OF LEADER STATUS.

It will be recalled that at the end of the fourth (and final) session, group members were asked to rank order each other with respect to who "most definitely stood out as leader". This Slater describes as the "most generalised of criteria" (p 616 -617). Results from this question were computed by first identifying

persons top on each of the other measures (for all four sessions taken together), and then computing the percentage coincidence of top rating on leader status and each of the other measures. Thus it appears that Slater first computed an aggregate top status measure for each of the dimensions, therefore identifying persons who were overall highest ranked. No details are given, however, of how this was achieved. The results are given in table 5.9 below.

Table 5.9. Percentage of cases in which top rank on Leader status coincides with top rank on each of five other measures.

Talking	T	55.0
Receiving	R	65.0
Ideas	I	59.0
Guidance	G	80.0
Liking	L	25.0

Source: Slater(1955: 617)

A Chi Square test indicated that Liking coincided significantly less often with leader status than any of the other four characteristics (0.01 level), and in point of fact the best-Liked person was chosen as leader no better than chance expectation would predict (Slater, 1955: 617).

On the other hand, as Slater points out, leader status is most strongly associated with those characteristics which, in those results of his which have already been considered, are themselves most strongly associated with Liking, that is Receiving and Guidance (see tables A.1 and A.4 in appendix A below). It is noteworthy, however, that the same pattern is not apparent in the results presented by Bales and Slater, at least in respect of low SC groups (see tables 5.1 and 5.5 above).

Slater explains the result in terms of the general nature of Leadership, understood as a functional aspect of group working. As he points out, when group members choose a leader they have to take into account a wider range of "abilities and virtues" than simply whether a person has the best ideas, or whom they like best. This then leads into the proposition, discussed at several points earlier, that the:

> "... chosen leader of a group is perhaps the man [sic] who has the highest hypothetical combined rating on all possible characteristics related to the groups' purposes and needs." (Slater, 1955: 617).

As he further points out, such a person is unlikely to be disliked, to have unacceptable ideas, or to be inactive. All things being equal, therefore, ratings or rankings given in response to a question such as the Leader question, are likely to be more highly correlated with evaluations based on general criteria, such as Guidance, rather than on specific criteria such as denoted by Ideas. This once more underlines the point made several times earlier, that leadership is not synonymous with task activity.

10. BEHAVIOURAL DIFFERENCES BETWEEN SPECIALISTS.

One obvious objection to the interpretations offered by Bales and Slater of their results, relates to the operationalisation of the social specialist in terms of being best liked. As several commentators have pointed out, the relationship between the conceptualisation of the social specialist as a conciliator and the operationalisation as the best liked person is somewhat remote. Theoretically there are many reasons why a person might be rated as highly liked besides, and not necessarily connected with,

social activity (Gustafson, 1966, 1973; Mulder et al., 1964; Olmsted, 1959; Taguiri & Kogan, 1960; Theodorson, 1957; Wheeler, 1957). Bales and Slater were apparently sensitive to this weakness, since they conducted behavioural comparisons of persons rated best Liked and highest on Ideas using IPA. Again, Bales and Slater (1955) and Slater (1955) give different results; those reproduced below in table 5.10 are taken from Slater (1955: 618), principally because the sample size is the larger of the two. Results from Bales and Slater (1955: 279) are given in appendix A (table A.7).

In both sources the criteria given for selecting data for inclusion in the table are the same. First, all sessions in which the best-Liked person was also top on Ideas were eliminated. Second, all sessions in which ties for top rank occurred in either characteristic were also eliminated. This left 44 pairs for analysis (23 in Bales & Slater, 1955). The raw profiles (see Bales, 1950) of the remaining pairs were then added together, and percentage profiles calculated (Slater, 1955: 618; Bales & Slater, 1955: 278). It is these figures which are reproduced in table 5.10 (and A.7).

Trying to work out precisely what this means is not easy, but since the column totals are all 100, it becomes plain that the figures refer to intra-personal specialisation, and not to inter-personal specialisation. For example, where the figure 14.42% is given under the Ideas column, alongside the category "shows agreement", this indicates that, in general, those persons rated top on Ideas in this sample spent 14.42% of their time in agreeing with

others' suggestions; it does not indicate what proportion of the gross total of agreement, at the group level, Ideas people contributed. That is to say, these figures address the question of whether an individual is specialising qualitatively in terms of personal behavioural repertoire; they do not address the question of whether these persons are, in some sense specialising at the group level, a point for which they will be criticised later in chapter 7.

Table 5.10. Composite profiles in percentages of 44 persons ranked top on Ideas and 44 persons rated best-Liked for the same sessions.

(IPA categories)

		Initiated		Received	
	Interaction Category	I	L	I	L
Area A: Positive Social	1. Shows Solidarity	3.68	4.41	2.57	3.15
	2. Shows Tension release	5.15	6.98	7.95	9.20
	3. Shows Agreement	14.42	16.83	23.29	18.27
Area B: Task Attempts	4. Gives Suggestion	8.97	6.81	7.01	7.22
	5. Gives Opinion	32.74	28.69	25.52	31.00
	6. Gives Orientation	18.54	17.91	14.06	14.54
Area C: Questions	7. Asks for Orientation	3.04	3.71	3.62	2.80
	8. Asks for Opinion	1.84	2.94	1.94	1.74
	9. Asks for Suggestion	.93	1.33	.85	.84
Area D: Negative Social	10. Shows Disagreement	8.04	7.60	10.65	9.35
	11. Shows Tension increase	1.92	2.16	1.59	1.35
	12. Shows Antagonism	.73	.63	.95	.45

Adapted from Slater (1955: 618)
See also Bales & Slater (1955: 279), table 6, which is reproduced in appendix A, table A.7.

In some ways this table is crucial for interpreting the evidence in favour, or otherwise, of role differentiation, if for no other reason than that this, if valid, undermines the substantial criticism relating to the somewhat haphazard operationalisation of "social specialist" in terms of being best-Liked. It is quite

clear that, as far as Bales and Slater are concerned, the data demonstrate that the best-Liked person is enacting social-emotional behaviours, and more importantly is in some way <u>special-ising</u> in this area. There are, however, good reasons to dispute this claim, and these are addressed in the critical chapters below, in particular chapter 7. Of more immediate interest are the results of statistical analysis and the attendant interpretations that Bales and Slater offer.

First, Slater remarks that when the sample is divided into high and low SC groups there appear some "suggestive variations" to the pattern given above, although no details are given. He also remarks, however, that the "major outlines are the same", thus implying that his analysis of the results is pertinent to both cases.

According to Slater, the "most salient general difference" shown by table 5.10 is that the Ideas person seems to initiate interaction "most heavily" in the task area (area B) and the best-Liked person "most heavily" in the positive social area (area A). Obviously this is in line with the general thrust of his and Bales' arguments with respect to specialisation. The use of the superlatives might be seriously questioned, however, since, in relation to the figures in table 5.10, the claim of systematic and clear differences between the Ideas person and best-Liked person seems to be overstated. This is also taken up later in chapter 7.

Slater points out that testing the differences between these areas is "a vexed one", principally in view of the interdependence of the categories (p 619. Also Bales & Slater, 1955: 280). This is an

old problem, and one that seems continually to appear in small group research (Bales, 1951). Notwithstanding, he proposes three different techniques each one based on <u>individual</u> profiles, rather than the aggregate profiles presented above.

First category indices were calculated for each person based on the raw profiles. The index consisted of the total of acts initiated in area A divided by the total initiated in area B. Persons specialising in social acts should therefore have a comparatively high index, and those specialising in task acts a relatively low one. A sign test indicated that best-Liked persons had significantly higher indices than those rated top on Ideas (0.01 level. Slater, 1955: 619).

A second suggested index consists of placing all the categories in which the best-Liked person initiated most in the numerator, and all those where the Ideas person initiated most in the denominator. No other information is given about the technique, but apparently it yielded a significant result; best-Liked persons apparently had significantly higher scores (0.01 level; no test specified. Slater, 1955: 619).

Finally <u>individual</u> percentage profiles were constructed and compared, using the sign test, category by category for action initiated. This indicated that categories 2, 3, 4, 5, 8, and 11 differentiated Ideas specialists from best-Liked persons (Slater, 1955: 619), thus reinforcing results earlier found by Mann (1954. See also Mann, 1961). Grouping the categories by area, however, apparently produced stronger differences than those produced by

single categories. Thus Slater claims that there are systematic differences between Ideas and best-Liked persons in all areas except area D (negative reactions). Of this last area Slater remarks, somewhat dismissively:

> "In Area D, grouping does not seem meaningful, since the three categories do not tend in the same direction. The tendency for the Idea men to initiate more in categories 10 and 12 [shows disagreement and shows antagonism], however, is so weak that it may almost be discounted." (Slater, 1955: 620).

Unfortunately, because there are no further details of the results derived from the indices Slater's interpretations have to be taken at face value. It is worth remarking, however, that they do not relate directly to those figures given in table 5.10, even though they accompanied one another in Slater's text. The position is slightly different in the Bales and Slater text, although in the final analysis the reader is left in precisely the same position with respect to the possibility of critical scrutiny (see appendix A, table A.7. See also Lewis, 1972, 1973; Wheeler, 1957).

These results, then, are taken to constitute evidence that differences observed in group members' ratings of one another on the sociometric questions are accompanied by

> "... qualitative differentiation in the overt behaviour of the subjects rated, such that Idea men tend to specialise in active problem-solving attempts, and Best-liked men in more reactive, less task-oriented behaviour." (Slater, 1955: 620. See also Bales & Slater, 1955: 280).

It can be argued, however, that this claim is exaggerated. This point is addressed at greater length in chapter 7, but it is worth noting here that, first, it is not clear what "specialise" means in relation to these results, and second that in no sense do the results justify claims that there are any strong systematic differences between those whom Slater has identified as Ideas persons and those identified as best-Liked.

11. SUMMARY OF BALES AND SLATER'S EVIDENCE.

The evidence which it has been claimed shows role differentiation, consists almost entirely of evidence that Liking, as a dimension, seems to separate out as an independent factor from all of the others which Bales and Slater measured. In this respect figure 5.1. given at the beginning of the chapter is not merely a part of the evidence for role differentiation, it <u>is</u> the evidence. Notwithstanding, it appears that whether the task specialist is rated as best Liked in a group or not is, first, partly a function of whether he or she, in some sense, "overtalks", and second is related to the degree of status consensus within the group.

In this last aspect, when consensus is high it seems that role differentiation develops into a bipartite structure, consisting of an active task specialist and a less active (although still comparatively active at the group level) best-Liked member. The best-Liked group member seems, on average, to be the second or third most active group member. When consensus is low, the results, <u>as interpreted by Bales and Slater</u>, seem to suggest the development of a tripartite structure, consisting of an active individual who in terms of the role types given earlier (section 2e) could perhaps be described as an "overactive deviant", a task specialist and a best-Liked member. As noted earlier, however, the question arises as to whether low SC groups constitute "groups" at all, and whether, therefore, they can really be said to have <u>any</u> structure.

Further results, as Bales and Slater interpret them, seems to provide evidence that the tendency for task and social areas to separate becomes more pronounced over time, regardless of the degree of status consensus instantiated in the group. The evidence is, however, weak, since the results show no systematic trend, except for the appearance of a discontinuity between the first and second sessions, which Bales and Slater do not comment on.

When leader status attribution is examined, it appears that, like the task measures, it too tends not to correlate with Liking, although it does correlate with those measures with which Liking does correlate, namely Guidance and Receiving. For this reason Slater, at least, suggests that a factor of generality underlies the relationships, as opposed to the specificity of measures such as Ideas and Talking.

Finally, again as interpreted by Bales and Slater, behavioural analysis would seem to suggest that persons rated as best Liked in a group seem to specialise behaviourally in social activities as described by the IPA categories, and Ideas persons seem to specialise in task activities. Thus the model seems to be nicely completed. Once again, however, the results are messy and lack systematic effects. Furthermore, there are reasons to dispute the claim that these results address the question of role specialisation in a way that is relevant to the role differentiation hypothesis, a point which is addressed at more length in chapter 7.

CHAPTER 6: CRITIQUE OF BALES' METHODS.

1. INTRODUCTION.

The last chapter provided a detailed description of the empirical basis of the role differentiation hypothesis, as it appeared in the work of Bales and his colleagues. That account, as noted earlier, was deliberately descriptive, with a minimum of critical comment; the account that follows in this chapter and the next is intended to fill the critical gaps.

Although extended over two chapters the critique will follow the standard structure for empirical accounts, that is, "method", "measurement" and "results", in that order. Those aspects of Bales, and Slater's, work which relate to method and measurement, including operationalisations, will be dealt with in this chapter, and their results will be addressed in the next. For convenience the material will be presented in roughly the same order as in chapter 5, so that the description and critique map directly onto one another.

There are, broadly, two jobs which the critique is intended to do. First it is essential to identify those conditions, if any, that Bales identified as limiting the scope of the role differentiation hypothesis to particular sets of circumstances, and which there-

fore constitute the criteria by which subsequent attempts to study role differentiation may be evaluated as "fair tests", or otherwise, of Bales' work. Second, an independent critique needs to be constructed by which both Bales' work and subsequent studies can be evaluated for consistency and validity.

Accordingly, the structure of each of the sections below is as follows. In each case the first question will be whether Bales has presented any clear limitations on the scope of the role differentiation hypothesis, explicit or implied, followed, in most cases by a general discussion on each of the topics aimed at developing a wider critique of both Bales and his commentators. There are thus three foci for the critique. First, relating to implications for the interpretation of Bales own work, in particular the generalisability and interpretability of his results. Second, implications for further studies of the role differentiation hypothesis within the literature, that is the construction of criteria by which they may, or may not, be considered as fair tests of the hypothesis in Bales' terms. And third, the implications of these critiques for the interpretation of existing results, and the development of the studies which form the empirical substance of this thesis.

It will be shown that with respect to method and measurement there are identifiable problems in Bales' work, although the extent to which these problems are serious varies. Major problems exist in Bales' measurement techniques, the means by which he derives summary status orders, and in the operationalisation of role types and status consensus. It will be argued that the problems which

are apparent with his measurement procedures undermine the whole basis of his empirical results as typically presented in the literatures. Later, in the next chapter, it will also be demonstrated that there are sufficient problems relating to Bales, and Slater's, published results in support of the role differentiation hypothesis to warrant an overall conclusion that first, much of the Bales' empirical evidence is uninterpretable in the light of his own conceptual formulations (described in chapter 2), second, that Bales does not present any good evidence in favour of the role differentiation hypothesis, and third, more strongly, that the role differentiation hypothesis has not been tested in his work at all.

2. METHOD.

The following three sections are concerned with issues relating to Bales' method. These are principally concerned with the kinds of groups he used, his subject sample and the nature of the task which he set them. It is suggested that in respect of the kinds of groups he was focussed on Bales presents a clear restriction on the scope of the role differentiation hypothesis. In respect of his subject sample he presents a second requirement for subsequent research by attempting to ensure that his subjects were unacquainted. It is noted that his use of undergraduates has been criticised, although it is argued here that this is not necessarily fatal to his work. His exclusive use of male group members is noted, and discussed. Finally, it is argued that the unstructured nature of the task confronting his subjects is an important element in his methods.

2.1. GROUPS.

The nature of the kinds of groups that Bales was concerned with has already been addressed in some detail in chapters 2 and 3 above, but it will be useful to recap here briefly. Broadly speaking Bales was explicitly concerned with small, face-to-face discussion groups, and it is with this focus in mind that he conducted his research (Bales, 1950 a. See chapter 2, section 2, above). Burke (1972) later added the stipulation that the groups should be engaged in tasks that require interdependent co-ordinated activity, and there is no reason to suppose that Bales would have dissented from this.

Thus, very early, and very clearly, Bales limits the scope of the role differentiation hypothesis to a particular kind of group. It is important to realise, however, that he also identified what he considered to be appropriate anthropological correspondences with "primitive" cultures, and tentatively extended the scope to include other groupings such as families (Bales & Slater, 1955), and committees (Bales, 1955). He therefore obviously saw a wider applicability for his results than just the small group. Nevertheless, since this was largely speculative, and because his empirical examination of the role differentiation hypothesis was exclusively concerned with small face-to-face groups, then any subsequent fair tests of his work must be similarly focussed.

2.2. SUBJECTS.

With respect to his subject sample the first question to ask is whether Bales made any restrictions, explicit or implied, on the

role differentiation hypothesis in terms of the kinds of people that comprised the membership of his small groups. That is, was there a particular population, identified by Bales, for whom he considered the role differentiation hypothesis was relevant, and by extension others for whom it was not, or for whom no comment could be made? The answer is no. In particular he did not identify populations for whom he considered it not relevant.

It will be recalled that Bales' subject sample consisted of unacquainted male undergraduates. He makes no comment on why he chose this kind of sample, but it is a fair assumption that his reasons were much the same as those of other researchers who have used similar samples; namely that they were the most easily available subjects. For this, like many of the experimentalists of the fifties, he has been criticised (e.g. Gustafson, 1966, 1973; Gustafson & Harrell, 1970; Turk, 1961, a & b; Verba, 1961; Wheeler, 1957).

There are three significant aspects to this subject sample. The **first** relates to the fact that they were largely unacquainted at the beginning of the study. The **second** relates to the fact that they were undergraduates, and the **third** concerns the fact that they were exclusively male. These will be taken in turn.

a) On the use of strangers.

The first aspect, the use of strangers, can be dispensed with immediately. As was noted in chapter 5 it was a deliberate decision by Bales to try and ensure that acquaintance amongst subjects

was as low as possible, so as to observe role differentiation from some minimum starting point (Bales & Slater, 1955) by excluding as many factors as possible which might structure interaction a priori (see also Gibb, 1950). This may also have be the reason for studying single-sex groups, although Bales doesn't address the issue. Thus, the use of strangers does not constitute a problem in relation to his research. On the contrary it is an essential starting condition, and therefore constitutes a fundamental requirement of any subsequent fair tests of the role differentiation hypothesis, if conducted in Bales' terms.

Criticisms, such as those made by Verba (1961), that the "ahistorical" nature of Bales' groups (exemplified by their being composed of strangers) might stimulate role differentiation, because of the absence of legitimation of task activity by particular group members, do not undermine Bales' work. Such comments can be taken simply as an added restriction on the scope of the hypothesis; namely that it might more appropriately apply to newly formed groups which still have to establish, in the terms introduced in earlier chapters, an acceptable social order, than groups with an established history. The whole point is, however, to contrive a situation in which the emergence of order can be observed, and recorded.

b) On the use of undergraduates as subjects.

The second aspect of the criticisms needs to be assessed more carefully. In recent years the use of undergraduate subject samples has been increasingly criticised, usually as part of a broader critique of so-called "positivistic" methods in general, and laboratory based studies in particular (Gauld & Shotter, 1977; Potter & Wetherell, 1987; Harré, 1979, 1984; Harré & Secord, 1972; Shotter, 1975, 1986, 1987 a, b, c). It is not, unfortunately, possible to explore the wider issues in depth here, because it would be a diversion from the main purpose of the chapter. Nevertheless some discussion is necessary here, but it will be restricted only to those issues relevant to the foci of the chapter.

Principally, the objection to the use of undergraduates revolves around the subsequent generalisability of any results derived. It is generally alleged that because undergraduates represent a very narrow sample of the population as a whole, in terms of age, socioeconomic background, IQ range, and so on, then the results of studies using undergraduates cannot reasonably or validly be assumed to generalise to other population samples, except perhaps to other undergraduate samples. Thus in terms of Bales' work evidence supporting the role differentiation hypothesis can legitimately only be generalised to student groups. Or so one version of the argument goes (Harré, 1979, 1984).

Such arguments cannot be dismissed lightly, although they are not as well formed as some might imagine. Similar questions concerning external validity can be raised against all samples, and therefore no one piece of research is immune. Indeed, the problem of whether and how one might generalise from any sample to a wider population is well known, and, other than probabalistically, it seems to be intractable (Edwards & Pap, 1973, section 2; MacRae, 1988; Nagel, 1979; Russell, 1912; Swinburne, 1974). Obviously this is why statistics, if used properly, are not only useful but essential.

Nevertheless, there is some reason to be concerned that the attributes of subject samples might introduce systematic bias into results (Nunnally, 1967), and on these grounds the exclusive use of undergraduates has to be queried if one wishes to generalise to the wider population at large. This assumes, of course, that undergraduates constitute a homogeneous population which is somehow different in significant, systematic and reliable ways from the general population. On the other hand there has never been a systematic study of the ways in which undergraduates differ from the population at large, or even a good definition of what the "wider" population is. The alleged factors which render undergraduate samples invalid remain just that, alleged. Moreover, although it can be argued that undergraduates represent a narrow sample base in relation to the population as a whole, within the undergraduate population itself there is wide variation. As one commentator put it recently, undergraduates come from widely differing backgrounds, and have widely differing abilities, expectations and values. In short it can be argued that undergraduate populations have more internal variation than, for example:

> "... elitist business communities, parochial factory workers, pretentious yuppies and isolated farm communities who live a far more myopic and stultifying existence than the universities." (Hulme, 1986).

The real acid test of whether undergraduate samples are in some sense appropriate, however, is related to the purposes for which the research is being conducted, and subject samples need to be chosen carefully in the light of these purposes. Obviously one should not try to generalise willy-nilly from any sample to any population. That is to say, research of this kind needs to be

focussed, indeed focussed more precisely than is obvious either in Bales' work or more generally (see 1 chapters 3 and 4 above).

The problem with Bales' use of undergraduates was that he was not careful enough about assessing the restrictions on generalisability that this might imply. Indeed, it is not obvious that he saw any such restrictions, and, as noted earlier, it seems likely that he at least considered it possible that his results might be generalised quite widely (Bales, 1955, 1958). On the other hand, fault lies as much with commentators and others who try to take his results further than warrantable. Prime examples of this are attempts to incorporate Bales' findings on role differentiation wholesale, and uncritically, into the management literatures (see for example Buchanan & Huczynski, 1985; Gordon, 1987; Mitchell, 1982; Senger, 1971).

For the purposes of the original empirical research reported in this thesis (chapters 9 to 13 below), the fact that Bales used undergraduates is not a problem. The kinds of groups mentioned in chapter 1, for example, were predominantly composed of graduates, or people of similar educational experience. Bales' groups, although restricted to men, are in some ways a better research base for understanding these kinds of groups than, for example, "natural groups" composed of officer candidates (e.g. Bass, 1949) student nurses (Turk, 1961, a & b) or American football teams (Rees & Segal, 1984). It is therefore simply not good enough to allege that the use of undergraduates invalidates the research because of some imagined, or alleged, 'unreality'; the validity, or otherwise, of a sample has to be assessed in context. This raises yet

again a point made much earlier in the thesis; **conceptual analysis** is <u>critical</u> in this kind of work.

The question still remains whether a fair test of the role differentiation hypothesis requires that an undergraduate sample be used. Strictly speaking the answer is yes. Indeed, in strict terms to replicate Bales' studies his procedures should be copied exactly. But in view of the fact that to be worthwhile a proposition such as the role differentiation hypothesis should have reasonably wide application, and in view of Bales lack of comment about his use of undergraduates, it would be unreasonable to claim that the use of subjects other than undergraduates prevents a study from being considered a fair test.

c) On the exclusive use of male subjects.

Relevant to the issue of the exclusive use of male subjects, is the suggestion that role differentiation may occur along the lines of gender divisions (although the facile equation of social-emotional behaviours with the "female" or "mother" role, and task behaviours with the "male" or "father" role, is too glib to be taken very seriously - Grusky, 1957; Leik, 1963; Levinger, 1964; Meeker & Weitzel O'Neil, 1977; Strodtbeck & Mann, 1956; Zelditch, 1955). This relates to the point made earlier (see pp 215 - 216), that mixed sex groups may contain structuring factors which systematically affect the development of role differentiation within groups, and on these grounds use of a single-sex sample can be justified. Nevertheless, an exclusively male sample is very restricted, and as a consequence it limits the scope of justifiable claims about the empirical incidence of role differentiation.

It would be unreasonable to criticise Bales too harshly here; no single piece of research can be expected to cover all eventualities and variations, and at least by <u>declaring</u> the specificity of his subject sample, Bales has left the way open for a systematic study of role differentiation along gender lines. Nevertheless, since the issue has been raised, any studies which aim to test the role differentiation hypothesis in Bales' terms, and which use either mixed or female samples, should be careful about declaring the fact so that their results can be set alongside Bales' work as a partial extension of the empirical testing of the hypothesis.

2.3. TASK.

In relation to the task, the first question to ask, as earlier, is whether Bales made any stipulations on the nature of the task which might have a bearing on the scope of the role differentiation hypothesis. Again the answer is no. Thus one might legitimately conclude that one could test the hypothesis using any kind of task. There are, however, some qualifications to this conclusion.

Although, as noted earlier, the precise details of the tasks set by Bales is not clear, nevertheless certain things are apparent, and they need to be noted. First, as Burke (1972) notes, the kind of task undertaken by Bales' groups was intended to stimulate interdependent co-ordinated activity. More precisely Bales concentrated primarily on verbal interaction. Second the tasks used by Bales were intended to take <u>time</u> to solve. Third, and most important, on the basis of what little evidence there is, the tasks had what Fiedler (1967) calls "low task structure".

That Bales gave little or no information about how to tackle the problems that he set his groups, indeed that he took pains to ensure that subjects weren't even able to compare the amount of information each had, indicates the comparative lack of structure to the problems, and reinforces the point that they were principally verbal tasks. Furthermore, the kind of "open-ended" human relations problems, of the sort apparently used by Bales, had no obviously "correct" solutions, since they relied as much on personal values and opinion as on fact. In other words, they had what Shaw (1971, 1973) calls "solution multiplicity", and, comparatively speaking, "low goal clarity" (see also Stein & Heller, 1979).

On the assumption that the nature of the task may have an appreciable affect on interactional dynamics (Mann, 1961; Marcus, 1960; Wilson, 1969), it becomes plain that fair tests of the role differentiation hypothesis in Bales' terms, need to employ tasks of a similar nature to those used by Bales. In this case, therefore, the tasks should be principally discussion tasks, with no obvious solution specificity (Shaw, 1971, 1973; Stein & Heller, 1979), or, in other words, with a multiplicity of solutions any of which could be regarded as "correct". Naturally the role differentiation hypothesis could be tested using other kinds of tasks, but in that case it would not constitute a test of the hypothesis in Bales' terms.

3. MEASUREMENT PROCEDURES.

Turning now to the measurement procedures used by Bales, this section addresses issues relating to the questions Bales asked his

subjects, the empirical descriptions of his main concepts, including role specialists and status consensus, and, briefly, his method for deriving empirical summaries of group structure. It will be argued here that the form of the questions asked by Bales, particularly the mixed use of rankings and ratings, and his inclusion of self ratings in some measures and exclusion in others, introduce far too many areas of unexplained variance into his data. His role definitions will be criticised on the grounds of unacceptable vagueness, and finally his application of Kendall's W to the task scales alone will be questioned in the light of his conceptual formulations. In sum it is suggested that basic flaws in Bales' measurement procedures undermine the set of interpretations he, and others, have made of his empirical results. This conclusion has important implications for the reassessment of Bales' evidence in relation to the occurrence of role differentiation; the reassessment of the results of other existing studies of role differentiation; and for the approach adopted in relation to the analyses undertaken on the empirical work undertaken as part of this thesis.

3.1. THE SOCIOMETRIC QUESTIONS.

When addressing the kinds of questions that Bales asked his subjects, commentators typically concentrate on just two aspects; his use of rankings, and his use of the one measure Liking to identify social specialists (Burke, 1967, 1968, 1969; 1972; Gustafson, 1966, 1973; Smith, 1963; Taguiri & Kogan, 1960; Theodorson, 1957; Wheeler, 1957). There are, however, other important aspects which are overlooked, and which have important implications not only for the acceptance, or otherwise, of Bales' method and

results, but also for the evaluation of other studies which claim to be tests of the role differentiation hypothesis. Of some importance here is the very nature of the questions Bales asked.

It will be recalled that Bales asked five different questions of his subjects, summarised as Ideas, Guidance, Liking, Disliking, and Leader status (see pp 175 - 176 above). The "task" and "leader" questions (Ideas, Guidance and Leader status) required respondents to rank order all group members, including themselves, whereas the "social" questions (Liking and Disliking) required respondents to give ratings of other group members, excluding themselves. There is thus a very clear split between, broadly speaking, task related questions and socially related questions.

There are two important issues which need to be addressed here. The **first** relates to the use of mixed measures, which breaks down into two areas; the joint use of rankings and ratings in the same analysis, and the joint use of measures some of which include self ratings and some of which exclude them. This is addressed in the next section. The **second** aspect relates to the use of rankings for part of the measurements. This will be addressed later in section 3.3 below).

It will be argued here that Bales' measurement procedures substantially undermine the validity of his interpretations, and therefore of his conclusions, and that other results claimed to test the role differentiation hypothesis using similar measurement procedures therefore similarly lack validity.

3.2. ON MIXED MEASURES.

The first thing to note about this use of mixed measures is that it implies that, as far as Bales was concerned, it apparently didn't matter very much whether rankings or ratings were used. The further implication being that the role differentiation hypothesis could be tested using any variation involving rankings or ratings with or without self ratings. Underlying this, of course, is a necessary assumption that whatever measures were taken the result would, broadly speaking, be the same. Therefore, studies which claim to be fair tests of Bales, and the role differentiation hypothesis as he conceived it, can legitimately use any form of measure, in terms of rankings or ratings and self ratings, although for reasons to be given later ratings would appear to be preferable.

However, it is argued here that there are good reasons for questioning this set of assumptions, revolving around two interrelated areas of concern. The first being the legitimacy of using mixed measures in strict statistical terms, and the second, perhaps more important in terms of what Bales and others were trying to measure, the effects that different kinds of measures have on results. These are taken in turn.

a) Incommensurability.

Despite the fact that Bales converted his ratings scales to rankings for the purposes of some analytical procedures (Bales & Slater, 1955: 262, note 4; Slater, 1955: 612, note 2), and that on other occasions he converted rankings into a form of scale for

other purposes (Bales, 1958: 445, fig. 3) in strict statistical terms the sociometric scales denoted by the questions are incommensurable both in form and content. That is to say, they have no common basis upon which direct comparison can be made, because they differ in respect to the quality of evaluations required and whether self evaluation is included or not. In the one case a comparative within group evaluation is requested in ordinal terms (rankings), and in the other some more independent 'universal' criterion is being applied, such that each person evaluated could receive equal evaluations (ratings).

Even so, as is obvious from the last chapter, much of the evidence Bales presents in favour of the role differentiation hypothesis is based precisely on intercorrelations calculated between scores obtained through rankings (Ideas and Guidance) and scores obtained through ratings (Liking), including the most basic evidence of all, that displayed in figure 5.1. above. There are thus clear grounds for being concerned about the statistical validity of at least some of the results derived from these questions, and in turn, therefore, any conclusions drawn from them are also highly questionable.

It might be argued in turn, of course, that Bales' conversion of his data, from ratings to rankings, for example, renders his scales commensurable by giving them a common basis. There is reason to suppose, however, that the kind of data transformation involved can have a severely distorting effect on the final result (Prince, 1983, 1987), and it is worth noting that some statistical theorists also question the basic legitimacy of converting ratings

to rankings at all (MacRae, 1988; Stevens, 1951). Moreover, the inclusion or exclusion of self ratings can also create quite dramatic effects (Jones, 1959). Thus, the objection is not made purely on the grounds of statistical theory; there are good practical reasons why one would wish to question the use of mixed measures.

b) The practical effects of different measures.

This is not the appropriate place to address the full implications of the different measurement procedures, but some comment is essential, because it underlies the critiques of Bales' results, and those of other researchers, and also informs the analytical procedures adopted later in the thesis.

It can be demonstrated that summary status orders derived from mean ratings differ, in some cases dramatically, from those derived from mean rankings based on the same data (Prince, 1983, 1987). A simple example should suffice to illustrate the point. Consider the following set of ratings, arranged in a matrix of two rows:

	100	75	50	25	0
	47	48	50	46	49
$\bar{X}$	73.5	61.5	50	35.5	24.5

On the basis of these results, the derived summary status order would be:

{1; 2; 3; 4; 5}

Consider the same results expressed as rankings within the rows:

	1	2	3	4	5
	4	3	1	5	2
$\bar{X}$	2.5	2.5	2	4.5	3.5

from which the derived summary status order would be:

{2.5; 2.5; 1; 5; 4}

Obviously these figures are contrived, but similar observations can be made when other methods of data manipulation are employed (Burke, 1972; MacRae, 1988; Prince, 1987; Reidesel, 1974), and when self ratings are included or excluded (Jones, 1959; Prince, 1987. See also appendix J). That is to say, the assumption that the use of rankings or ratings makes no difference to the outcome of analysis is clearly false.

c) Implications of different measurement procedures.

In terms of Bales' work the implications are immediate and severe. **First** it calls into question **all** of his quoted correlations, untraceable, as they are, in relation to the original raw data. **Second**, because of these sorts of problems, the derivation of summary status orders is brought into question. That is, the question is raised about how one might **validly** identify the emergent status order of a group, and in particular **who comes top** on any particular scale. This calls into question the whole basis of results derived by Bales from the "percentage coincidence method", and his later IPA analysis of "specialists", as he defined them.

In fairness, it should be noted here that although Bales does not address these issues precisely, he is nevertheless aware of, and

explicit about, many other statistical problems which occur in his work. It will be recalled, for example, that he was careful to warn his readers of difficulties with some of the results described in the last chapter (see Bales & Slater, 1955; Slater, 1955. See also Bales, 1951). Notwithstanding, for the moment it is important to note that there **is** a problem with the nature of the questions asked by Bales, so fundamental indeed, that it calls into question **all** of his empirical results as presented.

These arguments have several implications. It is very clear that attempts to test the role differentiation hypothesis in Bales' terms cannot use precisely the same measures, and analytical procedures, as he did. It would be pointless because the same problems would then be transferred wholesale. At its most basic the questions asked need to be brought into commensurability, that is they should be consistently based on either rankings or ratings, **but not both**. They should also consistently include or exclude self ratings.

The wider implications suggest, however, that **any** piece of research that attempts to study role differentiation through the use of **simple** means, whether of rankings, ratings, or some other variation, can be called into question on the grounds that they may be based on summaries of emergent structures that are artifacts of the method rather than "true" descriptions of the structure (Pollay, 1968). This, as it will be obvious, is a fundamental, and extremely far reaching issue.

3.3. RATINGS VERSUS RANKINGS.

Bales has been criticised for his use of rankings, in relation to the task and leader questions, in his attempts to discover and describe a group's emergent structure (Burke, 1972; Lewis, 1972; Wheeler, 1957). Burke in particular has pointed out that although rankings allow group members to indicate relative evaluations of other group members, they do not allow group members to indicate the amount by which they evaluate the other members (Burke, 1972. See also Riedesel, 1974; Wheeler, 1957). Put a different way, although rankings may allow one to make inferences about the direction in which a group may be structuring itself with respect to its members, it does not allow one to draw conclusions in regard to the level of differentiation. For example, assuming a scale of 0 - 100, the following ratings would be treated as equivalent if they were to be transformed into rankings:

1) 100; 43; 40; 0
2) 10; 9; 8; 7

Each of these would appear as:

3) {1; 2; 3; 4}

or

4) {4; 3; 2; 1}

depending on which system of ranking was adopted. But clearly, in psychological terms the two sets of ratings indicate rather different things. In particular one might wish to conclude that set (2) above indicates that there has been no differentiation amongst members, and that therefore the group has not developed hierarchical structuring. Indeed, in view of the very low level of the ratings in relation to the maximum possible score (100), one might

draw the stronger conclusion that no structure has developed at all. It might be noted that the possibility that summaries might indicate the lack of any structure is typically ignored in empirical studies of emergent leadership (Prince, 1987).

In other words, by using rank orderings instead of some form of ratings Bales effectively masks important information about the group and its structure. In stronger terms he treats as equivalent quite dissimilar sets of circumstances, but because he uses rankings he allows neither himself nor anyone wishing to study his results the opportunity of making the distinction in relation to his results. More important, he may inadvertantly be treating groups with very pronounced structural evolution as equivalent to those with no structural emergence, and quite clearly these ought to be treated as different.

Related to these issues is the fact that by using rankings, and in particular mean rankings, as his method of summarising a group's structure (in relation to the particular scale measured), Bales also casts his enquiry in such a way that almost inevitably he will discover some form of simple hierarchy. For example, because he ignores the amount by which a person whom he identifies as top is top, and concentrates simply on the bare fact that, as far as his measures are concerned, they are top, then a simple hierarchy is just about all he can identify, unless there are ties. It must be stressed that this will be in relation to one particular sociometric scale only, as is obvious from the fact that he is able to report differentiated roles at all. Nevertheless, he cannot discover other, more complex structures in relation to these scales

because his system of measurement does not allow him to (see chapters 2 and 3 above. Also Prince, 1986 a, b).

Thus, to summarise this section and the last. It has been argued that Bales' mixed use of rankings and ratings render his task and social scales incommensurable from the outset; rankings and ratings measure different things (MacRae, 1988), and they can, under some circumstances give dramatically different results based on the same data, a point which was illustrated by example, and which will be examined in more detail later. It has also been pointed out that the inclusion or exclusion of self ratings can have a dramatic effect on results, and therefore by using both kinds of measures side by side, Bales has introduced yet another aspect of incommensurability into his measurements, with clear practical implications. Finally, arguments against the simple use of rankings were presented, which suggested that a summary order based on mean ranks alone could mask important aspects of group structure, and may treat as equivalent quite dissimilar group situations.

In sum, Bales measurement procedures introduce so much noise and statistical detritus into the analysis from the outset, that his results must be regarded as highly questionable. Furthermore, because different summary status orders can be associated with the use of ratings or rankings, there is a problem relating to the identification of that person, if any, who does come top on a scale. This has been partially demonstrated here, although more detail needs to be presented to assess the full implications. It can be seen, however, that there is a very real problem in relation to this kind of research. The implications are first, that

Bales' results cannot be taken as good evidence of role differentiation, even where apparently strong, and second, that any research which uses Bales' methods without some modifications is similarly suspect; for our immediate purposes it is enough to say that without more sophisticated procedures, the evidence for role differentiation will remain weak.

4. ROLE DESCRIPTIONS.

The operational definitions of role types offered by Bales (see p 178 above), are, on the face of it fairly precise, and tied in directly with the basic analytical dimensions also described earlier (p 176 - 177 above). On closer examination, however, they turn out to be less precise than they appear at first sight, which renders them less useful as operational definitions than they might be.

First, it might be noted, there is a lack of clarity in the use of the term "role". It is sometimes used to refer simply to the scales defined by sociometric questions Ideas, Guidance and Liking (see Bales, 1953a: 473), and at other times, as in the list presented on p 178 above, it refers to a pooled cluster of sociometric dimensions.

Second, the use of the imprecise descriptions "high" and "low", in relation to the three factors which constitute the basic analytic dimensions, Activity, Task ability and Likeability, is not particularly helpful. For example, the "Great Person" role is described as high on all three, and the social specialist as "high on

Likeability, but less high on task ability and activity (Bales, 1958: 447). This is, however, far too vague to be of much use. The problem is that the use of "high" and "low" in this context tends to blur the distinctions between the different role types. For example, consider a situation in which a person is most active within the group, i.e. top on activity, is rated top on Ideas and Guidance, but rated only second on Liking. Is an example of a "Great Person" or a "task specialist"? By the definitions given on page 178, he, or she, could be either. But, it seems to be fairly clear that for Bales this is an example of a task specialist, <u>not</u> a "Great Person". Therefore, the definitions need to be tightened to the extent that what is clearly intended by Bales is not that the person should merely be "high" on whichever scale, but <u>top</u> (Borgatta, Couch & Bales, 1954).

This, however, presents a problem in relation to the evaluation of activity levels. If it were to be insisted that, for example, a "social specialist", as defined by Liking, should be "top" on activity, then, in most circumstances, there could be only one specialist of any kind in a group, because probabilistically it is only a remote possibility that two group members will be equally active (Bales, 1953 a; Bales et al., 1951; Lewis, 1970). Therefore, <u>in terms of activity rates</u>, one is forced back onto the relative term "high" as part of the characterisation of the role types "task specialist", "social specialist" and "Great Person". Nevertheless, discrimination between different role types is still possible, because it can be described purely in terms of evaluations according to the sociometric criteria Ideas, Guidance and Liking, and this seems to be broadly what Bales had in mind.

Note, however, the implications of this. It means that, although behavioural evaluation, in this case in terms of gross activity levels, plays <u>some</u> part in the identification of persons adopting particular roles, it is, nevertheless, subsidiary to the <u>perceptual</u> evaluations in terms of the sociometric criteria described above. Thus, in Bales' terms a task specialist is someone who is rated <u>top</u> on Ideas (and possibly also Guidance), but is not top on Liking. He or she also needs to be active within the group, although it is arguable to what extent this is a necessary criterion if the group has evaluated them as top in relation to the task scales. A "social specialist", again in Bales' terms, is someone who is rated as best-Liked, but is not top on either of the task criteria; a "Great Person" is both top on Ideas (and possibly Guidance) and best-Liked.

Bales' use of vague terms such as "high" in this context indicates some equivocation on his part; he is never very clear about what he means by the term "specialist". In point of fact two quite different senses of the term can be distinguished in his writing and analysis, although he never makes the distinction clear himself, and frequently confounds them. We turn to this next.

5. DIFFERENT MEANINGS OF THE TERM "SPECIALIST".

As noted above, there are at least two different senses of the term "specialist" as Bales uses it. The first refers to someone who for example, only ever engages in task activities, perhaps as a personal preference; the second refers to a person who, more than any other group member, makes the major contribution to the

task activities of the group, when judged relative to the other group members, but does not necessarily engage only in task activities. The first case can almost be viewed as a personality variable. The second is an undeniably social concept relying as much, or more, on the perceptions and expectations of the rest of the group's members, as it does on the behaviour of the "specialist" thus construed. By this view "specialist" is to be understood in pretty much the same sorts of terms as it was argued earlier that "leader" should (see chapter 4).

The two meanings should be clearly distinguished. So, although not entirely adequate, the following terms will be introduced. The first sense of "specialist", the person who largely engages in one sort of behaviour, or is seen in this way, will be called an "intrapersonal" specialist. The second, which is the more important sense in terms of the role differentiation hypothesis, will be referred to by one of the following: "interpersonal" specialist; "group" specialist; or simply specialist. Any of the terms may be prefixed by a qualification such as task or social. It is essential to emphasise that the two senses of the term are not equivalent, and that one cannot validly make inferences about the one from the other. Amongst other things this has implications for the IPA analysis of "task" and "social" specialists which Bales and Slater conducted, as will be shown later.

To try and make the distinction clearer, taking as an example task specialisation, the following theoretical descriptions can be distinguished in relation to the quality of behaviour, as perceived or enacted, of any particular individual within a group:

a) Intrapersonal task specialist, but not interpersonal task specialist: someone who only engages, or is only seen to engage, in task activities, but someone else makes a higher level of task contributions within the group.

b) Interpersonal task specialist, but not intrapersonal task specialist: someone who makes the highest level of task contributions within the group, but also contributes in other areas aswell.

c) Neither intrapersonal, nor interpersonal task specialist.

d) Both.

There remains the problem, because of this confusion of the two senses of "specialist", about what it is that a "fair" test ought to be testing, that is whether the role differentiation hypothesis can be tested in terms of intrapersonal specialisation, or whether it can only be tested in terms of group specialists. In some ways it would be legitimate to test it either way, because Bales is so confused on the matter. Reference to his conceptual formulations, however, make it abundantly clear that whatever Bales' own confusion on the matter, when he refers to "specialists" he has in mind what is here called group, or interpersonal, specialists - the second sense of the term. Amongst other things this is made clear when it is considered that Bales was concerned to explain his role analysis in terms of functional contributions to the group, and, as remarked above, these cannot be inferred from a simple proposition about personal preference for behavioural specialisation (see chapters 2 and 4 above). Thus studies which aim at an analysis in terms of intrapersonal behavioural specialisation are not testing the role differentiation hypothesis as Bales formulated it.

6. STATUS CONSENSUS.

The concept "status consensus" is important in relation to the role differentiation hypothesis. Bales regarded it as of sufficient importance that he suggested that groups exhibiting different degrees of consensus should be treated separately (Heinicke & Bales, 1953; Bales & Slater, 1955 - see pp 179 - 181 above). More important, he suggested that the pattern of role differentiation would be contingent on the degree of consensus within the group (Bales, 1958; Bales & Slater, 1955; Slater, 1955). Thus status consensus is properly regarded as an important qualification to the role differentiation hypothesis, and therefore fair tests should take it into account.

This much is uncontroversial, indeed, had Bales not included some such measure, then, in the light of arguments introduced in chapters 2, 3 and 4, it would have been necessary to introduce one. Nevertheless, there are problems with the way that Bales chose to operationalise the concept, and these are sufficiently important to give further grounds for questioning his results.

It will be recalled that operationally Bales derived his Index of Status Consensus by means of Kendall's W calculated on scores from the questions relating to Ideas and Guidance (Bales & Slater, 1955: 276 - 277; Slater, 1955: 612. See also pp 179 - 181 above). These questions Bales identified as the task questions, Ideas relating to "specifically task-oriented achievement" and Guidance relating to "regulation and management of the group process in the service of task-oriented achievement" (Bales, 1953: 471). Thus, high and low status consensus groups were operationally defined by

Bales on the basis of the task dimensions alone. It is difficult to see why he did this. Granted that consensus is important, it then makes little sense not to measure it in relation to the social scale (Liking) aswell as the task scales.

Part of the reason might be related to the exclusion of self ratings in the social questions, thus making it difficult to calculate Kendall's W. But this cannot be the whole of the case, because, although he doesn't discuss it, he was well aware of a paper by Taylor (1951) which outlined a modification to Kendall's W permitting the exclusion of self ratings, having cited it on several occasions (see, for example, Bales & Slater, 1955: 276; Heinicke & Bales, 1953: 38). The reason would therefore seem to lie elsewhere. In fact this issue points to another area of equivocation on Bales' part; his subordination of the social function to the task function.

Despite contrary appearances, one detects throughout Bales' discussions an unwarrantable, if slight, emphasis on the task activities of the group thus vitiating discussion and understanding of the social aspects. It is as if for Bales, as for most other writers, the only issue of interest is whether the group eventually fulfills its task. And yet such an emphasis in Bales is inappropriate in view of his arguments about equilibrium, the force of which would suggest that social activities, and those who perform them, are as important as task activities, if not more so in some circumstances:

> "... it should be noted that the nature of the task (which lacks a clear criterion of successful solution other than group agreement) and the fact that

> the groups are initially leaderless tends to make it very important whether or not the members of the group can work out a satisfactory set of social-emotional relationships to each other. ... the lack of status consensus may be one important underlying factor associated with the degree of social-emotional conflict on the overt level." (Heinicke & Bales, 1953: 21).

This passage suggests that the social function, and by implication the social role, is independently important of the task function. Nevertheless, in his explanations for role differentiation, as it will be recalled, Bales suggests that it is task activity which directly stimulates a need for social activity. That is to say, he suggests that social activity is contingent on prior task activities, thus rendering the social function subordinate.

The practical outcome of this bias is that, even granting that Bales' operationalisation of the social specialist is acceptable, he still cannot proceed with analyses in respect of the social specialist. Consensus, as measured by Kendall's W, is an indication of the amount of agreement between sets of rankings. It can therefore be crudely interpreted as a measure of the amount of agreement about who it is that is top, if anyone. The effect of excluding the social scales from such analysis, therefore, is that there is no indication of whether an individual apparently rated best Liked is, so to speak, the group's choice.

There are many ways in which an individual can emerge as top choice, some of them presenting fairly well known problems of interpretation (see for example Gillett, 1984a, b, 1985), and in the absence of some measure of agreement there must be substantial room to doubt that any overall measure indicating someone as top

has any validity as an indication of group level preference. That is to say, there remains the problem that the result might simply be a statistical artifact, with very little or no relation to actual psychological processes within the group (Prince, 1983. See also section 3.2., b, c, pp 227 - 229 above). Thus, those analyses offered by Bales and his colleagues in respect of social "specialists" must be regarded as doubtful simply because there is no indication that the group is in agreement that the person so identified, on the basis of mean ratings of Liking, is the social specialist, or indeed that there is one.

It is clear from this bias in measuring consensus, plus his weak operationalisation, that Bales' conception of the social specialist is nowhere near as closely specified or understood as that of the task specialist, and in some ways the emergence of a social specialist appears to be of less interest than that social functions should be performed, whether by an individual or by the group as a whole. That is, Bales somehow seems to be content to leave performance of the social function at an inferential level, rather than examine it too closely. Nevertheless, by failing to take measures of consensus with respect to Liking, his principal social scale, Bales in effect weakens his own arguments, explanations and analyses with respect to the emergence of social specialists, even if it is allowed that being best-Liked is a sufficient operational definition. In particular, as will be obvious, the analyses which require a clear identification of a person best-Liked, those relating to the percentage coincidence method, and the IPA analysis of Ideas person's and best-Liked group member's behavioural profiles, are very much weakened.

In further consideration, it is worth pointing out that low status consensus with respect to task activity does not necessarily imply low status consensus with respect to social activity, although the subordination of the social function in Bales analyses seems to imply that it does. But consider this; if a group fails to "get its act together", so to speak, with respect to its task, then there might be sufficient necessity for social activity to reduce frustrations generated by the failure to act at all. That is to say, low status consensus with respect to the task scales suggests the failure to develop a sufficiently acceptable task structure to enable the group to proceed with its task, but a social structure might nevertheless emerge. In other words, low consensus with respect to task scales can be perfectly consistent with high consensus with respect to the social scales.

In sum then, it has been argued here that while status consensus is an important aspect of the role differentiation hypothesis, Bales' application of the consensus measures to the task scales alone is unwarranted, and results in an undermining of his own subsequent analyses. In particular it has been suggested that because he does not assess the levels of consensus with respect to the social scales, his analyses in terms of percentage coincidence and behavioural analysis of "specialists" in terms of IPA are particularly vulnerable.

7. SUMMARY OF THE CHAPTER.

This chapter presented a critique of Bales' method and measurement procedures. There were three foci to the chapter. The first relating to implications for the interpretation, acceptance or rejection of Bales' own work. The second relating to the evaluation of subsequent role differentiation research, both in terms of the criteria by which it might be judged as presenting "fair tests", and also by which it too might be accepted or rejected as having tested the role differentiation hypothesis. The third focus related to the empirical work conducted within the present study.

In terms of limitations in the scope of the role differentiation hypothesis which Bales identified, there were, in terms of method and measurement, only four. **First**, the nature of the kind of group which Bales studied, being the "traditional" small face to face discussion group. **Second**, the subjects which Bales employed were unacquainted at the beginning of the study, and this was argued to be an important initial condition. **Third**, the nature of the task, which in Bales case was an open-ended discussion task with no obvious solution to it. **Finally**, and perhaps the most important, was status consensus, which is considered by Bales to be an important limiting factor. To these should be added the limitation adduced from results relating to overtalking (see pp 186 - 188 above).

Only the last two have a direct bearing on measurement procedures, and of these Bales only placed emphasis on status consensus. The rest all relate to attributes of the population of study. Therefore, in some ways it is only status consensus which represents a genuine limitation on the scope of the role differentiation hypothesis, since the rest can legitimately be the object of extension studies.

In terms of the measurement procedures employed by Bales there appear to be no limitations apart from the requirement for some measure of consensus. By employing mixed measures of rankings and ratings, both with and without self ratings, Bales seems to be assuming that it makes little difference which is used. Therefore fair tests can use whichever kind of measure is preferred, although as it was argued ratings seem to be the better option. In wider terms, however, it was suggested, with illustrations, that the use of rankings or ratings, and the inclusion or exclusion of self ratings, do make a difference, and that quite dramatic effects on results can be observed depending on which choice is made.

It was argued that Bales' use of mixed measures raised questions of commensurability. Furthermore, related to this question of mixed measures, there was some doubt, about whether Bales' results, because based on the use of simple means, actually represented accurately the emergent structures of the groups he was studying. In particular it was pointed out that because he used mean rankings he was unable to distinguish between groups with a very differentiated emergent structure and those where little consistent differentiation is found. It was also argued that his measurement procedures almost inevitably guarantee that the only structure that Bales could observe with respect to any one sociometric scale is the simple hierarchy.

The operational definitions offered by Bales were criticised for being too vague, and for confusing two different senses of the term "specialist", which were referred to here as the intrapersonal specialist, and the group specialist. It was argued that the

two senses are entirely distinct, although Bales tends to confuse them, and in the process creates difficulty around which sense of the term he takes to be the one most appropriate to the role differentiation hypothesis. It was further argued, however, that it was the sense called here the group specialist which he had principally in mind, because of his analysis in terms of functional contributions to the group.

Finally, Bales measurement of status consensus, although status consensus itself was acknowledged to an important aspect of the role differentiation hypothesis, was criticised because it was conducted in relation to the task scales only. It was suggested that this indicated an unwarrantable emphasis on task aspects, and in effect made the social function subordinate to the task function. Furthermore, it was argued, by emphasising the task aspects to the detriment of the social, Bales' analyses and discussions revolving around social specialists were weakened considerably.

It was argued throughout that because of the weaknesses and problems with Bales methods and measurement procedures, the whole basis of his empirical results was brought into question. This is addressed in the next chapter.

CHAPTER 7: CRITIQUE OF BALES' RESULTS.

1. INTRODUCTION.

Embarking on a detailed examination of the data that Bales claimed to demonstrate role differentiation is like walking into a minefield. There are conceptual, theoretical and statistical difficulties everywhere, often of bewildering complexity. What at first seems clear and concrete becomes as elusive as a ball of mercury upon closer examination. It has to be said that the data, the "evidence", presented by Bales and Slater is so messy, and the analyses and interpretations so bizarre in places, that it is frequently not at all clear what is being examined, why it is being examined, and what the supposed significance of the results is. There is no obvious link between the data, and the theory which allegedly grew from it.

At this point it will be useful to distinguish clearly the two senses of role differentiation which are pertinent to this chapter. First, the conceptual version of role differentiation, which has been discussed at length earlier in the thesis (chapter 2, and parts of chapter 4). This is expressed in terms of functional contributions to the group by one or more group members. It is as part of the conceptual formulation that the concepts of task and social or socio-emotional specialists are employed, with the

suggestion that the one makes the most significant contributions towards accomplishment of the group task (the task specialist), and the other makes the most significant contribution towards group maintenance (the social specialist). The second, empirical sense, however, is articulated in terms of persons rated as top on the sociometric scales Ideas, Guidance, Liking, and sometimes Disliking, and the behavioural measures Talking and Receiving. In discussing this sense in which the term role differentiation is used, the term "specialist" comes to mean simply someone rated top on a specified scale, and for present purposes this use of the term will be referred to by the construction "sociometric" specialist.

There are obvious difficulties of correspondence between the conceptual and empirical versions of the role differentiation hypothesis, for example the rather shaky relationship between the conceptual construction "social specialist" and the empirical construction of being "best-Liked" which was noted previously (see also Burke, 1967, 1969, 1972; Olmsted, 1959; Theodorson, 1957; Wheeler, 1957). Nevertheless, the primary purpose of this chapter is to examine the results presented by Bales and Slater for evidence of role differentiation in the empirical sense. Only secondarily will the evidence be examined in relation to the conceptual sense. Part of the critique of these empirical results has already been presented in the last two chapters. This chapter will complete it.

It is not proposed here to re-examine every aspect of the results as Bales and Slater presented them, but to examine systematically only the main ones. These, broadly speaking, are the data falling

into the global categories of data identified earlier as "correlational evidence", "percentage coincidence evidence" and "behavioural evidence". It will be demonstrated that at these global levels the data are fundamentally flawed to the extent that the further analyses offered by Bales and Slater of developments over time and the attribution of leader status, by extension, can also legitimately be regarded as flawed. In any event, it is apparent from the lack of detailed discussion presented by Bales and Slater in respect of these further analyses, that they are legitimately regarded as of less importance than the larger categories of data (see chapter 5 above).

As indicated in the last chapter there are identifiable difficulties associated with Bales' methods and measurement procedures which tend to undermine the whole data base. Furthermore, as noted previously, there are inconsistencies in the analyses and interpretations offered by Bales and Slater, based on selective interpretation, confounding of levels of analysis, and frequent use of what Huff (1973) calls "semi-attached figures", that is sets of numbers which seem to be demonstrating one thing, but are in fact measuring something quite different, albeit with a similar sounding name.

These problems have important and far reaching implications for what is or is not acceptable as a test of the role differentiation hypothesis, particularly for the evaluation of replication studies of Bales' work, and of any research aimed at testing the hypothesis whether in Bales' terms or any other. Taken together the inescapable conclusion is that nowhere does Bales, or anyone who

imitates his methods and procedures exactly, present any evidence of role differentiation in the empirical sense. Bales' analytical procedures in respect of his data are such that they obscure what ought to be the most basic unit of analysis, the group, thus preventing any serious empirical consideration of role differentiation as it might or might not occur in particular groups.

2. BASIC EVIDENCE.

Here we examine the most basic results presented by Bales, those expressed as the graph shown in figure 5.1. above (p 185. See also Bales, 1953: 473, 1958: 440). It was remarked earlier that this figure constituted not only the basis for the role differentiation hypothesis, but also, in effect, most of the evidence in favour of it as well. Certainly of all the evidence presented by Bales it is by far the clearest and most striking.

Figure 5.1 demonstrates one of the most irritating features of Bales' treatment of results; his penchant for obscure data transformations which Wheeler (1957) criticised:

> "Each entry at a given activity rank is a mean over 12 sessions for the persons who occupied that rank as of each meeting. (Four separate five-man groups were involved.) The idea index is not actually a rating but an index obtained by adding rankings received (including self rankings) and subtracting the total from the highest possible, 25. The like and dislike indexes are average ratings received, with the highest possible, 28." (Bales, 1958: 440).

No rationale is given for the method of transforming rankings into ratings that Bales describes. Furthermore, without systematic investigation the effects of this particular transformation on the structure of the data are unpredictable. Thus, even at the most

basic level, there is reason to be concerned about the evidence that Bales presents, and that is without taking into account the kinds of problems identified in the last chapter.

The aggregate levels at which Bales presented and tested his data is well illustrated here. The data upon which figure 5.1 is based were assembled from 12 "assorted" meetings of four 5-person groups:

> "No distinction was made as to which meetings in the series of four were represented. The identity of men was not preserved from meeting to meeting. We simply took each meeting, listed the men in rank order of total amounts of participation given out, and recorded the "number of votes received" on each role. The data for all rank one men on total acts initiated were pooled , and so for all rank two men, and so on for the five. The fact that Joe Smith might have been rank one man in the first meeting, rank two man in the second, and so on, was ignored." (Bales, 1953 a: 472).

Thus, the role differentiation hypothesis, in the empirical terms laid down by Bales in respect of figure 5.1., is not couched in terms of <u>specific</u> empirical instances. The same observation can be made in relation to all of the results derived from the correlational method. This underlines the important point, noted previously, that the emphasis of Bales' work was on the identification of the principal dimensions underlying social interaction, which culminated in SYMLOG (Bales, 1953 a, 1958, 1970, 1981, 1983; Bales et al., 1979 - see chapter 2, p 81 et seq., and chapter 5 p 178 - 179).

It should be stressed that this aggregation of data, and subsequent analysis of overall general trends and clustering, is not being criticised as an exercise in its own right. Taken in rela-

tion to Bales' later interests it is a perfectly reasonable approach. Nevertheless the question can be raised, as indeed Bales and Slater themselves point out, whether inferences can legitimately be made <u>with respect to specialisation by particular persons within particular groups</u> on the basis of such results (Bales & Slater, 1955: 288; Lewis, 1972, 1973).

As noted previously, Bales summarises the results given in figure 5.1 in phrases which imply specific instances. For example he says "the person best-Liked tended, on average, to be the second most active group member" (Bales, 1953 a: 474). The interpretation typically put on this is something like the following:

a) Person A is top on Ideas and Guidance at times T1, T2, T3 ... Tn, and is not best-Liked.

b) Person B is best-Liked at time T1, T2, T3 ... Tn, and is not top on Ideas and Guidance.

c) Person A is not person B.

In other words, the impression given by Bales is that on most occasions, in most groups, there is a person rated top on Ideas and Guidance who is not the same person as the one rated best-Liked (Burke, 1973). There is also an attendant implication of persistence through time (Wheeler, 1957). On the basis of Bales' own words quoted earlier, however, these data cannot be interpreted in this way.

Bales uses the terms "in general" and "on average" as a sort of escape clause, which allows him to make specific sounding interpretations of his data, while avoiding criticisms relating to the frequency of role differentiation (see for example Bales, 1953 a, 1958; Bales & Slater, 1957; Wheeler, 1957). Part of the problem

relates to the interpretation of the term "on average", or synonyms of it, which is a notoriously tricky concept, particularly when used to make statements about the world (Huff, 1973; Moore, 1980). Bales has employed **aggregated numerical means**, but in his interpretations has implied **average frequencies**.

Strictly speaking all that figure 5.1 shows is that, in some general sense, Liking and not-Liking vary systematically together, as do Ideas and Guidance. Furthermore, ratings on Ideas and Guidance are related again in some general sense to relative levels of activity within a group. This, of course, is a restatement of one of the conclusions that Bales himself drew (Bales, 1953, 1958; Bales & Slater, 1955; Slater, 1955). This, however, does not constitute evidence that in any one of the groups studied was there a situation where one person was rated top on Ideas and Guidance, and a different person was rated best-Liked. In other words, **there is no evidence in these results of role differentiation in the empirical sense**.

3. THE HYPOTHESIS OF OVERTALKING.

The proposition that overtalking might be a moderater to role differentiation is an important one. Indeed, as noted in the last chapter, if it is correct then it serves as a clear limitation on the scope of the role differentiation hypothesis. Furthermore, it has obvious conceptual correspondence with the idea of legitimacy of task activity (Burke, 1972). Oddly, however, once having identified what he took to be evidence of a link between role differentiation and overtalking (that is, a low feedback ratio - see pp

186 - 187 above) Bales then completely ignored it. It does not appear in any of the later analyses. Why is not clear. The evidence which allegedly links role differentiation and overtalking (feedback ratios) is reproduced in figure 5.2 above (p 187).

The conclusion that Bales drew from his analysis was that where the person most active in the group received "proportionately less than he" or she initiated, (low feedback ratio), then that person's ratings on Ideas and Liking are depressed, and it is the second or third most active members who get the higher ratings (Guidance was excluded from the analysis). In situations where the most active member exhibits medium or high feedback ratios, however, then there is a linear relationship between Activity, Ideas and Liking (Bales, 1956, 1958). He claimed, therefore, that the pattern of results given in table 5.1 is principally due to effects attributable to levels of feedback, and in particular

> "The falling-off of liking received among the individuals who talk the most in total population is attributable especially to the ... extreme third of the population, who talk proportionately most above the amount they receive." (Bales, 1958: 446. Also Bales, 1956: 160).

The operationalisation of "overtalking" by the behavioural measure in the absence of perceptual and evaluative scores has already been criticised (chapter 5, section 5 above). Leaving this criticism to one side, the question remains of what one might expect in an analysis of overtalking and role differentiation (in the empirical sense). Taking Bales' conclusion and casting it in terms of specifiable groups, one would need data that allowed one to state conclusively that in those particular **groups** where the most active group members exhibit a low feedback ratio, then they do

not receive top ratings on Ideas or Liking. Conversely, in those groups where the most active group members exhibit a medium or high feedback ratio, that they receive highest ratings on Ideas and Liking.

Insofar as the data upon which this evidence is based are the same as those which were presented in figure 5.1., however, then this sort of inference cannot be made, for the reasons given in the last section. In addition, however, the data in figure 5.2. are further confounded because of the method that Bales used to assemble them. It will be recalled that he reassembled his subject sample first according to activity, and then according to feedback ratio (Bales, 1956: 158-9, 1958: 445 . See chapter 5, pp 186 -.188 above). In effect he broke up the groups from which the data were gathered. He then simply tabulated the ratings (loosely speaking), and took means. In other words, he took the ratings that each of his subjects (now assembled by activity rank and feedback ratio) received, and calculated means from them. One might, however, seriously question the legitimacy of this method.

By breaking up the scores the data no longer relate in any obvious way to the groups from which they were gathered. The ratings which he has tabulated were **specific to the group context within which they were gathered**, and therefore have little or no meaning outside that context. To explain, a person ranked 2 in group A, is ranked second only in relation to the other members of his or her group, and in relation, so it might be assumed, to the processes of interaction that took place within that group. Similarly, a person from group B who is ranked 2, is ranked in relation to the

rest of the members of that group. Beyond both being ranked number 2 in their groups, however, these two people share no common basis by which they can be compared directly. Especially, one **cannot** validly calculate means on their respective received ratings on Ideas and Liking, because, divorced from the social context within which they were gathered, **they are not directly comparable**.

The evidence relating overtalking and role differentiation is, therefore, not very good, and for present purposes can be safely ignored. The **proposition** linking the two, however, is still important. Bales' evidence neither refutes nor corroborates it, but there are still good reasons for taking it seriously (See, for example, Burke, 1967, 1968, 1969, 1972).

4. CORRELATIONS BETWEEN ALL DIMENSIONS.

The complete correlation matrices given by both Bales and Slater (1955) and Slater (1955) constitute some of the most important evidence that is offered in support of the role differentiation hypothesis if only because both authors seem to place so much emphasis on them. The pattern of results reported in both papers is substantially the same, and therefore the evidence is, prima facie, fairly strong (see tables 5.1. and A.1.). It is as part of this evidence that the link is explicitly made with status consensus as a moderating variable; role differentiation being claimed to vary systematically with levels of consensus. Thus, this evidence **relies** on the assumption that Bales' measurement of status consensus by Kendall's W calculated on the task scales is acceptable, that is, has some level of construct validity, reliability and discrimination. This has already been criticised in the last

chapter, where it was argued that Bales' measure of status consensus was inadequate. Nevertheless, the correlational evidence has been taken seriously by other commentators, and must therefore be examined here.

In common with the evidence discussed earlier, the data from which the correlation matrices were derived were aggregated across groups and sessions. Unlike the results discussed above, however, the groups from which these results are derived also varied in size from 4 to 6 persons (see chapter 5, section 6 above). One feature of this evidence which is noteworthy, and which must be emphasised, is Bales' own reticence about it. He specifically points out that there are statistical difficulties associated with the derivation of the coefficients he gives, and in particular the probability levels associated with them. As noted previously he advises his readers to treat with caution both the results and the conclusions drawn from them (Bales & Slater, 1955: 285; Slater, 1955: 614. See also Bales, 1951). Thus, from the very outset there are <u>acknowledged</u> difficulties associated with this evidence. As this section proceeds it will be seen that the difficulties multiply.

From the manner in which he presented and discussed his results it is obvious that here Bales is, as noted earlier, mainly interested in identifying the fundamental dimensions of social interation. He presents a series of correlation coefficients, and examines them for general patterns of correspondence between all of his measurement scales, both behavioural and perceptual. The interpretations he offers are nearly all focussed on one major aspect of the data,

as he sees it, the tendency for Liking to separate out as an independent dimension. Thus the objections raised earlier about drawing inferences with respect to role differentiation (in the empirical sense) in relation to <u>particular</u> groups also apply here.

With this in mind, what legitimate inferences might be made with respect to the data if taken at face value? On the assumption that Bales and Slater have correctly identified the main features of the results, then a modified form of their general conclusion could be presented. Briefly this is that within groups with <u>high status consensus</u> (High SC groups) general structuring seems to occur along the lines of a bipartite separation between an Ideas-Guidance cluster and Liking, with activity rates appearing to associate most closely with Ideas and Guidance. Within groups which exhibit <u>low status consensus</u> (Low SC groups), however, there appears to be a tripartite structuring with respect to activity, Ideas-Guidance, and Liking (Bales & Slater, 1955; Slater, 1955). The important question here is whether the data, as presented, actually support this conclusion. In relation to this question there are practical aspects of the data, the way they were reported and interpreted, which are of some importance.

It will be recalled that, in order to test differences between the high SC and low SC groups, Bales and Slater tested the differences between specific correlation coefficients which appeared in the matrices (reproduced in table 5.1 above, and table A.1 below). Bales reports that, in his data, the correlations between Guidance and Liking in high and low SC groups are 0.53 & 0.18 respectively, and that these are are significantly different at the 0.05 level.

In Slater's data, where the corresponding values are 0.49 & 0.27 the difference is reported as not significant (see tables 5.1 & 5.2, pp 189 & 191 above, and table A.1, appendix A below). Although attention is drawn to this result (Slater, 1955: 614 - 615, footnote 4) there is no comment about it. This is curious. Guidance is identified as one of the task scales, and Liking as the social scale (Disliking having been excluded from the analysis), and the fact that in Slater's results the levels of correlation between them does not differ significantly in relation to levels of consensus, tends to undermine part of the overall conclusion given above.

A similar conclusion can be drawn when the results purporting to demonstrate that Liking is less well correlated than the other scales, particularly in low SC groups, are scrutinised. It will be recalled that to demonstrate this proposition comparisons were made between those coefficients involving Liking and the other coefficients <u>within</u> each correlation matrix for high and low SC groups (see chapter 5, section 6, pp 189 - 195 above). First, there are errors in the reporting of these results in the account given by Bales and Slater (1955: 287), described in appendix A below. More important, however, is that of the 24 comparisons made within each matrix, 15 of those for High SC groups are significant (not 14 as they report), and only 11 are significant for Low SC groups. This result is <u>obviously</u> a consequence of the generally lower correlations within Low SC groups. Nevertheless, insofar as one could argue from these results at all then the conclusion should be that Liking is <u>better</u> correlated with the other scales in the low SC groups than it is in the High SC groups. That is to

say, the conclusion is precisely the contradictory of the one that Bales and Slater draw from these figures, which is that Liking is <u>less</u> well correlated with the other scales in low SC groups (see appendix A).

Further difficulties for their conclusion emerge when the figures detailing the pattern of differences between low and high SC groups are examined in relation to Talking and Liking, and Liking and Ideas. These correlations are significantly smaller than all of the other coefficients in the High SC groups, but not in the Low SC groups (see table A.2). This suggests that Liking and Talking, and Liking and Ideas are <u>better</u> related in low SC groups than they are in high SC groups, again a conclusion which contradicts the one drawn by Bales and Slater.

Finally, what of Slater's sorting of the correlation matrix? It was noted earlier that there was no rationale given for the grouping of the correlations that Slater adopted (see pp 193 - 194 above, and table A.3 below). When his sets are examined further, however, it appears that set 1 (T-R, I-G) comprises those areas of comparison where the Liking coefficients give consistently lower results, particularly for the low SC groups (see table A.2). This raises the suspicion that the claimed lower levels of correspondence with Liking for low SC groups is in fact a statistical artifact.

These "alternative" conclusions should not be pushed too far, however. The object of the exercise was <u>not</u> to demonstrate that Bales and Slater's conclusions were incorrect, but to demonstrate

that there is a serious problem of interpretation of the data. Much of what has just been suggested can be traced back to the problems of reliability in the statistics which have been mentioned previously, and to which Bales himself drew attention. Nevertheless, taken together, the conclusions given above, together with the arguments about measurement procedures given in the last chapter, suggest that there are sufficient difficulties and inconsistencies in the correlational data of Bales and Slater to question the overall conclusion that they draw, which is that structuring within groups occurs systematically with status consensus. Add to this the absence of consensus measures for Liking, and there is more than sufficient reason for wanting to dismiss, or at least treat with the greatest suspicion, this particular body of evidence and the conclusions that Bales and Slater draw from it.

Nevertheless, as in the case of overtalking, the proposition that status consensus is important in relation to role differentiation, is itself important, and must be taken seriously. Theoretically, at least, there are grounds for wanting to take it into account, if for no other reason than to exclude those collections of people that do not count as a group for the reason that they do not share a sense of social order - at least in relation to the contributions of group members (see chapters 3 & 4). This point will be expanded later in the thesis.

5. SUMMARY CRITIQUE OF THE CORRELATIONAL DATA.

It has been suggested that even the most basic evidence presented

by Bales and Slater in support of the role differentiation hypothesis is sufficiently flawed that at best it must be treated with extreme caution. Examination of the results suggests that Bales and Slater were measuring correspondences between Activity, Ideas, Guidance, Liking, and in some instances Disliking, **but in such a way that it could not be claimed that in any single instance was a group observed in which there was one person rated top on Ideas and Guidance, and a different person rated as best-Liked.**

Because of the methods used for aggregating data across groups, which relies on numerical means rather than average frequencies, there is a serious question as to whether the inferences they drew, which were couched in terms of specifiable individuals within groups, are warrantable, although to be fair it has to be acknowledged that they drew attention to this problem themselves. When these criticisms are combined with those made in the last chapter, relating to problems with measurement procedures, then the whole basis for taking the correlational data seriously, as evidence of role differentiation within groups, is removed.

We turn now to examine the percentage coincidence data, beginning with those relating to isolated prominence.

6. ISOLATED PROMINENCE.

The percentage coincidence method addresses itself to the percentage of cases in which persons occupying rank 1 on a specified scale simultaneously holds rank 1 on one or more other specified scales. As such the method goes some way towards answering the criticisms of the correlational method about aggregation across

groups without regard to within group features. Nevertheless, the way in which the data are presented and analysed, using the "group session" as the basic unit of analysis, still makes it difficult to identify specific instances of groups in which there is one person rated top on Ideas and Guidance and a different person rated best-Liked, and renders any estimate of the frequency with which it might occur impossible.

The basic evidence drawn from percentage coincidence is that which Slater refers to as isolated prominence (see p 195 above). The simpler version of the evidence (Slater, 1955: 613), which is reproduced as table 5.4. (p 196 above), apparently shows that of the five scales which Bales and Slater consider, more cases occur in which persons are ranked top on Liking and only Liking than occur for any other scale. Slater takes this to be indicative of the "relatively specialised" nature of Liking, showing in his view, the separation of Liking as a factor independent of Ideas, Guidance and activity rate. Thus, the emphasis on identifying the fundamental dimensions of social interaction, observed in relation to the correlational data, is preserved in these analyses as well. That is, the emphasis of Bales and Slater's approach is still on the search for clusters of scales and patterns of covariance across groups, rather than on the identification of role specialists within groups. Furthermore, although the isolated prominence results are very striking, there is reason to suppose that the very large total given for Liking may be an artifact.

The isolated prominence figures are presented, as indeed are all of the percentage coincidence data, in relation to numbers of

"group sessions". For example, the results reproduced in table 5.4 illustrate, according to the caption, the "number of sessions out of a possible 80 in which a given person holds top position in one and only one rank order out of five possible rank orders" (see p 196 above, also Slater, 1955: 613). Interpreting this in relation to the role differentiation hypothesis, in the empirical sense, is not, however, straightforward.

First, because the basic unit of analysis is the **group session**, rather than the group, there is no basis for relating them back to groups. For example, where a person is rated top on Ideas, we cannot tell if, in the same group during the same session, another person was rated top on Guidance and Liking simultaneously, or if two other people were rated top on Guidance and Liking separately. Furthermore, there is no indication of who was most active, except to the extent that, because the figures are of isolated prominence, in the example just given it could not have been the person rated top on Ideas.

Second, because the basic unit of analysis was the group session, we cannot tell if the persons rated as top on Ideas, Guidance or Liking were the same as those rated top in subsequent sessions.

Third, because the basic unit of analysis was the group session, we have no data about the comparative frequency of role differentiation and role integration. That is, we cannot tell if, in Bales' groups as a whole, there was more role differentiation, in the empirical sense, than there was role integration.

The situation is, however, slightly different with respect to the results of isolated prominence for Liking. If an individual can be identified who is rated top on Liking and only Liking, then it follows that someone else must have been rated as top on the task scales Ideas and Guidance. This, of course, is virtually the empirical definition of role differentiation. As evidence, however, it is oblique and incomplete. Again, because the basic unit of analysis is the group session, this information can give no clue as to the frequency with which this state of affairs occurred in relation to particular groups. Furthermore, no inference can be made about whether one other person was rated top on both Ideas and Guidance, or whether it was two people separately top on Ideas and Guidance. Finally, although it can be concluded that the person best-Liked was not the most active, in situations where isolated prominence with respect to Liking was observed, no information can be derived with respect to who it was that was most active, whether it was the person rated top on Ideas, or Guidance, or indeed someone entirely different.

In sum, the isolated prominence figures cannot, for the most part, be translated into statements about role differentiation, in the empirical sense, within particular groups. Beyond this, there is the separate problem about whether the total given for Liking in table 5.4 is anything more than an artifact of the measurement procedure.

Of the five measures used to derive the isolated prominence results, two can be fairly classified as behavioural (Talking and Receiving); two as task scales (Ideas and Guidance); and only one

as social (Liking). Therefore, if the members of a group wished to evaluate one of their number as having been very active in, or having made a major contribution to, the task activity of the group, there are three possibilities open to them. If, however, they wished to evaluate someone positively in a social-emotional sense, they have only the one choice, and that is to rate them best-Liked. No finer-grained discrimination is available, apart from Disliking, which was not used in these results.

In practical terms it is impossible to predict what effect, if any, a second or third social scale might have had on the figures. For example, had there been another social scale, then it is reasonable to assume that there would have been examples where a person was identified as top on both this second scale and Liking, as in the case of Ideas and Guidance, thus reducing the observed isolated prominence total for Liking. The implication is that with only one social-emotional measure figures for Liking may have been inflated in comparison with those for Ideas and Guidance. The best way to explain this is by means of an example.

Consider a situation in which in 9 sessions group members had discriminated between those people they wished to evaluate top in regards to task activity and Liking. In other words 9 (assorted) sessions in which role differentiation had occurred in the empirical sense. Ignoring comparative activity levels for the moment, since we are dealing with isolated prominence, imagine that in three of these sessions the raters identified one person top on Ideas, and a different person best-Liked. In three others, the groups had rated one person top on Guidance, and another person

best-Liked. In the final three sessions, the groups rated one person top on both Ideas and Guidance, and someone else as best-Liked. Each of these is, by definition, an illustration of role differentiation in the empirical sense. It is instructive to consider what happens when the figures are tabulated:

Ideas: 3
Guidance: 3
Ideas & Guidance: 3
Liking: 9

It can be seen what effect there is due to the single presence of Liking as the sole scale through which group members might make social-emotional or affective judgements of each other.

Recalling that Bales defined task specialists operationally as being relatively active within the group, and as receiving high ratings on Ideas and Guidance, then, in order for the isolated prominence figures to have any bearing on role differentiation, in the empirical sense, the proper comparison for the results on Liking is not those for Ideas and Guidance taken separately, but Ideas and Guidance taken jointly. This implies at least that the totals given by Slater in respect of Ideas and Guidance should be added together. When this is done, the revised figures for isolated prominence, based on totals given in figure 5.4, and each expressed as a total number of sessions observed out of 80, are:

Ideas & Guidance: 23.6
Liking: 30.4

It might be asked, in passing, how it is that numerical totals, even allowing for ties, can ever be expressed with figures after the decimal point. It suggests that the figures are not totals at all, but some other measure which has not been explained. More

important, however, the figures above are far less impressive than those quoted by Slater (see p 196 above), and give an impression of a much less striking separation of Liking from the other scales.

Thus, although the isolated prominence results appear at first glance to be relatively striking, there are clear grounds for arguing, first, that they give at best oblique and incomplete evidence in relation to role differentiation (in the empirical sense), because they do not allow statements to be made about what was actually observed in Bales' groups in relation to the number of occasions when one person was rated top on Ideas and (or) Guidance, and a different person was rated as best-Liked in the same group. Second, it can be argued that the figures, taken as an indicator of the independence, or otherwise, of Liking, reflect little more than the use of one scale only to measure the social dimension. That is to say, the totals for Liking are artifactually inflated by the sole use of Liking to measure the social dimension, and the simultaneous treatment of the joint task scales as separate measures. To this extent the isolated prominence figures, especially for Liking, can legitimately be regarded as artifacts of the measurement and analytical procedures.

7. PROMINENCE ON TWO SCALES SIMULTANEOUSLY.

Turning now to the joint prominence figures, it will be recalled that Bales and Slater presented these data in much the same way as they presented the results of the correlational method with respect to all scales (Bales & Slater, 1955: 289; Slater, 1955: 614.

See also tables 5.5 on p 197 and A.4 in appendix A). Again their analysis is very clearly aimed at identifying scale clustering, as noted earlier. Nevertheless, they conclude that:

> "In the High [SC] groups, then, the man who receives the highest rating on the performance of task functions (Ideas and Guidance) tends to be the same person who Talks and Receives most. In the Low [SC] groups this congruence breaks down. More often there is a separate individual who fails to achieve highest task status. The task specialist in the Low groups is almost never best Liked - if anything the probability is below chance - while the more active participator achieves this position about one time out of three." (Bales & Slater, 1955: 290).

As with the results examined previously, the question to consider here is whether the results that Bales and Slater present in relation to joint prominence warrant this conclusion. It is worth noting in passing, however, that the phraseology of the conclusion refers to role differentiation in the empirical sense.

The same fundamental problems as were identified with the isolated prominence results also attend the analysis of prominence on two scales simultaneously. These are exacerbated in the present case by the faulty measurement of status consensus, and, of course, by the use of mixed measures (see the last chapter). Nevertheless, because this body of results is important in relation to claimed evidence in favour of the role differentiation hypothesis, a re-examination of the data is important.

As in the isolated prominence results, the basic unit of analysis for the joint prominence data is the <u>group session</u>, and not the group itself. In the present case, however, the results are divided according to the level of status consensus of the groups from which they were derived, and are expressed as percentages of the

number of sessions in which joint prominence of a specified kind occurs. Quite what this means in relation to the raw data, however, is a mystery (Wheeler, 1957).

To expand, it is clear that the percentages are not based on the total number of sessions from which the data were gathered. For example, in those figures reproduced in table 5.5 above (from Bales & Slater, 1955: 289), the figures quoted for joint prominence on Talking and Receiving are 55.3% and 57.1% for high and low SC groups respectively. If these were percentages of the total given of 80 sessions for high SC and low SC groups taken together, then they would suggest that joint prominence in Talking and Receiving occurs in no less than 112.4% of cases. Obviously this cannot be what the figures refer to. Alternatively, and more likely, the percentages may be based on the proportion of the total of 80 sessions which high and low SC groups each contributed. For example, the figure of 57.1% quoted for low SC groups may be taken to indicate that in 57.1% of the sessions which can be accounted for by low SC groups, joint prominence was observed on Talking and Receiving. Without the knowing the <u>number</u> of groups to which this refers, however, the percentages cannot be converted into frequencies.

In other words, there is very little in the joint prominence figures which can be taken as evidence of role differentiation, and what there is is very poor. That is, there is little in these results to suggest that in any particular groups which Bales studied, there emerged one person who was rated top on Ideas and (or) Guidance, and a different person who was best-Liked. The

conclusion that Bales and Slater drew from these data, which was quoted at the beginning of the section, is utterly without warrant.

8. SUMMARY CRITIQUE OF THE PERCENTAGE COINCIDENCE DATA.

It has been argued that the percentage coincidence data do not stand up to scrutiny as evidence in relation to the role differentiation hypothesis principally because, in arranging it, Bales and Slater used as the basic unit of analysis the group session rather than the groups from which it was derived. In practical terms very few inferences can be made in relation to the patterns of status evolution in particular groups.

Some evidence indicating that role differentiation may have occurred in some of Bales' groups can, however, be derived from the isolated prominence figures in relation to Liking, and the joint prominence figures relating to Ideas and Guidance. Nevertheless the evidence is oblique and incomplete. In particular no estimate of relative frequencies can be derived from any of the results. Furthermore, in relation to the isolated prominence data particularly there are grounds for alleging that the use of Liking as the sole social scale tends to inflate the totals that are observed in relation to this scale, thus giving the impression of greater isolation than is actually warrantable. In any event, the very specific claim that Bales and Slater make which alleges that these figures give evidence of role differentiation are without any firm foundation, notwithstanding the weak evidence mentioned above.

The final job for this section is to consider whether or not there is evidence that requires a substantive explanation - even if not in terms of role differentiation.

All of the percentage coincidence data rely on the relatively unproblemmatic identification of who comes top on a scale. Unfortunately such identification <u>is</u> problematic. The use of simple means to summarise group level data, particularly in relation to emergent structure, has already been argued to be inadequate because different bases for the summaries can give radically different answers (see pp 227 - 229). That is, different bases for means (e.g. rankings or ratings) can produce different summary status orders (see for example, Burke, 1972; Prince, 1987; MacRae, 1988; Reidesel, 1974). The problems of identifying social choice are well known and long-standing (Gillett, 1984; 1985); it is <u>never</u> a straightforward matter to identify who is a group's choice, but the use of simple means is certainly not one of the most valid or reliable methods.

The percentage coincidence data, therefore, rests on the faulty premise that Bales' measurement techniques are capable of identifying who comes top on any particular scale. There are thus sufficient legitimate grounds for concluding that the whole of the percentage coincidence data base collapses in the light of these criticisms. That is to say, not only do the isolated prominence results, and the joint prominence results, collapse, but also, because they are based on the same kind of data and analyses, the later examination of trends over time and the results relating to the attribution of leader status must collapse also.

9. BEHAVIOURAL DIFFERENCES BETWEEN "SPECIALISTS".

The final area of evidence to be discussed is the behavioural analysis of the "specialists" which Bales and Slater claim to have found (the "sociometric specialists" being defined as persons who came top on Ideas, or who came top on Liking. See table 5.10, p 205 above, and table A.7, appendix A below). This of course relies on the straightforward identification of who came top in the first place, in precisely the same way as did the percentage coincidence data. Thus, from the outset there is one major weakness to the results. There are others.

It is clear that the results reproduced in table 5.10 represent intrapersonal specialisation, that is an individual who is, or is seen to be, most active in certain behavioural categories, and less so in others. We have until now been referring to interpersonal specialists, where the referrent is external to the individual, that is, judgements of "more" or "less" active are made relative to the contributions of all other group members.

Thus the IPA analysis of "specialists" which Bales offers can have no definitive bearing on questions relating to role differentiation when this is understood in the conceptual sense as the emergence of separate task and social specialists who make significant functional contributions towards solving the group task, and maintaining group integrity. Nevertheless, notwithstanding the difficulty of identifying who is best-Liked, and who is rated top on Ideas, if the evidence does show that the persons that Bales' identified as top demonstrate a marked bias in terms of qualitative acts (as defined by IPA), then it is certainly an important result. In particular, if the person identified as best-Liked showed a marked bias in favour of the social categories, it would, as argued previously, force us to take seriously Bales' claims that being best-Liked is related to social activity, even if it were not conclusive. So, a close examination of the results here, and the conclusions drawn from them, is important.

According to their interpretation, the most basic result, what they call the "most salient general feature", is that the Ideas person seems to initiate interaction most heavily in the task area, and the best-Liked person in the social area. This is the fundamental claim which follows through, and to some extent determines, subsequent analysis. But, like so much else about the role differentiation data base, it is flawed and misleading. It is certainly overstated.

The impression that one gets from this claim is that, in some way, the best-Liked person initiates substantially more in the social area than the Ideas person, and conversely that the Ideas person initiates substantially more than the best-Liked person in the task areas. This is, however, ambiguous; it could mean, for example, that the best-Liked person contributes more in the social area than in the task area, thus referring to intrapersonal specialisation. On the other hand, it could mean that when compared directly the best-Liked person contributes more in the social area than does the Ideas person, thus referring to interpersonal specialisation. In neither case, however, do the data support the claim.

The data are shown as percentages of each "specialist's" time which is spent in the different qualitative categories. That is to say, there are no raw frequencies published which allow a direct comparison of the "specialists" in terms of the gross amount of input each makes in the different categories. Therefore the data, at best, can only show comparative amounts of time that each spends, individually, in the different areas. When the results are viewed with this in mind then there is little basis for the claim described above. The best way to show this is to express the figures given in table 5.10 in terms of totals within each of the four main IPA categories. This is shown in table 7.1 below.

Table 7.1. Composite profiles in percentages of 44 persons ranked top on Ideas and 44 persons rated best-Liked for the same sessions.

Totals by IPA main category.

	Initiated		Received	
Interaction Category	I	L	I	L
Area A: Positive Social	23.25	28.22	33.81	30.62
Area B: Task Attempts	60.25	53.41	46.59	52.85
Area C: Questions	5.81	7.98	6.41	5.38
Area D: Negative Social	10.69	10.39	13.19	11.15
TOTALS	100	100	100	100

Adapted from Slater (1955: 618). See table 5.10 above, p 205
See also Bales & Slater (1955: 279), table 6, which is reproduced in appendix A, as table A.7.

Even if one were to be generous, the totals in table 7.1. could hardly be claimed to show dramatic differences which warrant the description "heavy initiation". What they show is a slight trend in which the Ideas person seems to spend a marginally greater amount of his or her time active in task area (B) than the best-

Liked person, and the best-Liked person spends marginally more in social area (A). But the difference in proportions in both cases is very small, and doesn't really say anything. Because the figures are relative to the activity rate intrapersonally, and not interpersonally, then the figures have no real comparative value. For example, the 23.25% activity that the Ideas person spends in positive social activity could represent double the social input represented by the 28.22% for the best-Liked person, but there is no basis to make any judgement on such matters.

When the totals are compared intrapersonally, there still is no basis for the claim of substantial specialisation. Both the Ideas person and the best-Liked person spend most of their time engaged in task area B, task attempts (60.25% and 53.41% respectively). In both cases positive social activity accounts for something around a quarter to a third of total input (23.25% and 28.22%). Thus, in respect of these data Bales and Slater tend to overlook important aspects which undermine the overall conclusion, while exaggerating those features which support it. This criticism is further strengthened by Slater's rather off-hand dismissal of the IPA data in respect of categories 10 to 12 (area D: negative social activity) because it didn't seem to fit a systematic pattern in line with the general conclusion (see p 208 above).

It is worth pointing out at this stage that despite Slater's claim to have found systematic differences between the best-Liked person and the Ideas person, in relation to their respective IPA profiles (see chapter 5, section 10 above) a reanalysis of the results that Slater gives (and also those given by Bales and Slater - see

appendix A) conducted category by category by means of a t-test, yielded no significant differences at all. Admittedly this is in some ways an unfair test, because Bales and Slater evidently conducted their analyses on results which they do not report (see pp 206 - 209). But in the absence of any other data it is the nearest one can get to testing the differences that they claim their data demonstrates.

Thus, this, the last set of results which Bales and Slater present as evidence in favour of the role differentiation hypothesis has been demonstrated to be deficient. This particular body of evidence is unacceptable principally because of problems associated with identifying who it is that comes top on any scale, which in turn is related to the problems associated with the use of mixed measures and simple means as summaries.

If these are overlooked, however, then nevertheless the data can be shown to be deficient on a number of other counts. They are based on a confusion between the two sense of the term "specialist", that is between the senses that were earlier called the "interpersonal specialist" and the "intrapersonal specialist". Furthermore, because of the nature of the data, percentages based on intrapersonal profiles, there is no basis whatsoever for comparisons between the so-called "specialists"; the Ideas person and the best-Liked person. Beyond this, the data give no evidence at all of significant differences between the "specialists", and what differences they might show are very marginal, and, as far as one can tell, non significant.

With this the entire corpus of results has been systematically shown to be inadequate in relation to the role differentiation hypothesis as it applies to particular groups.

10. CONCLUSIONS.

It has been demonstrated throughout this chapter that all of the supposed evidence that Bales and Slater present in favour of the role differentiation hypothesis is flawed. To put it crudely the wrong things were measured with flawed measurement procedures, and in some cases the flawed results were interpreted incorrectly.

Examination of the evidence demonstrates that results derived from the correlational method, and much of that from the percentage coincidence method as well, is presented principally in the interests of identifying the fundamental independent dimensions of interaction. In itself this has not been criticised; it is evident from Bales' later work that he was interested in wider issues than just role differentiation (Bales et al., 1979). But it does not address the role differentiation hypothesis as he described it empirically. That is, it does not address itself directly to the emergence of different people rated top on Ideas and Guidance, and those rated as best-Liked, within identifiable groups. In view of this, it follows that the data have nothing to contribute in relation to role differentiation as Bales conceptualised it in relation to the equilibrium hypothesis (see chapter 2). That is, it does not address questions relating to the emergence of separate task and social specialists who make different functional contributions to group activity and maintenance.

The percentage coincidence results, where not used to demonstrate the independence of the Liking dimension, evidently address the Likeability, or otherwise, of those rated top on Ideas and (or) Guidance. These results are better in a number of respects than those derived from the correlational method, but they are nevertheless flawed. The principle objections rest on the use of the group session as the basic unit of analysis, which has the unfortunate effect of obscuring what happens in particular groups. For this reason it was argued that the percentage coincidence results did not give evidence of role differentiation in the empirical sense, except for some oblique and incomplete indicators. These, however, were dismissed on the basis of arguments given in the last chapter about problems with Bales' measurement procedures.

The behavioural analysis of the so-called specialists, as identified by Bales and Slater, says very little, and can in fact be shown to be selectively, and badly, interpreted. Thus, at best the evidence does not furnish evidence one way or the other in relation to the role differentiation hypothesis.

Besides those problems discussed above, the force of the arguments assembled in the last chapter suggest that the whole of the body of evidence is based on faulty measures anyway. The correlational evidence requires that the simple summaries of group structure, in relation to each of the scales used, is a fair and accurate representation of what has emerged. But this is far from obviously the case. The percentage coincidence data, the time series data and the IPA analysis, rely on the assumption that the person who comes top on any particular scale can be identified with reasonable

assurance. Again this is far from being obviously the case, particularly in relation to the measures that Bales actually employed.

On these grounds it can be concluded that nowhere in the reported results is there sufficient evidence to warrant the hypothesis that role differentiation, in the empirical sense, occurs in any identifiable groups. A fortiori, therefore, there is no evidence of role differentiation in the conceptual sense either, that is in terms of the emergence of separate task and social specialists, as Bales conceptualised them in relation to the equilibrium hypothesis. The question that needs to be considered next is has anybody else?

CHAPTER 8: FURTHER STUDIES OF ROLE DIFFERENTIATION.

1. INTRODUCTION.

The work of Bales and his colleagues on role differentiation is frequently cited, but seldom tested. A recent on-line computer search of the Social Science Citation Index, for example, yielded over 4,000 references related to role differentiation alone. Of these however, only a handful were concerned with actually testing the role differentiation hypothesis, in any sense.

Of those empirical studies which claim to be, or have been taken to be, tests of the role differentiation hypothesis, only a very small number meet all the criteria of a fair test. A similarly small number of other studies, however, can be regarded as valid and useful extensions to the role differentiation hypothesis, introducing important conceptual considerations which might further limit the scope of the role differentiation hypothesis.

It is the purpose of this chapter to review these studies. Each will be examined against the following questions:

1) Is it a fair test of the role differentiation hypothesis in the terms specified by Bales and his colleagues?

2) Does it show evidence of role differentiation in either the empirical sense or the conceptual sense?

3) If it does show evidence of role differentiation, under what circumstances did it occur?

4) Regardless of whether the study shows evidence of role differentiation, or indeed of whether it meets the criteria of a fair test, are there any important conceptual or theoretical points which need to be taken seriously?

It is as well to reiterate what is being looked for here. In these studies we will be looking for evidence that in one or more of the groups studied, a structure emerged in which the person rated top on task criteria (Ideas and Guidance, or some more sophisticated measures) is not the same person as the one rated best-Liked (or in relation to some more sophisticated measure of social-emotional contribution).

It will be argued that in no case does any study show unequivocal evidence of role differentiation, although some interesting modifications and extensions to both the role differentiation hypothesis and to method are noted.

2. REVIEW OF THE CRITERIA OF A FAIR TEST.

Although already discussed earlier, it will be useful to reiterate briefly what are here taken to be the criteria for fair tests of the role differentiation hypothesis; that is, those criteria which distinguish tests of the hypothesis in Bales' terms. These can be broadly separated into two groups; methodological and analytical criteria. Of the two groups it is the former that is most important since this limits the scope of fair tests in relation to the nature of the kinds of group examined, and the type of task which it faces.

2.1. LIMITS IN RELATION TO GROUPS AND GROUP MEMBERS.

Bales specifically limits the scope of his research into role differentiation to what are generally known as small face to face groups (Bales, 1950 a; see chapters 2 & 3). In practical terms this means groups of between 3 and 6 members, which meet together in circumstances allowing face to face interaction (Bales & Slater, 1955; see chapter 5).

The groups should be initially unstructured (Bales, 1953 a, 1956, 1958; see chapter 5). Amongst other things this means that, at the outset, the groups studied should not have an identifiable set of roles and positions, whether formal or otherwise. Related to this in important ways is the stipulation that the groups should therefore be composed, as far is practically possible, of strangers or near strangers, so as to contrive a situation as near as possible which contains few structuring factors from outside the group context (Bales & Slater, 1955; see chapters 5 & 6).

2.2. LIMITS IN RELATION TO THE GROUP TASK.

The task with which the group is faced should be principally verbal in nature, and should be of the sort that stimulates open-ended discussion (Bales, 1950 a). Taking Bales' descriptions of the "standard group task" (Bales, 1952) as implying further restrictions, it may be inferred that the task should have, in Shaw's terms, solution multiplicity (Shaw, 1973; Stein & Heller, 1979), with a low task structure (Fiedler, 1967). Finally, the nature of the task should be such that it requires interdependent co-ordinated activity to derive a solution (Burke, 1972; see chapter 6).

The two sets of limits described above will be taken as the minimum requirements of a fair test. These are, broadly speaking, the methodological limitations which will be applied rigorously to those studies which claim to test the role differentiation hypothesis in Bales' terms. Studies which fail to meet these criteria will be excluded from further consideration in relation to evidence of role differentiation in Bales' terms.

2.3. LIMITS IN RELATION TO WHAT IS MEASURED.

Since role differentiation, as Bales consistently describes it, is concerned with the bifurcation of the general leadership role into task and social specialisms, some further criteria of fair tests need to be observed. A fair test must attempt, in some way, to examine the relationship between task behaviours and social behaviours, as perceived or enacted. At the very least this requires an examination in terms of the kinds of measures used by Bales, that is in terms of Ideas, Guidance and Liking. Studies which meet the methodological criteria described earlier, but which do not use these or very similar measures will not be considered as fair tests of role differentiation in Bales' terms, although some will be examined further as examples of extensions or modifications to the hypothesis, or to method.

2.4. ANALYTICAL LIMITATIONS.

Bales identified two limitations on the scope of the role differentiation hypothesis; overtalking (Bales, 1956, 1958) and status consensus (Heinicke & Bales, 1953; Bales, 1958; Bales & Slater, 1955; Slater, 1955). From the manner in which Bales drew attention

to them, both are obviously important. Nevertheless, since he evidently ignored overtalking in the majority of his analyses (see chapter 7), it would be unreasonable to require that fair tests of the role differentiation hypothesis, in Bales' terms, should observe it.

As to status consensus, the situation is rather more complex. Since Bales evidently placed much emphasis on it, and in the light of some of the arguments advanced independently within the thesis (see chapters 3, 4, 5, 6 & 7), status consensus is a fundamentally important aspect of role differentiation research. Nevertheless, Bales offers evidence that would seem to suggest that it is not as important as he first suggests (Bales & Slater, 1955; Slater 1955; see chapter 5, pp 195 - 203 above), and his analyses do not themselves consistently take it into account (see chapter 5, pp 198 - 203). Again, therefore, it would be unreasonable to insist that tests of the hypothesis should observe what Bales himself only occasionally observes. Nevertheless, we will take him at his word here, and include as fair tests only those studies which take status consensus into account. Those that do not, providing they meet the methodological criteria described earlier, will be treated as extensions or modifications of the role differentiation hypothesis, and assessed on their own terms.

3. REVIEW OF STUDIES OF ROLE DIFFERENTIATION.

The following is a list of published studies which their authors, or others, claim to be tests of the role differentiation hypothesis: Burke (1967, 1968, 1969, 1972); Etzioni (1965); Gustafson

(1973); Gustafson and Harrell (1970); Grusky (1957); Kipper et al (1981); Koomen (1988); Leik (1963); Levinger (1964); Marcus (1960); Rees and Segal (1984); Schroder (1964); Shelley (1960); Slater (1961); Smith (1963); Stang (1973); Strodtbeck and Mann (1956); Taguiri and Kogan (1960); Theodorson (1957); Turk (1961, a & b); Turk and Turk (1962); Wilson (1969); Zelditch (1955).

Of those listed, several can be dispensed with immediately. Leik (1963), Levinger (1964), Slater (1961) and Zelditch (1955) do not specifically test the role differentiation hypothesis at all. Instead they are more concerned with applying role differentiation theory to the family, and insofar as the family is a structured group, composed of non-strangers, then it fails to meet at least one of the criteria for fair tests described earlier.

Grusky (1957), applied the concept of "familial role differentiation" (i.e. role differentiation) in a study of a 15 member group comprising the staff of a psychological clinic. In this case the group was far larger than those used by Bales, but more important the relations amongst group members were already structured formally. In particular the director of the clinic was present as a member, and the group members were obviously very well acquainted with one another through working together.

Etzioni (1965) studied large organisations with formal structures, and was more interested in applying the role differentiation concept than in studying the emergence of role differentiation. Marcus (1960) and Schroder (1964) both studied "natural work groups" composed of working colleagues (i.e. non-strangers) whose

relations were partially structured in formal terms. For example, Marcus studied the emergence of "informal leaders" in relation to the "leadership style" of appointed supervisors. Similarly, Rees and Segal (1984) studied role differentiation in "natural" groups comprising of two American football teams. Team 1 consisted of 60 members, and team 2 of 42 (out of 101) members. Furthermore, the members of the teams were defined by formal positions, and were not strangers.

Strodtbeck and Mann (1956), although frequently cited in relation to role differentiation, do not really attempt to study the same phenomenon as that described by Bales. Their primary interest was in qualitative behavioural differences between men and women, and although they employed IPA to gather their data, the meaning of "role differentiation" in their work does not correspond with that of Bales. In particular they were not interested in identifying task and social specialists in the group sense discussed earlier (see chapters 2, 4, 5 & 7).

Kipper et al (1981) studied two groups of 30 members, who were engaged in a role play exercise. Furthermore, group members did not rate <u>one another</u>, but were asked to rate disembodied voices heard on a sound recording in terms of preference for future co-working and like-ability. This study therefore cannot be considered in terms of evidence in relation to the role differentiation hypothesis, as presented by Bales, since it bears no relation to group processes.

The same can be said of Stang (1973), who used a similar method to Kipper et al. He had three groups of 10 listen to prerecorded tapes of "group" discussions, and then rate the disembodied voices in terms of leadership within the "group", general leadership ability, and whether the rater thought that she would like the owner of the voice if they ever met. This is clearly not role differentiation research in Bales' terms. It is interesting to note in passing, however, that Stang's results suggest that leadership attribution is an increasing monotonic function of activity level, whereas Liking is an inverted U-shaped function, a result remarkably similar to Bales' finding discussed earlier, and presented as figure 5.1 (see chapters 5 and 7).

The study by Taguiri and Kogan (1960), although couched in terms relevant to the study of role differentiation in Bales' terms, is not aimed at observing or identifying emergent task and social specialists (however defined). It is, instead, focussed on individual preferences for task or social specialists. That is to say, they were interested in, broadly speaking, identifying the kinds of people who prefer task related behaviours in others, and those who prefer social-emotional type behaviours in others. Thus, they suggest that task and social specialists may fit the needs of different types of group members, but do not discuss, or try to identify, the part that these specialists play in terms of the group itself.

Shelley (1960) was not principally concerned with role differentiation at all. His main interest was in the relationship between levels of agreement about those who were rated number 1 on socio-

metric scales and group cohesiveness. His work contains several important and interesting comments on the use of correlations, and consensus measures based on complete rank orderings (i.e. Kendall's W) rather than on top rank alone, and these will be discussed where appropriate later on. Nevertheless, his study does not have direct relevance to questions relating to role differentiation in either the conceptual or empirical sense discussed earlier, because that was not the object of his study.

Finally, the studies by Turk (Turk, 1961 a, b; Turk & Turk, 1962) are frequently cited as important studies of the role differentiation hypothesis in a "natural setting" (Turk, 1961, a; Gustafson, 1966). When examined closely, however, then it becomes apparent that they meet none of the methodological criteria given above. The groups from which the data were gathered varied in size between 10 and 26, which is far higher than the limits set by Bales. Furthermore, the group members were not strangers, and were, to some extent, subject to formal status relations, being student nurses. Finally, although it is not entirely clear what the activities of Turk's groups were, it is nevertheless clear that they were not engaged in tasks which were principally verbal in nature. Thus, whatever Turk's results, they are not relevant to the role differentiation hypothesis as described empirically by Bales. Nevertheless, Turk's arguments in relation to legitimacy and task orientation, which are similar to those of Burke (1967, 1968, 1969, 1972), Gustafson and Harrell (1970) and Verba (1961), are important, and need to be taken seriously. They are discussed later.

None of the studies discussed above can be understood as furnishing evidence in relation to the role differentiation hypothesis as presented by Bales. In other words, whatever the results of these studies, they do not bear on the role differentiation hypothesis as it was examined by Bales, and as it is being examined within this thesis. It must be emphasised, of course, that in saying so it is not being suggested that the studies are poor, do not have worth, or are in some general sense irrelevant. Not at all. Nevertheless, since they do not study the same things, or in the same way, generally speaking, as Bales, then their results are not relevant to the purpose of this thesis.

Of the studies that remain in the list given at the beginning of the section, only one meets <u>all</u> of the criteria of a fair test described earlier, that is including overtalking (Smith, 1963). When the overtalking criterion is relaxed, however, then two further studies can be considered fair tests of Bales' role differentiation hypothesis, that is which meet both the methodological criteria and the analytical criterion related to status consensus: Gustafson (1973); Gustafson and Harrell (1970). Each of these three also constitutes an extension of the study of role differentiation, as will be explained later. The remaining studies (Burke, 1967, 1968, 1969, 1972; Koomen, 1988; Shelley, 1960; Theodorson, 1957; Wilson, 1969), fail to meet the criterion of status consensus, but all meet the methodological criteria, so they will be treated as extension studies.

4. REVIEW OF THE FAIR TESTS.

Smith (1963) set out to test four different theories related to

the role differentiation hypothesis, which posit the systematic emergence of role differentiation in relation to:

1) group cohesiveness (Theodorson, 1957)

2) status consensus (Heinicke & Bales, 1953)

3) feedback (Bales, 1958; Shelley, 1960)

4) personal values of group members (Turk, 1961, a, b; Turk & Turk, 1962).

The references given in parentheses are Smith's (see Smith, 1963: 335 - 338).

Smith structured his enquiry around a general postulate that:

> "... subjects who do not differentiate between their sociometric rankings are those who are highly attracted to their group." (Smith, 1963: 336).

In this sense his study extends the role differentiation hypothesis in relation to the concept "group cohesiveness", operationalised, following Van Bergen and Koekebakker (1959) and Theodorson (1957), through measures of individual members' "Attraction to the Group" (ATG).

In terms of role differentiation Smith's general postulate quoted above is revealing. He uses the term "differentiation" to refer not to the bifurcation of the leadership role into task and social specialisms, but to refer to the process by which individual group members distinguish between those they like, and those that they regard as making task contributions. In other words Smith was studying the circumstances under which group members will or will not like those they perceive as active in pursuit of the task. Crudely speaking, Smith was studying personality variables.

This view is reinforced by consideration of Smith's analytical procedures. For each group member he calculated correlation coefficients for each of his sociometric questions (Ideas, Leader status and Liking), and then divided them "into four types according to the magnitude of the correlations between the rankings made by each subject on (i) 'ideas' and 'leader' and (ii) 'leader' and 'liking'" (Smith, 1963: 338). These four types then form the basis for all of his analyses. Thus, as in the case of Bales' examination of the overtalking hypothesis, Smith's results are not group based, in that although the data were initially derived from a group context, they have been subsequently reassembled in such a way that the group has been lost altogether.

Thus Smith's results, whatever their merits and demerits in relation to individual propensity to differentiate between those who are rated as likeable or otherwise, cannot have any direct bearing on the role differentiation hypothesis as it is being examined within this thesis. In other words, Smith's results do not furnish evidence one way or the other in relation to the emergence of separate task and social specialists within groups. Nevertheless, the proposition that role differentiation might vary in relation to levels of ATG is worth taking seriously, and Smith makes some interesting comments about the use of Kendall's W as a measure of status consensus which will be discussed later in the thesis.

Like Smith, Gustafson (1973) examines role differentiation in relation to ATG, as well as in relation to status consensus and commitment. In point of fact, it is the last concept which structures his study. His principal hypothesis is that:

> "Small unstructured groups that are highly committed to the task will have less role differentiation than groups in which there is little commitment to the task. In highly committed groups the leader at the end of a number of sessions will tend to be ranked high on task activities and will be well liked. In less committed groups the leader will be ranked high on task activities but will be less well liked." (Gustafson, 1973: 668).

To test this hypothesis Gustafson studied 50 randomly assembled groups of undergraduates, the groups being composed of between 4 and 6 members. Each group met for 4 sessions of 30 minutes, during which they were asked to discuss a human relations or business policy case study, which was selected so as to be relevant to the course for which the group members were studying. Presumably (because Gustafson is not specific) at the end of each discussion session, each group member was asked to rank order all other group members on the basis of 7 sociometric criteria (Gustafson, 1973: 678) which can be paraphrased as follows:

1) For which member was the task most important?
2) Which member participated the most during the discussion?
3) Who contributed the best ideas?
4) Who did the most to guide the discussion?
5) Which member tended to laugh and joke the most?
6) Which member most definitiely stood out as leader?
7) Which member do you like best?

Of these seven Gustafson concentrated on Ideas and Liking, in order to follow Bales' procedures (Gustafson, 1973: 669, footnote 4). It is important to note, however, that Gustafson includes in his sociometric questions all (except Disliking) that Bales asked, plus a sociometric evaluation of activity and an extension question in relation to social-emotional activity (joking). In addition he also asked three further questions designed to measure ATG which will be discussed later.

The principal roles that Gustafson was concerned to measure were:

1) Leadership role: based on the sociometric question on who was the leader (question 6 above).
2) Task specialist: based on the question as to who contributed the best ideas (question 3 above).
3) Social-emotional specialist: based on the question who was best liked (question 7 above).

Role occupancy was defined in terms of the highest collective ranking (i.e. total rankings received):

> "The individual with the highest collective ranking was assigned the top rank and considered as the performer of that role." (Gustafson, 1973: 669).

Role differentiation was defined as a state of affairs in which different individuals "tended to be ranked No 1 on these sociometric questions" (Gustafson, 1973: 669), thus Gustafson's approach is completely consonant with that of Bales.

Gustafson's principal analytical technique consisted of the percentage coincidence method used by Bales (see chapter 5, section 7). Unfortunately he uses the same unit of analysis as Bales, the group session, and thus all the arguments presented earlier in relation to Bales' percentage coincidence data apply here. In particular, although Gustafson, almost alone among Bales' commentators, gives a very clear and precise definition of role differentiation in terms of specifiable groups, he then ignores it in favour of an analytical technique which makes it impossible to evaluate levels of role differentiation as it occurs, or fails to

occur, in specifiable groups. In other words, Gustafson's analysis in terms of percentage coincidence suffers from the same flaws as that of Bales, with the same consequences. That is, the results can have no direct bearing on propositions relating to role differentiation in particular groups, because the analysis isn't focussed on role differentiation in particular groups.

Gustafson's further analysis in terms of individual group members' propensity to rank other group members top on two scales simultaneously, analysed in relation to individual commitment to the task (Gustafson, 1973: 673, table 2), does nothing to clarify the situation. In fact it further clouds it by concentrating on individuals rather than groups. It is not clear, for example, how the data for the analysis were assembled, whether the same persons contributed to several cells in the contingency matrix, how many failed to appear in any cell, and so on. Furthermore, it is not clear how the data relate to the groups from which they were gathered. In other words this aspect of Gustafson's study fails to provide evidence in relation to role specialisation in groups for the same reasons as those given earlier in relation to Smith's study.

Thus, although Gustafson's study goes some way towards studying role differentiation in Bales' terms, because it contains the same basic flaws that Bales' studies contained, it therefore does not, that is can not, furnish evidence in support of the proposition that role differentiation ever occurs in any single specifiable group.

Gustafson and Harrell (1970) set out to study role differentiation amongst groups of MBA students, using task commitment as the overall structuring factor of their study. Their subjects were first year MBA students on an Organisational Behaviour course, 60 assembled from each of two years, 1966 and 1967. These subjects were assembled into 24 groups of 5 members each (12 groups for each year) which met for four sessions. It seems that the group members were given no choice about which group they joined, since Gustafson and Harrell use the term "assigned". It is not clear to what extent groups were composed of strangers, although since they were first year students it is reasonable to suppose that they were not well acquainted.

Sessions lasted for 30 minutes, during which the groups were asked to discuss case studies. For the 1966 groups these cases were assigned as part of the course, but because of changes in course emphasis during the following year, the 1967 groups had cases which were not always so obviously related. Thus, due to practical circumstances, Gustafson and Harrell had a fortuitous division between those groups for whom the task had a relevance beyond the confines of the laboratory and those that didn't. In other words, as they assumed, one set of groups for whom task commitment was likely to be high, and another for whom it was probably less high (Gustafson & Harrell, 1970: 300 & 311).

The 1966 groups were asked to complete a sociometric questionnaire at the end of the 1st and 4th sessions, and the 1967 groups were asked to complete the same questionnaire at the end of each session (Gustafson & Harrell, 1970: 300). The measures taken included

items 2, 3, 4, 6, and 7 from those listed above for Gustafson (1973), that is, Participation, Ideas, Guidance, Leader, Liking, plus an evaluation of the quality of the group decision, an evaluation of the effectiveness of the group, and a measure of enjoyment of participation (Gustafson & Harrell, 1970: 301). In addition behavioural data were gathered from the 1966 sessions using an adaptation of an Observation Coding Sheet from Carter (1955).

The data thus gathered were compared directly with the results published by Slater (1955 - discussed earlier in chapters 5 - 7), to the extent that Gustafson and Harrell's results were tabulated alongside those of Slater. This, of course, entailed that Gustafson and Harrell used the same analytical techniques as Slater, and those of Bales. Their data are analysed using isolated prominence and joint prominence tabulated by group session (Gusafson & Harrell, 1970: 302 - 303, tables 1 & 2), as well as through the correlational method derived from data pooled across groups and group sessions (Gustafson & Harrell, 1970: 304, tables 3 & 4). In point of fact, their analysis used all of the techniques employed by Bales and Slater, and thus their study is, in the strictest sense, an attempted replication. Indeed it is the only strict replication that the literature seems to contain.

Their results bear some resemblance to those of Bales and Slater, but there are also striking differences. For example:

> "Bales and Slater found that there tended to be three roles performed in low status consensus groups: the active participant, the task specialist, and the best-liked. Our results, Table 8, do not show such differentiation between the active participator and the task specialist by the fourth session - especially in the class of 1966." (Gustafson & Harrell, 1970: 307. Table 8, to which the quotation refers, is on the same page).

They try to explain this, and other differences, in terms of their basic postulate about task commitment (Gustafson & Harrell, 1970: 311), but in the end they are forced to the lame conclusion that the basic situation, particularly in relation to the factors which may affect role differentiation, is not well enough understood, and that further research is required. There is another explanation, however, which is more fundamental.

It was argued in chapters 6 and 7 above, that there are fundamental flaws in the measurement and analytical procedures adopted by Bales. Gustafson and Harrell are fully aware that such flaws exist, but they fail to do anything about it. For example, they draw attention to the problems engendered by using rank order correlations, reiterating a point made earlier by Shelley (1960) that variations at the bottom of a rank ordering can have as much effect on a derived coefficient as variations at the top of a rank ordering (Gustafson & Harrell, 1970: 303, footnote 3). They conclude, again reiterating Shelley (1960), that:

> "... more concern should be placed on the relationships between the top ranks on the various sociometric questions." (Gustafson & Harrell, 1970: 303, footnote 3).

This, however, they fail to do, and they repeat the same analytically dubious procedures of Bales and Slater without modification. In particular they, like Bales, aggregate data across different groups and sessions, and therefore cannot give any clear indications about role differentiation within particular identifiable groups. Furthermore, because they used the same basic

technique for deriving status orders in respect of their sociometric scales as did Bales, that is mean rankings, then there is the serious question about whether they have correctly identified who came top on their scales. In chapter 6 above it was argued that the assumption was unwarranted (see also Burke, 1972; Pollay, 1968; Reidesel, 1974). In other words, Gustafson and Harrell do not present evidence that role differentiation occurred within any of their groups.

The overall conclusion of this section is, then, wholly negative, in the sense that none of those studies included here as fair tests present any evidence of role differentiation. Again, it must be stressed that this means, in the present context, evidence that in at least one group a structure emerged such that there was one person identified (by some measure other than simple mean rankings or ratings) as top on a task criterion, and a different person rated top on a social-emotional criterion. We turn now to those studies classified earlier as extension studies.

5. REVIEW OF THE EXTENSION STUDIES.

Two themes dominate the extension studies of role differentiation: group cohesiveness (Gustafson, 1973; Koomen, 1988; Shelley, 1960; Smith, 1963; Theodorson, 1957) and task legitimacy or commitment (Burke, 1967, 1968, 1972; Gustafson, 1973; Gustafson & Harrell, 1970; Wilson, 1969). Before reviewing the evidence presented in these studies, therefore, it will be useful to review, briefly, the arguments advanced in relation to these concepts.

5.1. ARGUMENTS IN RELATION TO COHESIVENESS.

The argument in relation to group cohesiveness is a straightforward one. Taking the definition that a cohesive group is one where there is high identification with the group amongst group members, Theodorson (1957) reasons that the basis of cohesiveness, that is the basis for this attachment, is related to the degree to which the group satisfies the individual needs that members bring to the group context. In other words, the extent to which the group is rewarding for its group members, taken collectively, is the extent of its cohesiveness (Bass, 1960; Secord & Backman, 1974).

He further suggests that as, and because, the group provides these satisfactions, so it takes on a value such that members, considered collectively or individually, will be willing to abandon satisfaction of some of their personal needs in return for the satisfaction of other needs. An important part of this process, he argues is that there develops

> "... an increasing tendency to judge [other] members in terms of their contributions to the group." (Theodorson, 1957: 59).

And finally:

> "The greatest contributions to a group are made by the leaders, since attainment of a position of leadership depends on contributing to the group's welfare and progress." (Theodorson, 1957: 59).

Thus, in a cohesive group it follows, according to Theodorson, that the group members' needs, individually and collectively, are being satisfied, and the symbol, or focus, of these satisfactions is, or are, the group leaders. Therefore, in a cohesive group the leader or leaders are likely to be rewarded with positive affect

(Theodorson, 1957: 58 - 60. See also Smith, 1963: 335). Casting this in terms of the role differentiation hypothesis, Theodorson (1957: 60) proposes that:

1. The higher the cohesiveness of a group, the higher will be the correlation between popularity rank and rank based on the perceived amount of valuable contributions to the group.

2. The higher the cohesiveness of a group the higher will be the correlation between popularity rank and perceived leadership.

The use of "needs satisfaction" as a fundamental motive for group members, could be disputed, and substitution made of terms couched instead in the language of values and goals used elsewhere in the thesis, but this would be beside the point. The argument given by Theodorson is substantially that which others have adopted (where they have bothered to present an argument at all - see Shelley, 1960) straight from Theodorson's work (Gustafson, 1973; Koomen, 1988; Smith, 1963).

5.2. REVIEW OF THE EVIDENCE IN RELATION TO COHESIVENESS.

The studies mentioned above uniformly operationalise cohesiveness in terms of some measure of Attraction to the Group (ATG). Smith (1963) justifies this in the light of arguments presented by Eisman (1959), and Van Bergen and Nienhuis (1960) that the various aspects of cohesiveness do not relate to one another, and the assertion by Van Bergen and Koekebakker (1959) that:

> "... the only valid measure of cohesiveness is a measure of the resultant intention to leave or stay in a group, rather than any of the components of cohesiveness." (Smith, 1963: 336).

Thus cohesiveness is typically measured through such questions as:

> If you were to be given the opportunity to move to another group would you be pleased about it? (Smith, 1963: 339. See appendices E and G below).

It has been argued already that two of the studies which examine role differentiation in relation to ATG do not provide evidence of role differentiation in particular groups (Gustafson, 1973; Smith, 1963), so these will not be addressed again here.

Theodorson (1957), from whom the argument in relation to ATG was taken, studied four groups: two of them were laboratory groups, and two were "natural" groups, by which Theodorson means they were convened by someone other than himself or a colleague connected with the study (Theodorson, 1957: 61). The natural groups need not be considered here. In terms of size they are outside the parameters specified earlier (being between 9 and 14 members), and each one had at least one formal "leader" (Theodorson, 1957: 61).

The two laboratory groups consisted of 4 separated married couples, that is each group consisted of four people whose partners were assigned to the other group, the groups being composed of two men and two women each. It is not made clear if the members of the groups knew one another. The groups met 2 hours weekly for 8 weeks, ostensibly to "better the marital adjustment of each couple". Each group met in a different room for one hour to plan a fifteen minute "sociodrama dealing with a problem of family living". They then came together, presented their dramas and finally had a half hour session during which they criticised each other's dramas (Theodorson, 1957: 60).

A questionnaire was administered to all group members at the end

of each session, each member being asked to rate all the members of his or her group (including self-ratings) on a five point scale on the following questions:

1) Amount of leadership
2) Amount of valuable contributions (good ideas)
3) How much did each member enjoy the meeting?
4) How much is each member concerned about and willing to sacrifice for the group?

Each member was also asked to give a rating between -4 and +4 for each other member on the question about how much they liked them (Theodorson, 1957: 61).

Cohesiveness was assessed using three different indices. The first was based on answers to question 3 (enjoyment), assembled for each different group member. The number of 3s and 4s (high ratings) and that of 0s, 1s and 2s (low ratings) were counted and totalled across sessions. These were then expressed as percentages and analysed by means of Chi Square (Theodorson, 1957: 62). The second index was based on answers to the Liking question (which thus plays a dual role in the results). Again low ratings, which in this case included all minus ratings plus 0, 1 and 2 were compared with high ratings (+3s to +4s) as described above (Theodorson, 1957: 62 - 63). The final index was based on answers to question 4 (sacrifice), again as described above (Theodorson, 1957: 63).

By these indices one of the groups gave consistently higher ratings than the other, and thus Theodorson was placed in a position where he could make a test of his hypothesis that role differentiation varies with cohesiveness. To do this he first totalled

each person's received ratings, at the end of each session, on Liking, Ideas (question 2) and leader status (question 1). These were then averaged across sessions, and linear correlations (not specified, but presumably Pearson's Product Moment - see Yaremko et al., 1982) were calculated from the means, although for some reason session 4 was consistently excluded from the analysis (Theodorson, 1957: tables 1 to 6).

The results suggest that Ideas and Liking are uncorrelated overall (that is when results are combined across all sessions) in both the higher cohesive group, and the lower cohesive group. However, when the results for the early sessions (1 & 2) are compared with those from the late sessions (3 to 8, excluding number 4, and 6 to 8), then the results seem to suggest that in the higher cohesive group Ideas and Liking are significantly related in the later sessions but not in the earlier ones (if, that is, one accepts the rather generous probability level of .10). The two scales are not significantly related at all in the lower cohesive group (Theodorson, 1957: 65, table 5). Exactly the same pattern of results occurs between Leader status and Liking (Theodorson, 1957: 65, table 6).

What, then, do Theodorson's results tell us about role differentiation in his groups? First it has to be noted that, in virtue of having only two groups to examine, Theodorson was forced to examine them independently. On this basis it was to be hoped that his results would furnish the kind of evidence which, it has been argued, was not furnished by any other study so far considered. To some extent he has, in that the relationships between Ideas,

Liking and, in this case, Leader status are presented relative to particular groups, and to some extent in relation to stages of development. In this last respect it is to be regretted that he failed to take the analysis a stage further and examine the data session-by-session. Even had he done so, however, there are nevertheless grounds for concluding that his data tell us little about role differentiation in his groups.

If taken at face value Theodorson's results suggest that in a group that is cohesive those who are perceived to be making task contributions, after an initial period during which expectations presumably develop, are rated as being Liked. Indeed they suggest more than this. Because this conclusion is based on correlational evidence, which takes into account the entire status ordering, it can be suggested that members of a cohesive group begin, in later sessions, to evaluate the members of their group according to a consistent rank ordering across all evaluation criteria. In other words, they begin to approximate Bales' "simply ordered group" (Bales, 1953). But what of the earlier sessions? Here Theodorson's results tell us merely that Ideas, Liking and Leader status are uncorrelated. But what does this mean in terms of role differentiation? The answer is - nothing.

As a consequence of presenting the results as correlations no interpretation in terms of roles, differentiated or otherwise, can be made. That two scales are uncorrelated, that is to say are not significantly related, does not entail that the person rated top on Ideas is not also rated top on Liking, unless the correlation coefficient is 0. The problem is, as Shelley (1960) pointed out,

correlations take into account the entire ordering of group members, from the top to the bottom. Variation at any point of the status ordering, top, bottom or middle, affects the outcome. Role differentiation, however, is principally couched in terms of those who emerge as top of the scales (whether one or many), and only with those. That the same person is not, for example, ranked third on each of two scales is irrelevant, thus suggesting that correlations are entirely inappropriate (see also Gustafson & Harrell, 1970)

In other words, Theodorson's results may give some indication that Ideas and Liking become integrated in cohesive groups, after an initial period of interaction, although because of problems associated with his derivation of summary status orders (which are the same as those of Bales - see chapter 6 above) even this is contentious. The results do not, however, have any bearing on role differentiation which is necessarily masked by his analytical procedures, even if it had occured in either of his groups.

Koomen (1988) claimed to be studying role differentiation in relation to ATG. In point of fact his main focus is on the relationship between activity rate and Liking, with ATG as a moderator variable. In this respect, therefore, he is only partially studying role differentiation (in the empirical sense) since he leaves out of account task performance measures such as Ideas. Nevertheless, he justifies his approach by claiming first, that leadership, by which he means task activity, is most often measured behaviourally in terms of activity levels, and second, therefore, that participation rate may safely be substituted for perc-

eived leadership (Koomen, 1988: 128). That this is a highly dubious set of assumptions need not be elaborated here, save to note that, whatever the status of the evidence in relation to role differentiation, the literature makes it dramatically and abundantly clear that such simple-minded substitutions cannot be made; the relationship between behavioural measures of activity and perceived task contributions is simply not that straightforward (Bales, 1953 a, 1956, 1958; Borgatta, Couch & Bales, 1954; Stein & Heller, 1979; Stang, 1973; Stang et al., 1976; Shelley, 1960, amongst others).

Koomen argues, following Smith (1963), that ATG is an individual level variable, and should be treated as such. Accordingly he adopts individual level analytical procedures. His results, like those of Smith (1963) were assembled into five sets according to activity rank. He informs us, for example, that set A consisted of all those subjects who ranked highest in their group according to participation. Thus, also like Smith, and Bales, in some cases, before him, Koomen divorces his data from the group context within which they were gathered, and that context cannot be reconstructed from his data. This sort of procedure has already been criticised above (see chapter 7, pp 254 - 255). It does mean, of course, that whatever the merits or otherwise of Koomen's study, it is incapable of providing <u>any</u> evidence of role differentiation, in the empirical or conceptual sense, since the results are not analysed at the group level. Koomen, that is to say, did not actually study his <u>groups</u>, and therefore does not provide evidence at the group level.

In sum then, although the argument with respect to the relationship between ATG and role differentiation has been persuasive for several researchers, and perhaps deserves to be considered seriously, none of the studies considered here which claim to test the relationship, provide any <u>evidence</u> that role differentiation occurs in relation to ATG or otherwise. That is, there is no evidence that in <u>any</u> of the groups examined within these studies did a state of affairs emerge in which one person was rated top on Ideas, or an equivalent measure, and a different person was rated top on Liking.

5.3. ARGUMENTS IN RELATION TO COMMITMENT AND LEGITIMACY.

The twin concepts commitment and legitimacy are analytically distinct. Nevertheless, as they are deployed within the role differentiation literature they are clearly related, indeed related so closely that for present purposes they can be treated as a single concept. The basic idea, as with the cohesiveness argument given earlier, is very simple, and stems mainly from the critical comments made by Verba (1961). Roughly, the argument as it appears in Verba's account is that where task activities are seen as legitimate within a group, then the person who is seen to make the greatest contribution to task accomplishment is rewarded with positive affect and vice versa (Verba, 1961: 142 - 184). As clear as this sounds, however, it is beset with some ambiguity.

In Verba's account the legitimacy to which he refers relates to <u>taking the lead</u> in task activity. Thus he argues that in situations typified by the "laboratory group" no one individual within the group is seen to have any especial <u>right</u> or <u>responsibility</u> to

take the lead in task, or indeed any other kind of activities (Verba, 1961: 170 - 172). In other words leadership attempts, or more precisely what are perceived as attempts to dominate are not regarded as legitimate. Thus the person making such attempts is not Liked, and another person becomes best-Liked group member. This is the point, of course, where Bales' arguments about social-emotional specialists enter.

Burke (1967, 1972) repeats and extends this argument. He presents his version in five stages:

1) Task acts generate tension and hostility if they go beyond "a legitimate expected level", a concept that he leaves deliberately vague.

2) Subject to condition 1 above, when there is inequality of participation in the task area, the person most active in this area is seen to be the primary source of undesired non-legitimate change, and is consequently the target of hostility.

3) The person who is thus illegitimately high in task activity is likely to be preoccupied with task action and is therefore unlikely to be engaging in social-emotional activity.

4) As the principal source of destabilising tensions, the task specialist, as defined above, is unlikely to be able to resolve the tension, and therefore someone else has to do it.

5) Therefore, subject to conditions 1, 2, & 3 above, role differentiation occurs. (Burke, 1967: 392, 1968: 404 - 405. See also Burke, 1972: 529 - 531).

It is noteworthy, however, that in Burke's empirical translation of the concept, there is a subtle change of emphasis. His attempts to manipulate legitimacy of task activity, become manipulations of commitment (and interest) in the task, that is to say there is a shift towards an operationalisation in terms of legitimacy of the task itself (see also Secord & Backman, 1974; Wilson, 1969). There

are elements of this in Verba's original account as well (Verba, 1961: 150).

The concern with legitimacy of the task itself makes sense conceptually, but it is not equivalent to legitimacy of task activity by any particular group member. The group, even though committed to the task, could still be resentful of dominance attempts (Brown & Hosking, 1984. See chapter 3). On the other hand, of course, one could argue that where commitment is high, which therefore implies that engaging in the task is in some sense legitimate, those who are seen to provide the greatest contributions towards task accomplishment will not create tensions, because they are helping the group to achieve what it wants (Secord & Backman, 1974). Therefore there is no need for social activity to restore balance, and therefore no role differentiation. It is the same argument given earlier in the cruder language of Liking. It is essentially also the argument presented by Gustafson and Harrell (1970) and Turk (1961 a).

It can be seen, therefore, that arguments initially couched in terms of legitimacy are also intimately concerned with the concept commitment. It is for this reason that they are being treated as equivalent here; all of the studies which deal with the concept legitimacy emphasise commitment to the task (Burke, 1967, 1968, 1972; Gustafson, 1973; Gustafson & Harrell, 1970; Turk, 1961 a, b; Turk & Turk, 1962; Wilson, 1969).

The arguments about legitimacy stem principally from concerns about the artificiality of the traditional laboratory group, and

with the "reality", or otherwise, of laboratory tasks. Wilson (1969) makes the point this way:

> "Although not true in all experiments, in discussion-group research it is usually clear to the subjects that the task is not real; that is his [sic] work is not relevant or productive since anything he produces is of no external value. ... Thus, one feature of the discussion-group experiment is that, for the subject, the experimental task product is worthless or useless." (Wilson, 1969: 221).

The view expressed in this passage is based on the naive assumption that "unreal" tasks are necessarily considered not worth doing, or not worth doing seriously, by those who are asked to perform them. In other words, it is a view which asserts that where a group task is perceived as "artificial", in some sense, then necessarily there will be little or no commitment to perform it. In other words, the task will not be seen as legitimate, again in some unspecified sense. The corollary is that if a task is perceived to be legitimate, then it will generate commitment. This view, however, can be challenged on the grounds that, first, novelty and interest can create their own legitimacy, and therefore generate commitment, and second, that tasks which are perceived to be legitimate can, nevertheless, also be seen as trivial and boring, and therefore generate resistance and lack of commitment.

Nevertheless the basic point that Wilson and others raise needs to be taken seriously. The task, whatever it is, may or may not generate commitment, but fairly obviously levels of commitment and perceived legitimacy are likely to have <u>some</u> effect on the process and outcome of group activities. Therefore one needs to be sensitive to these levels and take them into account in any analysis of

group processes (see also Burke, 1972; Gustafson & Harrell, 1970).

5.4. THE EVIDENCE IN RELATION TO COMMITMENT AND LEGITIMACY.

Several of the studies named earlier have already been argued to be either not pertinent to present concerns in terms of <u>evidence</u> for or against role differentiation (Turk, 1961, a, b; Turk & Turk, 1962), or have been examined and found not to present evidence of the sort which allows one to say whether role differentiation has or has not occurred (Gustafson, 1973; Gustafson & Harrell, 1970). This leaves the studies by Burke (1967, 1968, 1972) and Wilson (1969).

Wilson (1969), as noted earlier, was interested in the effects that "relevance of task" and observation of the group had on the outcome of role differentiation (separation between Ideas and Liking). He studied 20 five-member groups, all composed of paid male undergraduates. These were recruited through a newspaper advertisement, and steps were taken to ensure that they were not acquainted with one another (Wilson, 1969: 222 - 223). The groups were asked to write, as a group, human relations case studies around common problems of campus life. At the end of the session participants completed a questionnaire which asked group members to rank order one another according to best-Ideas and Liking.

The design of the study was a two by two factorial design giving four conditions based around two factors: Task-relevant, Task-irrelevant; Observed, Unobserved. The task relevance manipuation failed, however, and was therefore dropped from the analysis. Post session interviews showed that the majority of subjects either

forgot the relevant information that was designed to manipulate their commitment, or gave it little heed. This is a familiar story. Gustafson and Harrell (1970) also tried to manipulate commitment, and failed. Wilson makes an important point here, however: his subjects, it seems, felt an obligation to take the task seriously and arrive at a conclusion whatever the condition they were assigned to (Wilson, 1969: 224).

For each subject the rankings they each received for Ideas and Liking were totalled separately. Those members who received the highest or second highest totals within each group were assigned, for the purposes of analysis, into a "High-rank group", and the remaining three were assigned to a "Low-rank group". Thus each of his subjects was assigned to one, and only one, of four categories with respect to Ideas and Liking: High Ideas, High Liking; High Ideas, Low Liking; Low Ideas, High Liking; Low Ideas, Low Liking. Since these were also tabulated according to the Observed and not-Observed conditions there were thus eight independant cells of a contingency table showing the total numbers of group members, in the observed and not-observed conditions, who were ranked high on one or both of Ideas and Liking (Wilson, 1969: 229, table 2).

Wilson's method of separating his subjects into different analytical groups is, practically speaking, the same as Bales' percentage coincidence method, except that Wilson takes into account rank orders 1 and 2. Since he has also reassembled his data according to individual scores, his analytical procedures are similar to some of those adopted by Gustafson (1973), Koomen (1988), and Smith (1963) which were argued earlier to be unable to provide

evidence of role differentiation in virtue of divorcing the data from the group context within which they were gathered. Wilson's data are also divorced from their group contexts; they are assembled in such a way that it is not clear exactly how they relate to his groups. We are, however, in a somewhat better position with regard to his data than in the cases given above.

Because Wilson reassembled his data into independent mutually exclusive categories with respect to rankings on Ideas and Liking, and because all of his groups had five members, it is possible to show deductively that in at least 3 of his groups there was one person ranked top (by his methods) on Ideas, who was ranked at best only 3rd on Liking. It is also possible to show that in at least 4 of his groups there was one person ranked top on Liking but at best only 2nd on Ideas. Thus role differentiation in the empirical sense must have occurred in some of his groups, assuming that his measurement and analytical procedures are valid.

No further conclusions can be drawn in respect of role differentiation from these results. It is not clear how the two totals indicated above relate to one another, and of course role differentiation, as defined by Wilson's measurement procedures, may have occurred in more of the groups than the total of three or four derived above. Nevertheless, this is the first clear indication anywhere in the literature that something which looks like role differentiation must have occurred in some of the groups studied. It is, however, flawed as evidence. First because, as Wheeler (1957) observed in relation to Bales' work, there is no indication that the person ranked top is top in anything other than a very

marginal sense. Second, because there is no indication whether the person ranked top was anything other than the best of a poor sample. And third, because, as argued earlier (chapter 7) the use of simple means (or totals) to summarise emergent status orders is not a valid technique.

The studies by P.J. Burke (1967, 1968, 1969, 1972) constitute the most serious attempt to test and refine the role differentiation hypothesis in the literature. Those conducted in 1967 and 1968 are separate studies; that of 1969 is an extension of the 1967 study, in the sense that it is based on the same data; and the paper of 1972 is a summary of the 1967 and 1968 studies.

The 1967 study involved 21 groups, 10 of 5 members and 11 of 4 members, composed of undergraduate students, who were involved as part of a course requirement. The groups met for one session of 30 minutes, during which time they were asked to discuss a human relations case (for example "Jonny Rocco" from Schacter, 1960 - see Burke, 1967: 383). "Task legitimacy" was measured by observer ratings of the acceptance of a "task ethic" during the group discussion (Burke, 1967: 386).

At the end of the session participants were asked to give a rating for each other on each of 11 items using a 10 point scale (Burke, 1967: 384). Paraphrased, these items were:

1. Providing fuel for discussion by introducing ideas and opinions.
2. Doing most to guide the discussion.
3. Joking and kidding.
4. Doing most to keep relations between members cordial and friendly.
5. Making most attempts to influence the group's opinion.

6. Being the most successful in influencing the group's opinion.
7. Providing clarification during the discussion.
8. Liking.
9. Standing out as leader in the discussion.
10. Making tactful comments to heal any hurt feelings.
11. Providing the best ideas for discussion.

Ratings received on each of these scales were averaged for each person rated, and the averages were:

> "... standardised within each group, across the members, to have a zero mean. This was done in order to eliminate idiosyncratic differences in the average level of ratings from individual to individual." (Burke, 1967: 384. See Burke, 1972: 532 for more details).

These scores were then factor analysed and two orthogonal factors retained which accounted for 82% of the variance. These factors he referred to as the task factor and the social-emotional factor. Taking the factor loadings for each item listed above, factor scores were generated for every member of each group, thus yielding a measure of "task leadership performance" and "social-emotional leadership performance" for each participant (Burke, 1967: 385. See also footnote 19 on the same page). On the basis of these measures the task specialist (Burke uses the term task leader) and the social specialist of each group were identified, being the persons with the highest task and social factor scores respectively. He compared this method of identifying group specialists to that employed by Bales (and everyone else), and, somewhat too blithely, indicates that in 81% of cases his method yields an identical result with respect to the task specialist (and also, therefore, yields a 19% miss rate). For the social specialist the concurrence between the methods yields an identical result in only 57% of cases (and therefore a miss rate of 43%).

Two measures of inequality of participation on the task dimension were generated: first the variance of the task factor scores within each group (task variance) and the task factor score of the task specialist (task score).

Using the task and social factors as orthogonal axes in a Cartesian coordinate system, Burke was able to plot the positions of those whom he had identified as task and social specialists, and calculate a graph distance measure between them. This provided a measure of role differentiation, something that no other researcher had attempted.

Burke tested two "working hypotheses" using these data:

That "legitimation of task activity in a group":

1. prevented the task specialist from being disliked, and
2. freed the task specialist from having to concentrate too heavily on task activity, allowing him or her to engage in social-emotional activity.

As a subsidiary hypothesis to the second one he suggested that:

2a. where legitimation of task activity is low, someone other than the task specialist must handle social-emotional activities (Burke, 1967: 390).

To test the first he calculated correlations based on the task variance of the group, and the task score of the task specialist against the mean Liking score received by the task specialist. To test the second he calculated correlation coefficients between the task scores of task specialists and their respective social-emotional scores. To test the subsidiary second hypothesis, he calculated correlation coefficients between the task variance of the group, the task score of the task specialist, and the measure

of role differentiation (graph distance) between the task and social specialists. All three hypotheses received some corroboration in his results, in particular the coefficients between the measures of task inequality and the measure of role differentiation were significant ($p < 0.05$) in the low legitimation groups, but not in the high legitimation groups (Burke, 1967: 389, table 3).

Burke (1968) repeated, with some modifications, the procedures adopted in 1967, using 12 groups of undergraduates (the number of members in each group was not specified). In this study Burke attempted to manipulate, rather than simply measure, the levels of legitimation afforded the task by the group members. All groups were told that they would be judged on the outcome of their discussions. After an initial discussion of 25 minutes, and prior to a second discussion session (also of 25 minutes) groups in the high legitimation condition were told that they had scored only 140 compared to a fictitious average score of 150. Groups in the low legitimation condition groups were told that they had scored 160. This, it will be noted, is a direct attempt to manipulate some form of commitment.

Participants were asked to rate one another on 8 items; 4 task and 4 social (Burke, 1972: 540) at the end of each discussion session. Six of these were listed earlier as items: 1; 2; 4; 5; 9; 10. The following items were also included (the numbers are those given by Burke, 1968: 407):

6. Attempting to harmonise differences of opinion.
7. Intervening to smooth over disagreements.

Two hypotheses were tested:

1. That correlations between measures of inequality of task participation and role differentiation will be greater in the low legitimacy condition than in the high legitimacy condition, and
2. That there will be an inverse relationship between task and social-emotional scores of the task specialist in low legitimation conditions (Burke, 1968: 409).

These were tested using correlations calculated first between the measures of inequality of participation (task variance and task score of the task specialist) and the graph distance measure of role differentiation, and second between the task and social scores of the task specialist. In both cases the hypotheses received corroboration (Burke, 1968: 408 - 410, tables 2 & 3 respectively).

Finally, in 1969 Burke set out to test Bales' proposition that "scapegoatism" might operate as an alternative mechanism to role differentiation by which groups deflect negative affect from the task specialist. In other words he tested the proposition that in low legitimacy conditions groups might displace negative affect onto a low status group member, which in this case meant the lowest status member on the task dimension (Burke, 1969: 163). In formal terms he tested three hypotheses:

1) When legitimacy is low, the greater the activity of the task specialist, the greater will be the amount of displaced hostility directed towards the lowest status member.
2) When legitimacy is low the greater the amount of displaced hostility directed towards the lowest status member, the less will be the hostility directed towards the task specialist.
3) When legitimacy is low the greater the amount of task activity by the task specialist, the less will be the hostility directed towards him or her.

In all cases he expected no relationship between the variables in conditions of high legitimacy (Burke, 1969: 160 - 161).

To test the hypotheses Burke used the same measures as he did in the 1967 study, plus behavioural measures of residual hostility received, based on totals of IPA acts in categories 10 and 12 minus totals in categories 1 and 3 (Bales, 1950 a; Burke, 1969: 163).

By and large Burke claims corroboration for the hypotheses advanced, although he is careful to point out that his sample is too small to support adequately strong general conclusions (Burke, 1969: 167). Nevertheless, the most important conclusion he draws is a modification of a conclusion he drew earlier. In Burke (1967) he concluded that in conditions of low legitimacy the greater the amount of task activity on the part of the task specialist, the greater the amount of hostility he or she would receive, and consequently the less Liking he or she would receive. In Burke (1969) this is modified to included the clause "unless hostility is not displaced onto a scapegoat" (Burke, 1969: 161 - 162, footnote 3).

So, the question to consider now is the status of Burke's data in terms of evidence for or against the proposition that role differentiation occurs. In other words, can it be claimed, on the basis of Burke's results that role differentiation occurred in one or more of his groups? The answer is obviously yes, providing his analytical methods can be taken as valid. Role differentiation is implicit throughout his results in virtue of the graph distance

measure that he employed. Thus, although he doesn't locate and identify role differentiation in any particular groups, the fact that he is able to calculate correlations with his measure of role differentiation at all implies that he must have had positive values on that measure. Any value of this measure above zero indicates role differentiation. It would have been more useful, of course, if he had given summary tables of the values of his role differentiation measure group by group. Nevertheless it can be claimed with some confidence that, according to his measurement and analytical procedures Burke does provide evidence that role differentiation occurred in at least some of his groups, and that its occurrence apparently coincided with levels of legitimacy or commitment to the task he set his groups (again with the proviso that his measurement and manipulation of legitimacy has construct validity).

There are, however, difficulties with his procedures. The graph distance measure of role differentiation has, for example, attracted some criticism. Lewis (1972) claims that Burke's measure

> "does not ... lend itself readily to measuring the converse of role differentiation, viz. role integration." (Lewis, 1972: 431).

It is obvious, however, that Lewis has missed the point. Burke's measure of role differentiation is perfectly adequate for indicating role integration. When task and social roles, as defined by Burke's procedures, are vested in one person, the measure returns a value of zero. Lewis also makes some errors in interpretation since he defines a situation of maximum role differentiation by Burke's method incorrectly (Lewis, 1972: 431, text and figures 1 & 2).

The problems with Burke's procedures are more fundamental than just his measure of role differentiation; they centre on the initial identification of specialists. First Burke's procedures are based on a factor analysis of his results. In itself this is not a problem, but he derives one set of weightings derived by pooling results across all his groups. The logic of his procedures would suggest, however, that he ought to have calculated his weightings individually for each of his groups. That is he should have factor analysed the data group by group. The reason for this is obvious. If the different sociometric scales are thought to contribute differently to task and social factors according to context, then a set of weightings cannot be derived across groups - the appropriate weightings might be considerably different from group to group.

Second, because Burke's factor analysis is based on mean ratings (corrected for idiosyncratic effects) the question can be raised about whether its basis is adequate. This is related to the criticism raised several times so far that the use of simple means derived from interpersonal data is not valid. The reason it is not valid is because it rests on the assumption that simple means reveal the true structure of the data, but because such a technique necessarily clouds or ignores possible complex structures (such as sub-groups), this assumption is not warranted.

Third, and related to the point just made, insofar as different methods for deriving simple means from the data can provide dramatically different orderings of the data, in particular identifying different status orders, then the knock-on effect on derived

correlation coefficients can be equally dramatic (see for example Prince, 1987, where values of Spearman's Rho from -0.7 to +0.81 were derived from one set of figures). Thus, since factor analysis is a complex multidimensional correlational technique (Yaremko et al., 1982) one can raise questions about the extent to which the derived factor loadings have been distorted by the method, that is the extent to which they are artifacts of the method rather than true reflections of the structure of the data.

Finally, because Burke took his factor loadings, and used them to derive weighted estimates for each person, by multiplying the mean rating each person received on a specified sociometric scale by the factor loading derived for that scale, then the sources of possible error themselves become multiplied. He has, in effect, multiplied a rating which is of dubious validity by a factor score the validity of which is also in doubt. Thus the task factor scores, and the social-emotional factor scores upon which Burke identifies task and social specialists are, although highly sophisticated, questionnable.

Nevertheless, there are important features of Burke's work which should not be overlooked. The most obvious is his operationalisation of perceived social-emotional activity. He has extended the range of questions asked so as to include the kinds of activities which Bales claims are the substance of social-emotional contributions. Although Burke cites Davis (1961) as his source for several of the questions he asked (Burke, 1967: 384, figure 1), it is clear that his questions relate very closely with the picture of social-emotional acts embodied in IPA (Bales, 1950 a - see figure

2.1., p 62 above). To this extent Burke's approach is more in harmony with the spirit of Bales' conception than even Bales' own work.

Burke's attempt to develop a procedure which allowed for differential weightings of the sociometric scales should also not be overlooked. Again this is more in the spirit of what Bales appeared to have in mind than Bales' own approach. Certainly Burke's method is considerably more sophisticated than any other to be found in the literature, and seems to capture the whole point of the role differentiation hypothesis.

Alas, sophistication is not a guarantee of validity. Although Burke very clearly goes a long way towards testing the role differentiation hypothesis in the terms that Bales set conceptually, and, indeed, presents evidence which according to his measures suggests that role differentiation does occur in some groups, it is with the greatest reluctance that one is forced to conclude that his measures are flawed to the extent that a question mark must be placed against them. In other words, although there is evidence of role differentiation in Burke's results, it is questionnable and cannot be accepted without considerable reservation.

In sum then, the studies examined in this section - those of Wilson (1969) and Burke (1967, 1968, 1969, 1972) - both provide some evidence that role differentiation of one sort or another occurred in their groups. In both cases, however, the evidence was indirect and contentious, and therefore could not be accepted without reservation. In other words, what evidence there is that

role differentiation ever occurs in identifiable groups is very weak.

6. SUMMARY AND CONCLUSIONS.

This chapter has presented a systematic critical examination of those empirical studies which their authors or others have claimed as tests of the role differentiation hypothesis. It has been argued that many of the studies do not, in point of fact, represent tests of the role differentiation hypothesis in the terms set by Bales, either because they do not measure and examine the same phenomena, or because they were conducted in social settings which are sufficiently different to those within which Bales conducted his studies to exclude them as fair tests.

Of the remaining studies, it has been argued that in almost no case is there any evidence that role differentiation occurred in any particular groups studied, principally because the analytical techniques typically employed do not allow inferences to be made at the specific group level. The studies of only two authors allowed any inferences to be drawn with respect to particular groups. In these, role differentiation may have occurred, if it is allowed that the procedures adopted for deriving summaries status orders is valid. The information, however, had to be derived deductively - there was no attempt in either case to present direct evidence at the group level. Because of this, estimates of the frequency with which role differentiation may have occurred, as opposed to, for example, role integration, are impossible to derive. The methods for deriving summaries were, however, of the

same sort used by Bales, that is simple means calculated on the basis of ratings or rankings received, and this procedure has already been argued to be invalid and unreliable.

Nevertheless, the arguments which some researchers have presented in relation to cohesiveness (ATG) and legitimacy (or commitment) have been argued to be of sufficient importance that they should be considered seriously in any attempt to study role differentiation, assuming that evidence for role differentiation can be found.

7. GENERAL CONCLUSIONS FOR PART 2.

As an overall conclusion to the empirical part of the thesis, it has been argued and demonstrated throughout that nowhere in the published literature is there any good evidence that role differentiation ever occurs in specific identifiable groups. What there is tends to be weak and indirect. Furthermore, as Hosking and Morley observe, albeit in a different context:

> "Even when definitions are made explicit, they are often far from being implemented in subsequent measurement procedures". (Hosking & Morley, 1984: 5).

In the present case, only three researchers bothered to provide definitions of role types and role differentiation (Bales, e.g. 1958; Burke, e.g. 1972; Gustafson, 1973). With the exception of Burke's studies, however, these definitions appear to play no obvious part in the analyses. This is a consequence of the fact that in every study examined in section 2, that claimed to be a study of the role differentiation and the role differentiation hypothesis, the unit of analysis was always something other than the group. Some studied the individuals within groups, but most

studies were conducted at an aggregate level which pooled data across groups and group sessions. It is at the group level, however, that all explanations are articulated, which suggests that in most cases it is the specific group which is intended to be the focus of attention.

Overall, then, it would appear that there is some necessity for an examination of role differentiation which is conducted in terms of individual groups. This, necessarily, implies a somewhat more clinical orientation to the data and analyses than that typically adopted in the literature. There is also some need to consider very carefully the approach adopted towards deriving summaries of group structure. With these issues in mind, then, we turn to the empirical work conducted for the thesis.

PART 3: METHOD AND RESULTS.

CHAPTER 9: OVERVIEW OF METHOD.

1: INTRODUCTION.

The preceding chapters have presented a detailed, systematic and critical examination of the role differentiation hypothesis as it appears conceptually and empirically. It has been argued that the basic proposition, the bifurcation of the leadership function into task and social specialisms in relation to what Bales (1953 a) calls the equilibrium problem, can be successfully integrated into a coherent theory of groups and leadership articulated in terms of negotiated social order. The proposition fares less well empirically, however.

By far the bulk of the empirical literature which claims to examine the role differentiation hypothesis does so in terms of general trends using data aggregated across groups and group sessions (e.g. Bales, 1958; Bales & Slater, 1955; Gustafson 1973; Gustafson & Harrell, 1970; Slater, 1955). Other studies concentrate on the attributes of individuals within groups, taken either generally or identified according to some specific criterion such as being rated top on Liking (e.g. Bales, 1956, 1958; Bales & Slater, 1955; Koomen, 1988; Smith, 1963; Wilson, 1969). In no case, however, is there any evidence presented which demonstrates unequivocally that role differentiation, the emergence of separate task and social

specialists, ever occurs in any identifiable groups. To be sure the studies by Burke (1967, 1968, 1969, 1972) and Wilson (1969) present their results in such a way that role differentiation, in some sense, can be inferred to have occured, but in both cases the evidence is oblique and has to be derived deductively. Overall there is no direct evidence of role differentiation. In other words, it has yet to be demonstrated that role differentiation ever occurs in relation to specific identifiable groups. That, therefore, is the principal aim of the empirical research within this thesis, which therefore will be focussed on the search for evidence that within some specific identifiable groups there emerge identifiable individuals who separately perform task and social roles, however defined.

The remainder of this chapter presents an overview of the research aims and methods, and clarifies, briefly, some of the issues introduced in earlier chapters which are relevant to the procedures adopted. Some of the problems of conducting the research are also briefly noted.

2. STRUCTURE AND RATIONALE OF THE RESEARCH PROGRAMME.

The original projected structure of the research programme was to move systematically from the laboratory to the "real" world in stages, studying small groups of the kind already discussed extensively elsewhere in the thesis. Thus, as originally conceived, the research was intended to begin with laboratory groups composed of undergraduates, move on to some kind of half-way group, also composed of undergraduates, and finally concentrate on groups

which were convened by people other than the researcher for purposes other than research, in a context completely divorced from a university setting, and composed of people who were not undergraduates. The rationale for this approach is very straightforward.

First, the availability of undergraduates to take part in this kind of research makes them an asset not to be lightly ignored. Such a freely available pool of potential participants presents the possiblity of gathering large amounts of data, which might not be possible otherwise. Furthermore, as argued earlier, undergraduates represent a reasonably good approximation to the kind of person that comprised the membership of the groups which stimulated the research in the first place (see chapter 1). Nevertheless, the arguments against the use of undergraduates as subjects (e.g. Douglas, 1983; Turk, 1961 a, b; Verba, 1961) cannot be ignored entirely. Any study which aims at a general understanding of groups, as opposed simply to undergraduate groups, must move away from total reliance on students to populations outside the university.

Second, convening groups in a laboratory also presents advantages. The laboratory, in virtue of being designed specifically as a context for research, allows for close observation of group interactions without directly affecting them. Moreover the laboratory also presents the opportunity for making a permanent audio-visual record of the group session, which is useful, indeed essential, for some kinds of analysis (e.g. behavioural analysis).

As with the use of undergraduate participants, however, remaining in the laboratory is not acceptable if the research is to have relevance beyond the laboratory door. Although it has been suggested earlier that the arguments against the use of laboratory groups are less well formed than they appear prima facie, nevertheless the point is well taken that laboratory groups, in virtue of being convened specifically for research and observation, might be systematically different in some way from groups meeting under other circumstances (Douglas, 1983; Tajfel, 1981; Turner & Giles, 1981; Verba, 1961; Wilson, 1969). Allied to this, of course, is Wilson's point that laboratory groups are typically set tasks which have no relevance beyond the laboratory door, and that this might also have serious systematic affects on the outcome of interaction (Wilson, 1969).

It was considered that making a transition from the laboratory directly to the "real" world would, however, represent too great a leap. Studying groups that were not convened with research in mind involves a substantial loss of ability to direct the proceedings for the purpose of gathering data. Hence the decision to find a half-way position. In the present case this was represented by tutorial groups that the researcher was teaching. As part of the teaching method a large group of students was split into small groups of between four and six, and asked to discuss topics relevant to their course. Some of the groups agreed to take part in the research. These groups, composed of volunteers, undertook exactly the same tasks as other groups working alongside them who were not taking part in the research. The only difference was that they were asked to complete questionnaires at the end of the group

session (see appendices C & D). In research terms this was considered to be an acceptable compromise between the laboratory and the real world; groups undertaking "real" tasks, that they would be expected to undertake even if not taking part in research, but under circumstances that allowed fairly close observation of their interaction (although without the opportunity for audio-visual recordings).

The only real disadvantage of the tutorial groups related to their being composed of undergraduates, although there were also some difficulties in arranging sessions so that data could be gathered before they were required to attend lectures. It was, however, still considered important to try and make the full transition to non-laboratory groups meeting totally outside a university context.

In the event gaining access to groups outside the university proved to be almost impossible. Several groups agreed to take part, only to pull out at the last moment, usually, so it seems, at the instigation of one particular member. Interestingly the stated reason most often given was because the study was a social psychological one, although even when this feature of the research was not stated there remained a general reluctance to be the object of study.

One group, however, did take part and provided data for one session, before pulling out. Unfortunately the data were not usable. Because the group was a closed one, the researcher was not permitted to be present, and this resulted in one of the questionn-

aires being completed incorrectly thus rendering the entire set of results impossible to interpret. Hence this group has not been included in the results.

Overall, then, although the intention was to conduct the study in three main phases (laboratory, transition and real world) in the event data were only available for the first two phases.

In addition to the main phases outlined above, a decision was made early on to gather data over several sessions for as many groups as possible. As it turned out it was only possible for the tutorial groups, and then with difficulty. Nevertheless there are sufficient data available to make a time series analysis possible and worthwhile. A complete record of the groups studied, their composition, measuring instruments used and size, is given in appendix B.

3. FUNDAMENTAL ASPECTS OF ROLE DIFFERENTIATION.

Before describing the kinds of measurements which were made, it is essential to clarify the view taken here about which aspect of the role differentiation hypothesis is taken to be fundamental, and which therefore underlay decisions about measurement procedures.

It has been noted previously that there is some confusion in the literature as to whether the role differentiation hypothesis is a behavioural or perceptual proposition. This confusion is not confined to commentators, but is also evident throughout Bales' original presentations (see, for example, Bales, 1953, 1956, 1958; Bales & Slater, 1955). From the way in which Bales discusses the

hypothesis, and the nature of the data presented, the safest inference is that it is intended to be both, and in point of fact both sorts of data are presented (see chapter 5). Nevertheless, the view taken here is that it is the perceptual sense which is more fundamental, and to which priority must be given. This claim rests simply on the fact that Bales, in his analytical procedures, gives priority to his perceptual data, although it is also consistent with the general view of leadership adopted earlier in the thesis (chapter 4). The point is easy to support.

Bales frequently discusses task and social specialists in terms of task and social activity, and offers behavioural (IPA) data as part of his evidence in support of the role differentiation hypothesis. **Nevertheless the behavioural analysis is always subordinate to the perceptual analysis.** The composite behavioural profiles that are presented in the original studies (Bales & Slater, 1955; Slater, 1955 - see tables 5.10 & A.7) are of those individuals whom Bales and Slater identify as best-Liked and top on Ideas, based on the results derived from their sociometric questions. That is, decisions made on the basis of the perceptual results were used to select those individuals who were to be examined behaviourally. In other words, the behavioural evidence is driven by the perceptual data, and does not stand independently.

Therefore, to examine the role differentiation hypothesis in Bales' terms one cannot look for evidence of behavioural role differentiation independently of perceptual data, and it is the perceptual data which takes priority. This suggests questionnaire data.

4. MEASURING INSTRUMENTS.

The questionnaire was used as the principal measuring instrument. Two different versions were used; the Warwick Questionnaire (WarwQ) which was developed for an earlier study (Prince, 1983), and the Small Groups Questionnaire (SGQ or WarwQ version II) which is an extension and modification of the WarwQ. The WarwQ was used in the early stages of the research, and the SGQ in the later stages.

It must be emphasised at this point that because of severe time constraints decisions were made with respect to data collection before most of the critique, presented earlier, was completed. As a consequence a great deal of data were gathered which will not be used in the results sections, and some data were not gathered which would, in retrospect, have been useful.

4.1. THE WARWICK QUESTIONNAIRE (WarwQ).

The WarwQ comprised of six sociometric questions using an uncalibrated ratings scale set at 100mm long (see appendix E). Three of the questions, Ideas, Guidance and Liking, were taken directly from Bales (e.g. Bales & Slater, 1955). The others comprised of two questions relating to leadership functions (question 4) and leaderlike behaviour (question 6), and one question asking about preference for future colleagues (question 5).

In addition to the sociometric questions there were seven other questions, loosely referred to here as attitude scales for want of a better term. These comprised two questions relating to personal

enjoyment and satisfaction (questions 7 and 12); one question aimed at assessing a general response to the procedure in terms of a willingness to repeat the experience (question 8); two questions aimed at assessing general attitudes towards leaders in small groups, in terms of the necessity for them (question 9) and preference (question 14), in addition participants were asked to nominate their preferred choice (if any) for future leader of the group (question 13); finally two questions, taken from Smith (1963), were intended to assess attraction to the group (ATG) as a general measure of cohesiveness, in terms of desire to continue as a member of the current group (question 10), and preference for a different group (question 11).

The questionnaire also included Fiedler's AsO (MPC/LPC) scales, taken from Hosking (1978), and the SYMLOG Ratings Form for Interpersonal Behaviour (Bales et al., 1979, appendix C). Originally the WarwQ also included a set of cognitive complexity scales, also taken from Hosking (1978), and the SYMLOG Ratings Form for Interpersonal Values (Bales et al., 1979, appendix W), but these were later excluded for reasons of parsimony.

4.2. THE SMALL GROUPS QUESTIONNAIRE (SGQ).

The SGQ comprised two parts; a pre-session questionnaire which was administered once, and a post-session questionnaire which was administered at the end of each session.

a) The Pre-Session Questionnaire.

The SGQ Part I was designed in 3 sections each colour coded for ease of data retrieval. Section 1 (green) comprised of Belbin's

Self Perception Inventory (Belbin, 1981). Section 2 comprised of the SYMLOG Rating Form for Interpersonal Behaviour adapted to yield information about personal behaviour (Self - blue) and about the ideal self (Wish - purple). These were taken from Bales et al (1979). Section 3 comprised of Fiedler's AsO (MPC/LPC) adapted from Hosking (1978) and Fiedler (1967) and the SYMLOG Rating Form for Interpersonal Behaviour adapted to yield information about the Least Preferred Co-Worker (pink) and Most Preferred Co-Worker (salmon - Fiedler, 1967). This questionnaire is reproduced (without colour) in appendix F.

The decision to gather these data was made early on in the research process. At the time it was assumed that the identification of role differentiation, should it occur, would be relatively unproblematic, and that further analyses of those identified as task and social specialists would be both desirable and possible. In addition these data would have allowed further analyses of persons taking other roles such as scapegoat (Bales, 1958; Burke, 1969), overactive deviant (Bales, 1958) and so on, and an examination of Smith's basic postulate given earlier (Smith, 1963).

As it turned out, however, the identification of role differentiation was not straightforward. Indeed identifying <u>any</u> group structure, particularly in terms of persons rated top on specific scales, turned out to be an extremely vexed issue (see Prince, 1987 and chapter 6 above). As a consequence the data gathered from SGQ Part I have been excluded from further analysis within this thesis, as have the similar data from WarwQ. It is important to appreciate, however, that these data <u>were</u> gathered, since it was a

significant aspect of the method, and it is also important to note that they are available for analysis at some future time.

b) The Post-Session Questionnaire.

SGQ Part II (see appendix G) was designed in 3 sections, each colour coded. Section 1 (green) comprised of 27 sociometric questions using the same 100mm uncalibrated ratings scale as the WarwQ. Unfortunately the vagaries of the printing process resulted in a scale 107mm long, but this didn't really present any major problems.

The questions in SGQ Part II were of three basic kinds: how much; how good; how effective. These were based around the related distinctions quality versus quantity (e.g. Sorrentino & Boutillier, 1975) and attempted contributions versus successful contributions (e.g. Bass, 1961).

The questions themselves consisted of:

Perceived talkativeness (Stang et al, 1976).

Ideas and Guidance (Bales, 1958), adapted to take account of the quality-quantity distinction (questions 2 - 4b).

Liking and Disliking (Bales, 1956, 1958; questions 5 and 8).

Clarification of important points in the discussion (Burke, 1967, 1972).

Hurt feelings and Hostility, perceived in self and others, and perceived attempts to soothe or calm them (questions 9, a, b, c - adapted from Burke, 1967, 1972).

Joking and Cordiality (questions 11, a, b, and 20 a, b - adapted from Burke, 1967, 1968, 1972).

Influence, attempted and successful (questions 17 a, b - Bass, 1961).

Questions about perceived domination attempts and overtalking (qus. 10 and 15)); levels of contribution below expectations and withdrawal (qus. 12 and 16); expectations about potential abilities (qu. 7); and Colleagues (qu. 19, taken from Prince, 1983).

In addition there were two important questions which aimed at revealing expectations within the group (qus. 13 and 14). The word "expectations", as it appears in the literature, is typically meant to refer to normative expectations (e.g. Verba, 1961). It is, however, an ambiguous word, since it can also be taken to mean something like empirical predictions (what we here refer to as anticipations). It is, as will be realised, the same distinction between "is" and "ought" referred to earlier in the thesis. It was considered important to try and capture both senses of the word, particularly since it was also felt to be extremely unlikely that normative expectations as to role performance would develop in the early stages of group life.

The questions were actually very difficult to frame. Ideally a question relating both to anticipations and expectations of future performance should have been added to each of the other sociometric questions, but this was clearly impractical since it would have resulted in a questionnaire of at least 75 sociometric scales. Therefore, the decision was made to try and frame one question of each kind in very general terms. For this the vague term "activity" was selected, although it is not entirely adequate.

It will be noted also that all the questions relating to leadership from the WarwQ (questions 4, 6, 9, 13, & 14) were excluded from the SGQ. There were two reasons for this. First, those

subjects who completed the WarwQ complained, almost without exception, that they were impossible to answer. As it turned out, however, they seemed to show remarkable agreement on their answers despite the alleged difficulty. Second, however, it was felt that including questions about leadership might somehow distort the responses, particularly in those groups meeting for more than one session. In retrospect, it was not a fruitful decision, and in future versions of the SGQ some attempt will be made to include similar questions.

Section 2 of the SGQ Part II (blue) comprised of 11 attitude scales of a similar sort to those in the WarwQ. Briefly, these were:

Three questions intended to measure ATG in terms of feelings about moving to another group (qu. 21); feelings about attending further meetings of the current group (qu. 22); and feelings about the final group meeting (qu. 29). These were adapted from Smith (1963).

Several questions about interest in the topic of discussion and the session itself (qus. 24 and 30); satisfaction with the conclusions reached and the way the topic was discussed (qus. 25 and 27); and whether the session was enjoyable (qu. 31).

One question about willingness to take part in further sessions (qu. 28)

Two questions about perceived denial of opportunity to take part in the discussion (qu. 23) and felt responsibility to engage in the discussion (qu. 26).

Section 3 (pink) comprised solely of the SYMLOG Interpersonal Rating Form for Behaviour.

5. RECORDING THE DATA.

Data from the questionnaires were recorded and tabulated on forms specially designed for the purpose (see appendix H). These were

also colour coded to match the different sections of the questionnaires, so that results could be compared directly with raw data if necessary.

The most important data, those derived from the sociometric questions, were entered into a matrix, what Bales calls a who-whom matrix (Bales, 1950 a) but which is referred to here as an interpersonal matrix. The version used here is included as part of appendix H.

Originally the data were analysed descriptively (totals, means, standard deviations, etc) by hand, using a pocket calculator, but this proved to be too time consuming and prone to error. Consequently a suite of computer programmes (called Doormat) were written to automate the procedures (appendices K and L). The programs also returned values for Kendall's Coefficient of Concordance, and a complementary statistic called Sigma (see appendix J, and section 10 below).

6. NOTE ABOUT ANALYTICAL PROCEDURES.

The principal aim of the research was to identify and examine the emergent structures of small groups for evidence of role differentiation. To do this it was necessary to identify who came top on specified sociometric scales (Gustafson & Harrell, 1970; Shelley, 1960). Moreover, it was necessary to have some indication that that person was, in some sense, the group's choice. In other words, some criterion was necessary by which the relative amount of agreement within the group that the person rated top was top

could be judged; that is status consensus. These two issues will be taken in turn in the following sections.

7. IDENTIFYING THOSE WHO COME TOP.

The most pressing problem was to find a way to identify those who were rated top by the group, whether on one or more criteria. Typically it is assumed, or implied, that there is no problem; one calculates the means of the scores received, be they ratings or rankings (see chapter 8). But it is not that simple.

It has already been argued and demonstrated that the use of simple means to derive a summary status order of a group is neither reliable nor valid (chapter 6). Mean ranks and mean ratings can give quite different orderings under circumstances that are not entirely obvious Prince, (1987). Nor is the situation much improved when alternative procedures such as that proposed by Riedesel (1974) are taken into account.

Riedesel suggested that rather than simply calculating mean ratings, because these may be distorted by idiosyncratic use of the scale by different subjects, scores should instead be expressed as a deviation from the row mean, before the column means were calculated (Riedesel, 1974; Prince, 1987). But this only serves to further complicate the issue because it presents yet another set of summaries which might be different from those derived from mean ratings or mean rankings.

The point is that there is really nothing to choose between these different methods. They each interrogate the data in different

ways, none of which is necessarily superior to the other. More important, however, none of them is adequate for the purpose intended. Each one has the same undesirable consequences in terms of identifying group structures. Apart from the rare occasions when all group members rate each other equally, all three procedures will, most of the time, return simple hierarchical structures, whatever the nature of the scores which contributed to the summary. In other words these techniques are incapable of identifying complex structures, such as groups that have formed themselves into mutually exclusive cliques, or those in which there is distributed leadership, for example. Nor are they capable of identifying those groups where there is no structure to speak of. Pollay (1968) has described the techniques as simplistic. Paul Golder, in personal conversation, has pointed out more positively that the use of simple mean summaries is equivalent to forcing a multi-dimensional situation, as represented by the interpersonal matrix, into a one-dimensional straightjacket.

To resolve the situation, and to force a way out of the impasse caused by these problems, it was decided to abandon the search for a simple summary procedure, and opt for a more clinical approach. For this purpose a return to the basics of sociometry (Moreno, 1934) was considered useful. Although not strictly in accordance with Moreno's prescriptions, the general consensus is that ratings procedures of the sort adopted here for the purpose of generating data, are sufficiently similar to Moreno's approach to make basic sociometric analysis possible and appropriate (Knoke & Kuklinski, 1982; Lindzey & Borgatta, 1954).

8. BASIC SOCIOMETRIC ANALYSIS.

This is not the appropriate place to conduct a thorough survey of the sociometric literatures, for which there exist several useful reviews (Glanzer & Glaser, 1959; Lindzey & Borgatta, 1954; Proctor & Loomis, 1951). Neither is it necessary, for current purposes, to draw clear distinctions between sociometry and related approaches, such as graph theory (Doreian, 1970; Harary & Norman, 1953) or network analysis (Knoke & Kuklinski, 1982). In terms of present concerns the most significant aspect of basic sociometry is the sociogram, which all three approaches share to some extent (Knoke & Kuklinski, 1982).

The sociogram is, essentially, nothing more than a diagrammatic representation of sociometric data (Moreno, 1934; Borgatta, 1951; Doreian, 1970; Lindzey & Borgatta, 1954). Although it is generally considered to be a useful analytical tool, it has by and large been superceded by the interpersonal matrix (also called the sociomatrix - Glanzer & Glaser, 1959). This has occurred mainly because, as researchers such as Katz (1947), Festinger (1949) and Harary and Ross (1957) have demonstrated, matrix algebraic techniques can be applied directly to the interpersonal matrix for the detection of, amongst other things, clique formation, whereas similar techniques do not exist for application directly to the sociogram (Alba, 1981; Doreian, 1970; Knoke & Kuklinski, 1982; Leik & Nagasawa, 1970; Scott & Cohen, 1978).

In many ways it is a great pity that the sociogram has been superceded. The view taken here is that the kinds of oversimplified methods for detecting group structures described earlier, could only have been taken seriously because no diagrams such as the sociogram were produced to demonstrate their short comings. Nevertheless, the sociogram also has short comings. As Knoke and Kuklinski comment:

> "Well constructed visual displays of network relations often have a dramatic impact on viewers and can convey an intuitive feel for the structure of a system. Unfortunately, a virtually limitless number of diagrams can be drawn that contain the same relational information but impart starkly different impressions." (Knoke & Kuklinski, 1982: 38).

In addition, as Knoke and Kuklinski also point out, there is a particular problem with regard to statistical analysis of diagrams such as the sociogram, and indeed of sociometric data in general, whether expressed in diagrammatic or matrix form. What tests there are available appear to be mathematically arcane, require powerful computers and software (much of which has yet to be developed), and are not very well developed (Knoke & Kuklinski, 1982: 77 -86).

On balance, however, it was felt that the problems associated with the sociogram are outweighed by the advantages, as far as present considerations are concerned. It is precisely the visual impact that we are concerned to retrieve from the abstraction of the matrix.

9. PROCEDURE FOR CONSTRUCTING SOCIOGRAMS.

Sociograms are generally, if not always, constructed on the basis of binary choice data, that is data which records either the presence or absence of a choice between two people according to some specified criterion. Indeed sociometric analysis in general

seems to proceed most often in terms of binary data (Alba, 1981; Doreian, 1970; Glanzer & Glaser, 1959; Knoke & Kuklinski, 1982; Lindzey & Borgatta, 1954; Proctor & Loomis, 1951; Scott & Cohen, 1978). Clearly the data which were derived from the sociometric questions described earlier were not of this sort, so some procedure had to be devised for transforming the scores in such a way that they were appropriate for sociogrammatic presentation.

First, the object of the analysis was to identify who, if anyone, was rated overall top on any specified sociometric criterion. To do this it was considered important to examine each individual member's ratings of the other members of his or her group. In effect this meant extracting the information from the interpersonal matrix row by row, noting in each case who was given top ratings.

Being given top rating, however, was alone insufficient for anyone to be considered top. It was important, given the theoretical background to the research, that whoever was rated top was also rated positively on the criterion of judgement. For example, if, on a criterion of Liking, using a scale of 0 - 100, person A gave person B a rating of 10, it is hardly to be considered that B has therefore received any particularly noteworthy accolade, even if it is the top rating that A gave to anyone in the group. On the contrary, and in such a case it seems preferable to conclude that A has not chosen anyone in terms of Liking.

In addition to the requirement that whoever was identified as top be rated positively on the specified criterion, it was also consi-

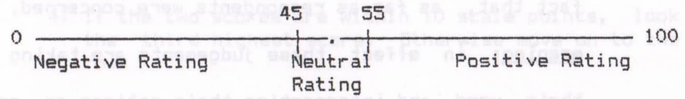
idered important that whoever was chosen as top should also be clearly top, and not merely marginally ahead (Burke, 1967; Lewis, 1972; Olmsted, 1959; Wheeler, 1957). Therefore, some criterion of differentiation was required.

With these considerations in mind, the following procedure was developed.

9.1. DIVISION OF THE SOCIOMETRIC SCALE.

The scales used for measurement were, it will be recalled, 100mm long (give or take the capriciousness of the printing press). Each one was anchored at either end with a descriptive statement which was either positive or negative. In this respect the ratings scales have some similarity with the semantic differential of Osgood, Suci and Tannenbaum (1957). It should be noted, however, that in each case care was taken that the negative pole was defined by an absence of the choice criterion, rather than its contrary. Thus Liking, for example, is counterposed with Not-Liking rather than Disliking.

For the purposes of sociogrammatic analysis the scale was divided into three zones, as follows:



The boundaries of the three zones were arbitrarily chosen. They could presumably have been derived empirically, but for present purposes that didn't seem to be worthwhile. The reason for making the middle zone narrow is that beyond 55 the ratings seemed to

reflect clearly positive intentions, and similarly below 45 they appeared to be clearly negative.

Only those scores which fell within the positive rating area were considered as potential top ratings. Thus those people who rated everyone equally at 50 (the mid-point) were considered not to have made any choice. Similarly, those who gave a top rating within the neutral rating zone were considered to have made no choice.

The reason for these decisions is simple. Group members were **invited** to record their judgements of the the other members of their group according to the named criterion. The mid point was clearly marked on each scale (see appendix F), so the scale itself was clearly divided into positive and negative areas. Therefore, respondents were given the opportunity to make clear qualitative judgements in terms of the named criterion; those who wished to make high ratings could see precisely where they needed to mark the scale. Similarly so for those respondents who wished to record low ratings. Those who considered that the top rating was only around 50 were, it may be assumed, recording their judgement that there was no-one clearly to be rated highly on that criterion. Thus, the analytical judgements described above simply reflect the fact that, as far as respondents were concerned, the ratings had **meaning**; in effect these judgements are taking the subjects at their word and interpreting their ratings as meaningful statements.

9.2. CRITERION OF DIFFERENTIATION.

Having identified the top score in each row of the interpersonal matrix using the criteria above, a further criterion was applied. If the second to top score was within 10 points of the top score, in each row of the matrix, then it was considered that the person making the rating was, in effect, making only a very slight distinction between the two people to whom they had given the ratings. That is, if person A gave person B a rating of 98, person C a rating of 90, and everyone else a rating of 70, then it would seem to be reasonable to assume that he or she is indicating that there is very little difference between B and C, but a large difference between these two and everyone else. The ten points criterion is, of course, arbitrary in the same way as are the divisions of the sociometric scale.

9.3. SUMMARY OF THE PROCEDURE.

The steps in the procedure can be summarised very easily.

For each row of the matrix:

1) Identify the top score.
2) If this score is less than 55, move on to the next row.
3) If the score is greater than 55, identify the next highest score.
4) If the two scores are within 10 scale points, look for the third highest score. Otherwise move on to the next row.

For recording purposes, when a score was identified as top using the criteria above, it was entered into a new matrix as a 1. Scores which came within the 10 points of this score were recorded as a 2. It should also be noted that where a second score came

within 10 points of the top score, but was also within the neutral rating area (45 - 55), then it was excluded. The following hypothetical example illustrates the process.

Imagine that a group provides the following data:

	1	2	3	4	5
1	0	20	30	40	45
2	100	80	70	60	50
3	100	95	70	60	50
4	0	10	20	30	100
5	0	20	30	95	100
$\bar{X}$	40	45	44	57	69

Using the criteria described above, a second matrix, which we call the first-choice matrix, is constructed:

	1	2	3	4	5
1					
2	1				
3	1	2			
4					1
5				2	1
T(1)	2	0	0	0	1
T(1+)	2	1	0	1	1

This yields two sets of column totals, as shown. The first (T(1)) gives the totals based solely on top scores; the second (T(1+)) includes those scores which come within 10 points of the highest score in that row. It is these totals that were used as the basis

for the constructed sociograms. It will be noted that self ratings have been excluded from both column totals (see the total for group member 5). The reason for this, and the treatment of self ratings, is discussed in the next section.

9.4. CONSTRUCTING THE SOCIOGRAM.

Each person in a group is represented, conventionally enough, by a number within a circle. A choice from one group member to another is represented by an arrow indicating the direction of the choice (from who to whom). In this respect the sociograms that are constructed resemble, indeed are examples of, directed graphs (Harary & Norman, 1953; Knoke & Kuklinski, 1982).

Taking seriously Knoke and Kuklinski's point, quoted earlier, that there is a virtually limitless number of diagrams that could be drawn from any given set of data (Knoke & Kuklinski, 1982: 38), and bearing in mind that the sociograms were intended to show who, if anyone, came top on any particular scale, it was considered important to introduce some restriction on the scope of the diagrams. Instead of simply showing the pattern of choices within the data, it was considered important to try and give some indication of magnitude as well. Accordingly each sociogram has, on the left side, a numerical scale from 0 - (n - 1). Using this scale points were plotted according to the number of choices received, based on the column totals of the first choice matrix. An important feature of these sociograms, therefore, is that <u>the vertical scale is interpretable</u>; the distribution of the plots indicates <u>the extent</u> to which any given person is chosen within the group as <u>first choice</u> on the named sociometric criterion.

The horizontal distribution of the points, however, has no meaning, and in point of fact was mostly arranged according to convenience and clarity, that is, to reduce the number of crossing arrows (see Borgatta, 1951). Experiments using a second numerical scale along the bottom of the diagram (an ordinate) turned out to be fruitless; the resulting diagrams were messy and difficult to interpret.

In practice two sociograms were constructed for each sociometric scale, one based entirely on first choices only (the 1s in the first choice matrix) and one based on the first and close second choices (the 1s and 2s of the first choice matrix). First choices were indicated in both diagrams by a bold arrow; second choices were indicated by a dotted one. Mutual choices were indicated by a double arrow, comprising two bold arrows, two dotted ones, or one of each, depending on the nature of the choices made. These are demonstrated in figure 9.1 below.

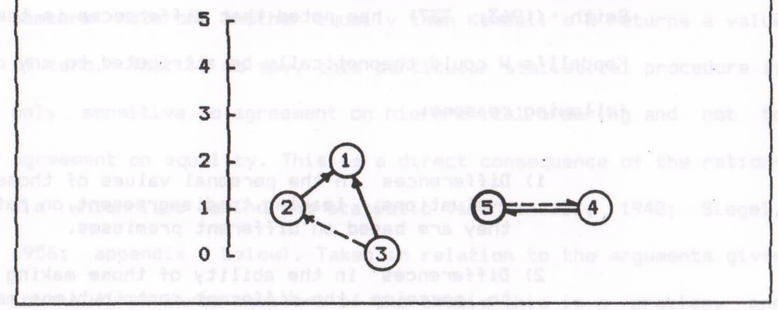
Self ratings were not included in the plotting of the points. That is, self ratings were excluded from the totals, and played no part in the position of the points within the sociogram. The reason is that people who are unduly modest or immodest in their self evaluations can frequently create distorting effects on the overall results (Jones, 1959; Reidesel, 1974). Besides this, however, given the theoretical formulations presented earlier in the thesis (chapters 3 & 4) self ratings are of less interest than those of the rest of the group. That is, we are here primarily interested only in the ratings that group members give to one another.

Nevertheless, in some ways self ratings present important information which should not be ignored. For example, a person who presents a high self evaluation, but remains unchosen by the rest of the group, is an interesting individual, someone, perhaps, whose social reality is at variance with the rest of the group. Such a person might well be an outsider, an overactive deviant, a scapegoat, for example. Accordingly, self evaluations were indicated on the circle surrounding the number of the point plotted on the diagrams. A first choice self rating is indicated by a bold outer circle, a second choice self rating indicated by a light outer circle.

It should also be noted that where an individual made a high self evaluation, and rated no other group member within 10 points of that self rating, then that person was considered to have made no choice within the group according to the specified criterion.

Applying all the considerations just discussed to the hypothetical data given earlier, the following sociogram results (figure 9.1).

Figure 9.1. SOCIOGRAM CONSTRUCTED FROM HYPOTHETICAL DATA.



It should be stressed that the sociogram in figure 9.1 is a **first-choice** sociogram. This means that **every** arrow within the diagram indicates that a choice for **top** on the named criterion has been made. Each person chosen, therefore, represents a departure from a purely hierarchical structure with a single person at the apex, and indicates some move towards a distributed structure. This will be made clearer when the results are discussed.

10. STATUS CONSENSUS.

It has been argued several times throughout the thesis that status consensus is an important concept. It is important in relation to the negotiated order arguments given earlier in the thesis (chapters 3 & 4) and in relation to the role differentiation hypothesis (Bales, 1958). Nevertheless, it is a difficult concept to operationalise. Bales, as noted previously, used Kendall's Coefficient of Concordance (Kendall's W) to measure consensus in his groups. The way in which he employed the measure, in relation to his task scales alone, has already been criticised in chapter 6. There are, however, more general considerations which need to be taken into account.

Smith (1963: 337) has noted that differences in the values of Kendall's W could theoretically be attributed to any or all of the following reasons:

1) Differences in the personal values of those making the evaluations, leading to disagreement on ratings because they are based on different premisses.

2) Differences in the ability of those making evaluations to perceive the different contributions made by other group members.

3) Differences in the degree to which various kinds of contributions are actually present in the group. For example, if everyone agrees that everyone contributed equally bad Ideas, then Kendall's W registers total lack of consensus (see appendix # below).

To these might be added the following:

4) The emergence of sub-groups, or cliques, each focussed on different people rated as top, and with different status orders for the entire group.

Point 4 is, of course, a specific extension of point 1.

If considered in relation to the theoretical formulation given in chapters 3 and 4, points 1, 3 and 4 suggest a failure to establish a shared understanding of social order. That is to say, low status consensus suggests not groups but aggregates (as these terms were defined in chapter 3). This further suggests that it makes little sense to examine groups with low status consensus for emergent structure because, by definition, there is little or no agreement within the group as to what it is. Certainly, low values of Kendall's W are typically interpreted as an indication that there is no agreement about who comes top.

Smith (1963) makes the further point, however, that if group members rate one another equally then Kendall's W returns a value of zero. That is to say, this particular statistical procedure is only sensitive to agreement on hierarchical ordering and not to agreement on equality. This is a direct consequence of the rationale which lies behind the statistic (see Kendall, 1948; Siegel, 1956; appendix J below). Taken in relation to the arguments given in the first three chapters of the thesis this is a problem, and it is for this reason that a complementary coefficient of concord-

ance sensitive to agreement on equality (called Sigma) was developed as part of the work for this thesis (appendix J).

Like Kendall's W, Sigma takes account of the entire rank ordering within the group. That is, both statistical procedures take account of each person's complete rank ordering of the members of the group in the calculation of the final value. Shelley (1960) argues, however, that this is neither necessary nor desirable if the object of study is whoever is top of the rank ordering within the group, as it is in role differentiation research. As he points out, the fact that group members disagree on who is third in the rank ordering is irrelevant, and yet it plays a significant part, perhaps even the most significant part in some cases, in the final value returned by Kendall's W and similar measures. Thus coefficients of this sort cannot be taken as measures of agreement on the person apparently rated top on any particular scale, let alone overall. In this sense it is not a measure of consensus. It is arguable, therefore, whether Kendall's W, or any similar measure, is adequate as a measure of status consensus at all.

Nevertheless, some measure of consensus is important. It is of little use to know who is top if there is no estimate of the extent to which they are top.

The sociometric literature contains several measures, or indices, which are intended to measure similar constructs. For example, group cohesion has been measured by the ratio of number of mutual choices to the total of possible mutual choices; group integration has been measured as the inverse of the number of isolates in the

group, and so on (Knoke & Kuklinski, 1982; Krech, Crutchfield & Ballachey, 1962; Proctor & Loomis, 1951). In similar vein, Hohn (1953), Katz (1953), and Landau (1951) have all developed different forms of "hierarchy index", or "index of concentration" (see Glanzer & Glaser, 1959). Bavelas (1950) and Leavitt (1951) both used a measure of "centrality of the actor" based on the ratio of the aggregate relations involving the individual over all relations in a network (Knoke & Kuklinski, 1982). These, unfortunately, are all focussed on special cases. Katz (1953), for example, concentrates exclusively on the binary matrix. Hohn (1953) developed his index in relation to matrices with weighted entries, and, moreover, used the entire rank ordering within the matrix as the basis for calculation, in much the same way as Kendall's W.

All of these measures are unduly complex for what is required here. Moreover, most seem to be measuring aspects of the data which don't quite capture what it is that we require. In simple terms, what is required is a simple measure of agreement that the person rated top is top. Accordingly, a different measure was developed based around the first-choice matrix discussed earlier. This we call the "index of focusedness".

First, if person A, who is a member of a five-member group, receives 4 choices within the first choice matrix, then he or she has received the maximum choice that was available. If, however, everyone else received the same number of choices, then the group is obviously far less focussed on person A than if everyone else had received no choices. Accordingly the first step in the calculation of the index of focusedness is to express the score of the

person receiving most choices as a proportion of all choices made:

$$1) \qquad r = \frac{n(1)}{T}$$

where **n(1)** is the number of choices received by the person receiving most choices, and **T** is the total number of choices made by all group members. This ensures that if person A receives all the choices made within the group, then r = 1.

As it stands, however, this is still not adequate for present purposes. If A receives 1 choice, and that was the only choice made within the group, then r = 1. But clearly, in this case the group could hardly be said to be focussed in any useful sense on person A. If person A receives only one choice, then she or he has, as a member of a five-person group, received only ¼ of the choices that she or he could have received. So, a second ratio needs to be calculated which takes account of the number of choices received by the person receiving most choices divided by the total number that she or he could have received:

$$2) \qquad s = \frac{n(1)}{n(max)}$$

where **n(max)** equals the number of choices that any one person in the group could have received (in the case of a five-member group n(max) = 4). As with the first ratio, if person A receives the maximum number of choices then s = 1.

To derive the index of focusedness, the two ratios can be multiplied. That is, the index is the product of r and s. If multiplied through, it gives the following equation:

$$3) \qquad f = \frac{n(1)^2}{T \times n(max)}$$

Thus, if person A receives 4 choices, and there were only four choices made in the group, then the index will be calculated by:

$$4) \qquad f = \frac{4^2}{4 \times 4} = 1$$

If, however, everyone in the group receives 4 choices, then:

$$5) \qquad f = \frac{4^2}{20 \times 4} = 0.2$$

If no-one receives any votes, then f = 0.

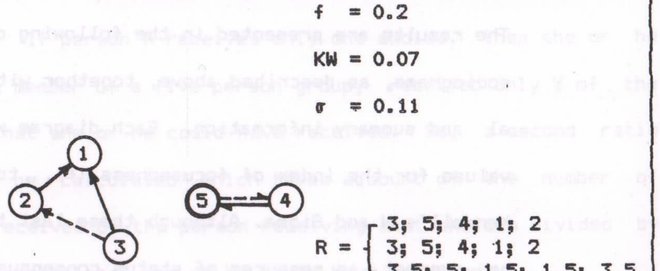
11. NOTE ABOUT THE PRESENTATION OF RESULTS.

The results are presented in the following chapters in the form of sociograms, as described above, together with attendant statistical and summary information. Each diagram will be accompanied by values for the index of focusedness (f), together with values for Kendall's W and Sigma. Although these last two have been argued to be suspect as measures of status consensus in terms of the one person, if any, who emerges as top on any particular sociometric scale, nevertheless it was felt that they could usefully be presented alongside the other information for comparison. Similarly, summary vectors for the interpersonal matrix calculated according to mean ratings, mean rankings, and mean deviations from the row mean are also included, for the same reason. Generally, none of this extra information will be commented on; it is purely for comparison with the structures derived from the procedures described above. By and large no comment is necessary to demonstrate that the sociograms present a more complex, and more dynamic view of group structures than any of the other summary measures, and

this mute comparison will reinforce the point made several times already, that **simple summaries are neither valid nor reliable summaries of emergent group stucture**. Commentaries on the results will focus on the description and interpretation of the structures which emerge from the sociogrammatic presentation in the light of the role differentiation hypothesis as understood empirically.

As an example of the presentation method, the hypothetical data presented earlier are reproduced below together with the other information.

Figure 9.2. **SOCIOGRAM CONSTRUCTED FROM HYPOTHETICAL DATA.**



12. SUMMARY OF THE RESEARCH PROGRAMME.

The studies conducted for this thesis will be presented in the following chapters in the following order (see also appendix B):

1) One-session laboratory groups using the WarwQ (groups 1 - 6).

2) One-session tutorial groups using the WarwQ (groups 7 & 8).

3) Multi-session tutorial groups using the WarwQ (groups 9 - 11).

4) One-session laboratory groups using the SGQ (groups 12 - 18).

CHAPTER 10: STUDY ONE - SINGLE SESSION GROUPS (Part One).

1. INTRODUCTION.

The groups examined in this study met for one session in a laboratory, and completed the WarwQ (see p 360, last chapter).

Since the WarwQ was based very closely on Bales' original studies, there are no questions relating to perceived activity level, and there are no extended questions relating to perceived social-emotional activity (e.g. Burke, 1972). Therefore, this study, and all of those involving the WarwQ, examines role differentiation in the simple empirical sense described by Bales (e.g. 1958). That is, for the purposes of this study role differentiation will be considered to have occurred if the person identified as the top on Ideas and (or) Guidance, should there be one, is not the best-Liked group member.

2. METHOD.

2.1. SUBJECTS.

38 subjects (Ss), 26 women and 12 men, were arranged into 6 mixed sex groups: 5 groups of 6 and 1 of 8 members. All participants were undergraduate psychology students fulfilling a course requi-

rement. Every effort was made to ensure that Ss did not know one another prior to the group sessions, but inevitably there were occasions where this requirement was not met.

2.2. TASK.

The apparatus consisted of the WarwQ (see appendix E), and a 1½ hour tape recording based on the transcript of a rape trial. The latter was supplied by Dr. Ian Morley of Warwick University.

Group sessions took place in the social psychology laboratory at Warwick University, which was equipped with 4 video cameras, a one-way mirror, and a circular table with chairs. Two microphones were placed centrally on the table, and armchairs were placed around the periphery of the room.

Each group was told to consider itself as the jury convened for the trial of two alleged rapists; Bryce and Harrison. They were to listen to the trial (the tape recording), and then to consider the evidence presented and arrive at a verdict for each of the two defendants: guilty of rape; guilty of attempted rape; not guilty.

At the end of the discussion session, when they had reached their verdict, all participants were asked to complete the WarwQ.

2.3. PROCEDURE.

Once all the members of a group had assembled in the laboratory, the purpose of the study was briefly explained to them. Participants were told that we were interested in the dynamics of small

groups, although they were not told in detail which aspects were of most interest. They were assured that they were not being deceived, and that there were no hidden purposes which were being kept from them. It was further explained that full details could not be given because this might distort the interactions of the group.

The nature of the task was then explained, and participants were asked if they understood, or had any further questions. All questions not relating to the purpose of the study were answered freely. Group members were then given a guided tour of the laboratory. Microphones, video cameras and the one-way mirror were all pointed out, and their purpose explained. Participants were also shown the control room, and it was explained to them what the researcher (R) would be doing during the group session.

Participants were then asked again if they understood the task, and if, in the circumstances they were prepared to continue. In no case did any participant express reservations.

All participants having agreed that they understood what they were to do, were asked to seat themselves where they felt most comfortable. The tape recording was switched on, and R left the room.

When the tape had finished, participants were given 15 minutes break for coffee, which was essential since a full session lasted in the region of three hours. Following coffee, participants were asked to arrange themselves around the circular table, and discuss the evidence that they had heard. It was stressed that this was a

jury simulation exercise, and that they were therefore expected to reach a consensus verdict for each of the two defendents. Queries were once again invited, and when these had been answered R once again left the room. The group discussion was allowed to continue for 45 minutes, and was recorded audio-visually.

After 45 minutes, R re-entered the room and asked if a verdict had been reached. Participants were then each given a copy of the WarwQ, which they were asked to complete.

The questionnaires were distributed very carefully. It was felt that if they had been numbered overtly, then the numbers themselves might have affected the responses. Therefore each participant was asked to consider him or herself as group member number one, and to record their responses with respect to the other members by numbering them in a clockwise direction. This is best explained with reference to the instructions on the cover of the questionnaire (see appendix E and appendix G). For the purposes of collating the data, the group member who appeared in at the left of the upper monitor screen (there were two) was tagged by R as S1. The questionnaires, which were prepared during the group discussion, were covertly numbered using the following simple code: 1: -; 2: X; 3: ^; and so on, in each case the number of lines making up the code character corresponding with the number assigned to the group member. They were distributed as casually as possible, but in strict order, rotating in a clockwise direction to ensure that numbers assigned to group members corresponded with their position around the table.

Once the questionnaires were distributed, participants were told that they could, if they wished, leave the central table and seat themselves in the easy chairs. It was stressed, however, that they should arrange themselves strictly in the same relative order as they had had around the table. R remained in the room to answer queries, and make more coffee. Participants were invited, indeed encouraged, to add pertinent comments to the questionnaires if they felt moved to do so.

3. RESULTS.

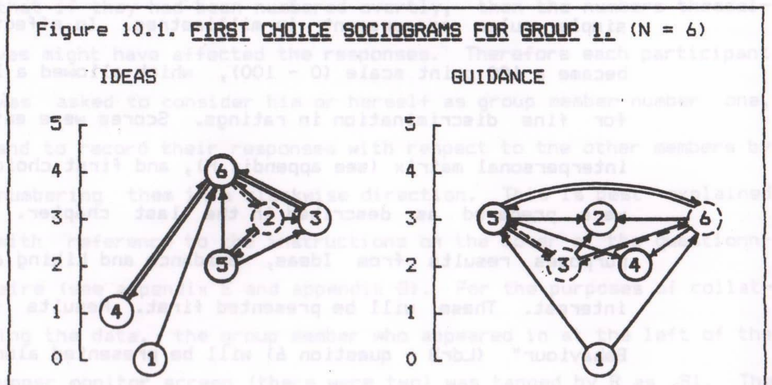
Scores from the uncalibrated ratings scales were derived using a simple ruler measurement in millimetres. In effect the scale became a 100 point scale (0 - 100), which allowed a lot of scope for fine discrimination in ratings. Scores were entered on an interpersonal matrix (see appendix H), and first choice sociograms were prepared as described in the last chapter. For present purposes results from Ideas, Guidance and Liking are of most interest. These will be presented first. Results from "Leader Behaviour" (LdrB - question 6) will be presented alongside as an estimate of overall status structure. The results are presented systematically group by group.

3.1. GROUP 1.

The first results to be considered here are those for Ideas and Guidance (Bales' task scales) for group 1. These are reproduced as figure 10.1 below.

The first thing to note is that member 6 seems to be fairly well established in this group as far as Ideas is concerned. Quite clearly this person is seen by the rest of the group as having contributed the most Ideas to the discussion, having been chosen top by 4 out of 5 of the other group members. The only exception is member number 5, who nevertheless selects 6 as second choice. Note, however, that the choice is not an absolutely clear one. It must be emphasised once again that these sociograms are <u>first choice</u> sociograms, and <u>every</u> arrow within them is a choice for number 1. In other words, each choice diminishes the purely hierarchical nature of the derived structure.

Figure 10.1. <u>FIRST CHOICE SOCIOGRAMS FOR GROUP 1.</u> (N = 6)



f = .36; W = .55; σ = .33 f = .14; W = .59; σ = .45

$$R = \begin{bmatrix} 6;\ 3;\ 2;\ 5;\ 4;\ 1 \\ 6;\ 3;\ 2;\ 5;\ 4;\ 1 \\ 6;\ 3;\ 2;\ 5;\ 4;\ 1 \end{bmatrix} \qquad R = \begin{bmatrix} 6;\ 1;\ 4;\ 5;\ 3;\ 2 \\ 6;\ 1;\ 4;\ 5;\ 3;\ 2 \\ 6;\ 3;\ 4;\ 5;\ 2;\ 1 \end{bmatrix}$$

In this case, persons 2, 3, and 5 have aslo been selected as top by at least two other members. 6, however, was selected by 4 members (that is two thirds of the membership), so it is 6 who appears as most chosen on Ideas. Therefore, although it is clear that number 6 is top on Ideas, nevertheless there is a certain

amount of distribution in the structure, reflected in the value of the index of focusedness (f = 0.357). This distribution is caused partly, it might be noted by the fact that number 6 also chooses three other members (2, 3, and 4).

By Bales' criterion (see chapter 5), this group would be considered as a high SC group, at least with respect to Ideas, since Kendall's W' (corrected for excluded main diagonal) gives a value of 0.55.

The picture is not so clear cut in relation to Guidance, however. Although by Bales' criterion these results also suggest that the group is High SC (Kendall's W' = 0.59), nevertheless there is no member who is clearly top (f = 0.2). On the contrary, the structure is highly distributed amongst five of the group members. It is not, however, totally distributed; the cluster of members at the top of the diagram shows only 3, out of a possible 10, mutual choices.

If first choices (the bold arrows) only are taken into account, then number 6 once again comes top, but it is hardly to be claimed that it is a clear cut choice. Interestingly, the summary vectors recorded on the sociogram for Guidance would have suggested a similar conclusion, but for a different group member. If these are examined it will be seen that the summary vectors calculated from mean <u>ratings</u> (top row) and mean <u>rankings</u> (middle row) indicate that number 2 comes top on the scale, and number 6 comes second. The summary vector based on mean <u>deviations</u> from the row mean, however, places number 6 first, and number 2 third. Number 5, in

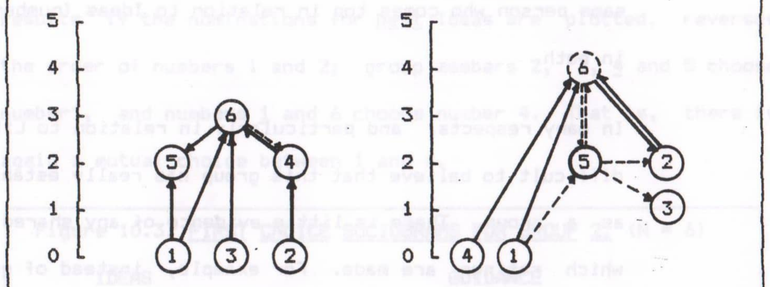
this case, comes second. So the different summaries juggle, so to speak, those who come in the top three places. It is interesting to note that the three group members who swap top places are the same three who are placed at the top of the sociogram.

Of some interest, in relation to these diagrams, is the fact that 1 consistently receives low scores from all the other group members, except number 3, on both Ideas and Guidance. Number 4, who appears quite high in the diagram for Guidance, receives low scores (less than 45) from 2 and 5.

Overall, these two diagrams suggest that 6 is the Ideas person of the group, but is not the sole discussion Guide. This is consistent with Bales' suggestion that Guidance is a very generalised task function (e.g. Bales, 1958), although, of course, it is doubtful whether he meant it in terms of the numbers who performed it. The low ratings received by number 1 may be evidence of scapegoating taking place.

When the sociogram for Liking is considered, apparently number 6 comes top again. In this case, therefore, role differentiation has not occurred. Looking at the diagram more closely, however, it will be seen that, in some ways, the initial impression is misleading. It is true that number 6 receives most votes, but again it is not clear cut (f = 0.28). Moreover, when the raw scores are examined, the inescapeable conclusion is that number 6 comes top almost by default. The fact of the matter is that this group demonstrates very little interpersonal attraction.

Figure 10.2. FIRST CHOICE SOCIOGRAMS FOR GROUP 1. (N = 6)



Generally scores are low or middling (average score = 45.33); the highest score given is 67, but most are less than 60. Number 1 is most definitely a low status member, receiving an average Liking score of 27.8, with a range of 11 - 40.

Turning finally to the structure derived from the leader behaviour question, which can be interpreted as a rating of general leader status within the group, here we see that once again it is number 6 who comes top. In this case consensus (as measured by the index of focusedness) is higher than it is for any of the other scales except Ideas (f = 0.356), with which diagram it bears a strong resemblance.

Generally speaking, this group shows no evidence of role differentiation. One person (number 6) seems to emerge as top in relation to Ideas and perceived leader status, but in both cases the

choice is not absolutely clear cut. There is no one person who emerges as top in relation to Liking or Guidance, although the same person who comes top in relation to Ideas (number 6) is high in both.

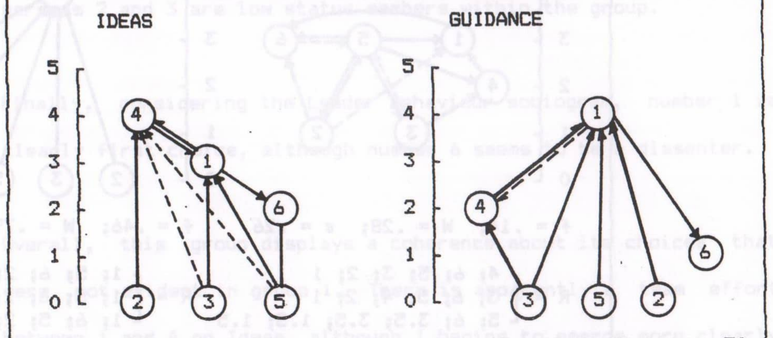
In many respects, and particularly in relation to Liking, it is difficult to believe that this group has really established itself as a group. There is little evidence of any shared basis upon which ratings are made. For example, instead of group members choosing one or more of their fellow group members as high on the different criteria, there is a tendency for "chains" to form. Instead of, for example, persons A and B choosing persons C and D, there is a tendency for person A to choose B; B to choose C; C to choose D, and so on. There is, in short, less coherence in the choices than initially appears, and this suggests that they are made on the basis of different premisses (compare the comments about Kendall's W made by Smith, 1963). In the terms introduced in chapters 3 and 4 above, this group has yet to establish a clear shared sense of social order.

3.2. GROUP 2.

In contrast with group 1, the ratings given by group 2 are much more coherent. It will be seen, for example, that although with respect to Ideas, person 4 is, to some extent, accompanied by group member number 1, nevertheless there is some convergence in the way that the way that the group has made its choices. In point of fact, the diagram for Ideas would suggest that numbers 4 and 1 are working together as some sort of team. This is reinforced to some extent if the first choices only are considered (the bold

arrows), where, it will be seen, the only mutual choice in the diagram is between these two. Interestingly, the diagram that results if the nominations for best Ideas are plotted, reverses the order of numbers 1 and 2; group members 2, 3, 4 and 5 choose number1, and numbers 1 and 6 choose number 4. That is, there is again a mutual choice between 1 and 4.

Figure 10.3. FIRST CHOICE SOCIOGRAMS FOR GROUP 2. (N = 6)



f = .36; W = .71; σ = .45 f = .48; W = .48; σ = .30

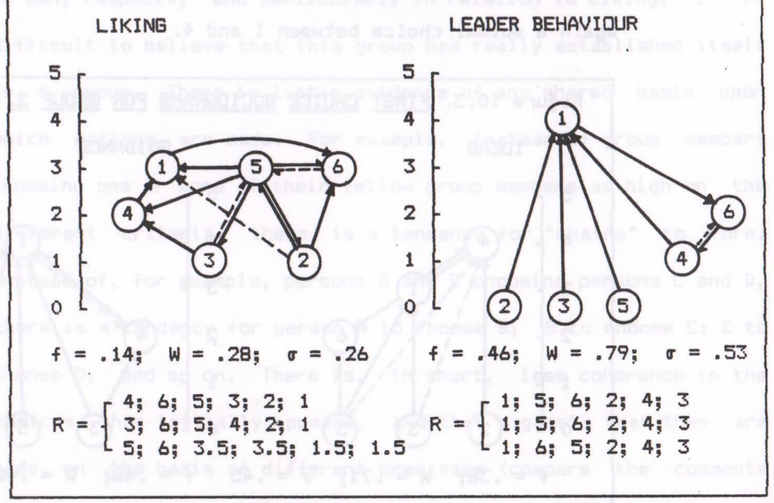
$$R = \begin{bmatrix} 3; & 5; & 6; & 1; & 4; & 2 \\ 2; & 5; & 6; & 1; & 4; & 3 \\ 2; & 5; & 6; & 1; & 4; & 3 \end{bmatrix} \qquad R = \begin{bmatrix} 1; & 4; & 6; & 2; & 5; & 3 \\ 1; & 4; & 6; & 2; & 5; & 3 \\ 1; & 4; & 6; & 2; & 5; & 3 \end{bmatrix}$$

The sociogram for Guidance also reinforces this impression. Here, as it will be seen, number 1 receives most choices (4), with number 4 coming second (with 2 choices).

In contrast to the Ideas and Guidance sociograms, that for Liking is very much more distributed, and much less coherent. It can be seen that number 4 is clearly not best-Liked in the group, although number 1 is among those rated highest. The apparent integration of the diagram is primarily a function of the choices made by group member 5, who appears to be playing the part of an integra-

tor of some kind. If the choices made by person 5 are removed from the diagram, then the coherence vanishes, and the diagram begins to take on the appearance of a chain.

Figure 10.4. FIRST CHOICE SOCIOGRAMS FOR GROUP 2. (N = 6)



If this diagram is compared to the Ideas and Guidance diagrams, it will be seen that person 5 receives no choices in relation to Ideas and Guidance, but is clearly a popular individual within the group. Similarly, person 6 receives little choice on Ideas and Guidance, but is clearly also very popular. Number 1 is the group member who was chosen top on Guidance, so the high popularity rating is in itself interesting. It will be recalled that Slater (1955) suggested that Liking was closely related to Guidance (see chapter 5), and this result seems to provide some corroboration.

There are some tensions detectable within the group, however. Although ratings on Liking tend to be overall high (mean rating overall = 63.75), 3 does not appear to Like number 1 very much,

giving a rating of only 44 in contrast to the 78 given to all other members. Moreover, number 4 seems to be fairly indifferent to the rest of the group, giving no-one a rating above 56, and giving number 2 a rating of 3 points. In contrast, 5 seems to Like everyone, giving a uniform rating of 78, and so does 6 who gave ratings of between 61 and 99, although it is interesting to note that the lowest score was given to number 1. It is clear also that persons 2 and 3 are low status members within the group.

Finally, considering the Leader Behaviour sociogram, number 1 is clearly first choice, although number 6 seems to be a dissenter.

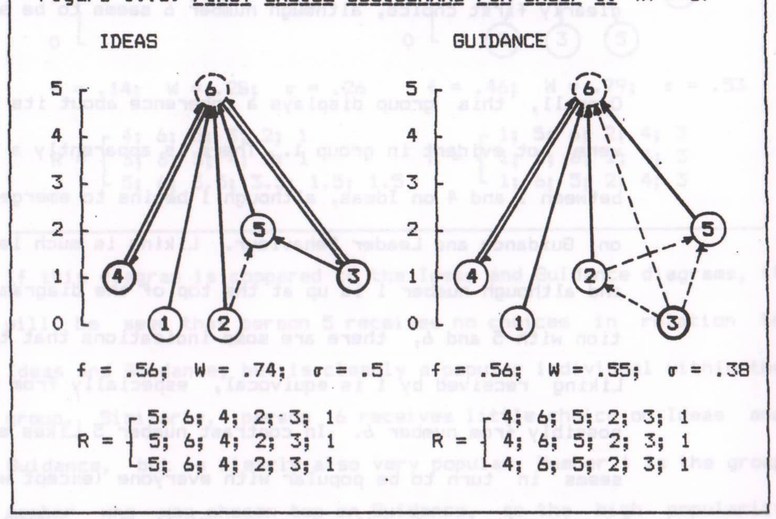
Overall, this group displays a coherence about its choices that were not evident in group 1. There is apparently a team effort between 1 and 4 on Ideas, although 1 begins to emerge more clearly on Guidance and Leader Behaviour. Liking is much less clear cut, and although number 1 is up at the top of the diagram, in conjunction with 5 and 6, there are some indications that the degree of Liking received by 1 is equivocal, especially from number 3 and possibly from number 6. In contrast number 5 Likes everyone, and seems in turn to be popular with everyone (except with number 4 who doesn't seem to Like anyone). Similarly, notwithstanding the hint of ambivalence about number 1, number 6 seems generally to Like everyone, and to be in turn popular.

This is an interesting group, and it seems possible, making due allowance for the use of Liking as the only social-emotional scale, that what has emerged here is something that could reason-

ably be described as double role differentiation. That is dual task specialists working in tandem, and dual social-emotional specialists also working in tandem. The links between these two "teams", if that is what they are, seems to be through the regard that 1 has for 6 (even if not reciprocated) and the regard that 6 has for 4 (also not reciprocated). In this case it is regrettable that some of the data that would have been available through the SGQ is not available for this group.

3.3. GROUP 3.

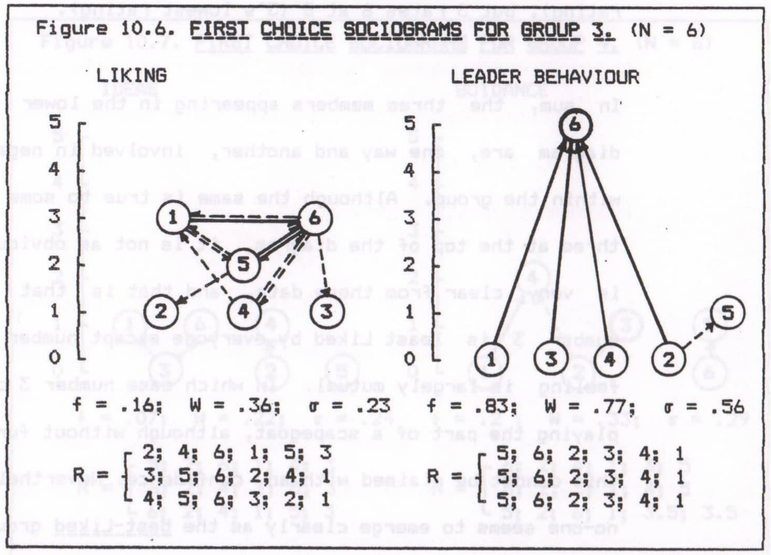
Figure 10.5. FIRST CHOICE SOCIOGRAMS FOR GROUP 3. (N = 6)



Group 3 is the first truly focussed group to be considered so far. There is no doubt whatsoever that number 6 is top both with respect to Ideas and Guidance (f = 0.56 in both cases). Indeed both diagrams bear a strong resemblance to one another overall. There is, for example, the same curious grouping involving members 2, 3, and 5 in both.

The picture, once again is not as clearly focussed in the diagram for Liking (figure 10.6 below). In this sociogram it will be seen that whilst 6 is still rated top, nevertheless the differentiation is not as obvious as it is in the Ideas and Guidance sociograms. Number 6 is joint top with number 1, and to some extent they are joined by number 5. Number 1 received no first or second ratings for either Ideas or Guidance, whilst number 5 received some first ratings although not very many. It is interesting to note that these three members (1, 5, & 6), are involved in a triangle of mutual choices, which suggests a clique within the overall group.

Figure 10.6. FIRST CHOICE SOCIOGRAMS FOR GROUP 3. (N = 6)



Members 2, 4, and 3, although each receiving one choice (either from 5 or 6) appear, on the face of it to be outside the core of the group, and are to some extent peripheral. This impression is reinforced through a consideration of the raw scores.

Group member 1 gives generally low ratings to everyone, and in particular number 3 (rating = 5). Member 4 gives ratings of less than 41 to numbers 2, 3, and 5 (compare the member clusters in the diagrams for Ideas and Guidance). Number 5 gives high ratings to everyone (ratings all greater than 90) except to number 3 (rating = 18), who reciprocates the disregard (rating = 14). Member 6 gives ratings greater than 64 to everyone except to number 2 (rating = 47). In addition, numbers 2 and 4 give each other low ratings (less than 49 in each case) and there are two sets of unreciprocated Liking: 3 rates 4 at 63 (3's highest rating) but 4 rates 3 at 24 (4's lowest rating); 6 rates 3 at 76 (second highest rating), but 3 rates 6 at 8 (3's lowest rating).

In sum, the three members appearing in the lower half of the diagram are, one way and another, involved in negative tensions within the group. Although the same is true to some extent of the three at the top of the diagram, it is not as obvious. One thing is very clear from these data, and that is that group member number 3 is least Liked by everyone except number 6, and the feeling is largely mutual. In which case number 3 could well be playing the part of a scapegoat, although without further evidence this cannot be claimed with any confidence. Nevertheless, although no-one seems to emerge clearly as the best-Liked group member, the least-Liked group member is without doubt number 3.

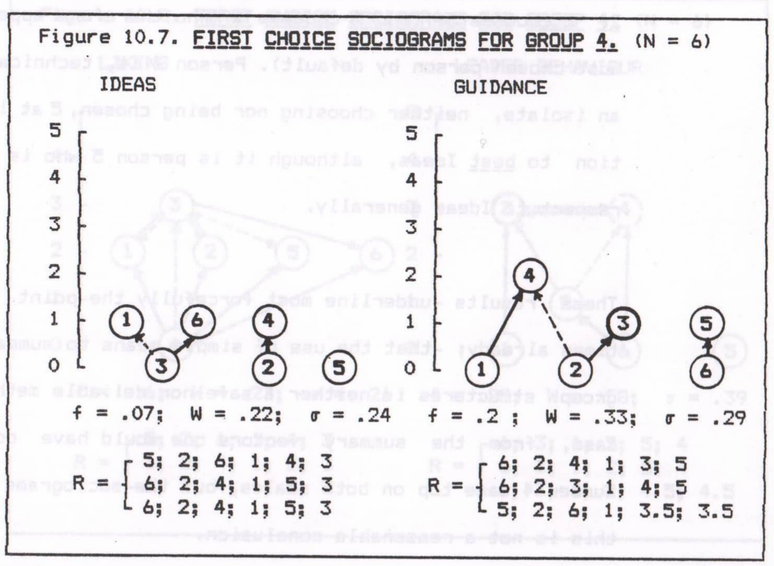
Notwithstanding the tensions within the group, however, there is near unanimity amongst the members about who is top in respect of Leader Behaviour (f = 0.83). All agree that number 6 is top, although 2 makes a close second choice for number 5. Perhaps this

is further evidence, albeit very indirect, that number 3 is acting as scapegoat, draining away the negative affect from person 6 (Bales, 1958; Burke, 1969).

Overall, this group is fairly closely focussed around person 6, although, as in the other groups examined so far, Liking seems to be distributed amongst several members with no one person emerging clearly as best-Liked. This lack of focus in terms of Liking seems to be emerging as a general feature in these groups.

3.4. GROUP 4.

Figure 10.7. FIRST CHOICE SOCIOGRAMS FOR GROUP 4. (N = 6)



The sociograms for group 4 on Ideas and Guidance are remarkable for their total lack of integration. This is a group that has clearly not progressed much beyond the state of an aggregate (see chapter 3). In relation to neither Ideas nor Guidance is there a great deal of sense in discussing an emergent structure, because,

to put it bluntly, there isn't one. In no sense can any single individual within this group be said to have emerged as top on either scale.

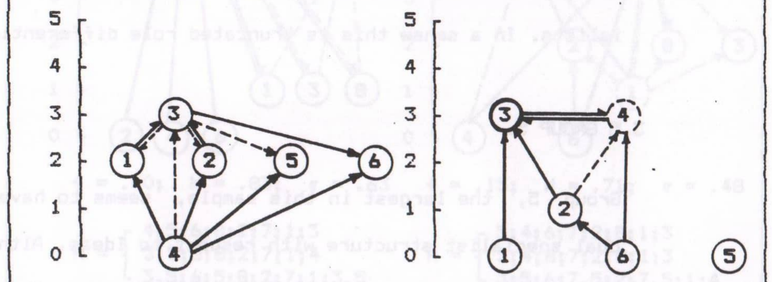
The lack of coherence in this group is further reinforced by an examination of the nominations for best-Ideas. In all groups considered so far, these nominations have largely corresponded with first choices on Ideas. In this group, however, not only is there little correspondence between first choices (there are only three of these) and nominations for best Ideas, but the latter forms an almost perfect chain: 1 chooses 3; 3 chooses 6; 6 chooses 2; 2 chooses 5; and 5 chooses 6 (who therefore appears to be the most chosen person by default). Person 4 is, technically speaking, an isolate, neither choosing nor being chosen, at least in relation to best Ideas, although it is person 5 who is isolated with respect to Ideas generally.

These results underline most forcefully the point made several times already; that the use of simple means to summarise emergent group structures is neither a safe nor reliable method. In this case, from the summary vectors one would have concluded that number 4 came top on both scales, but the sociograms indicate that this is not a reasonable conclusion.

In contrast to the other groups examined in this chapter (and in contrast with the sociograms for Ideas and Guidance), group 4 seems to have developed a structure in relation to Liking, rather than Ideas and Guidance. Here it can be seen that 3 emerges as the

strongest candidate for top rating. Even so, it is not unanimous; numbers 5 and 6, for example, choose no-one, and, except for the choices that 3 gives and receives, and those that 4 gives, the general level of ratings is low, averaging only 49. In point of fact the sociogram for Liking only achieves any coherence at all because of the choice pattern of numbers 3 and 4; number 4 chooses everyone, while 3 chooses everyone except number 4 (giving a low rating of only 48), so there is some tension there. These two, nevertheless, seem to be jointly holding the group together, a fact which seems to be reflected in the choice pattern for Leader Behaviour.

Figure 10.8. FIRST CHOICE SOCIOGRAMS FOR GROUP 4. (N = 6)



R = { 5; 2; 6; 1; 4; 3 / 6; 2; 4; 1; 5; 3 / 6; 2; 4; 1; 5; 3 }

R = { 6; 3; 1; 2; 5; 4 / 6; 3; 1; 2; 5; 4 / 6; 3; 1; 2; 4.5; 4.5 }

For Leader Behaviour, it is 3 and 4 who jointly occupy top place. In this case, notwithstanding 3's apparent lack of Liking for 4, there is a mutual choice between them. Number 5 appears to be isolated, neither choosing nor being chosen, a pattern consistent with the choice pattern on Ideas.

This is a curious group, overall. It seems to have developed no coherent structure with relation to task contributions (Ideas and Guidance), but has developed some structure with relation to Liking and Leader Behaviour. Whatever the basis for the ratings on Leader Behaviour, therefore, it is not in terms of contribution to the task. Assuming that the Liking given and received is to some extent a function of group activities (and not, for example, primarily based on extra-group factors such as physical attractiveness), the most likely explanation for this group's emergent structure is that the group has failed to establish a social order with respect to the task, but has concentrated on social-emotional factors instead. That is, group 4 appears to have no task specialists, but has developed at least one, possibly two, social specialists. In a sense this is truncated role differentiation.

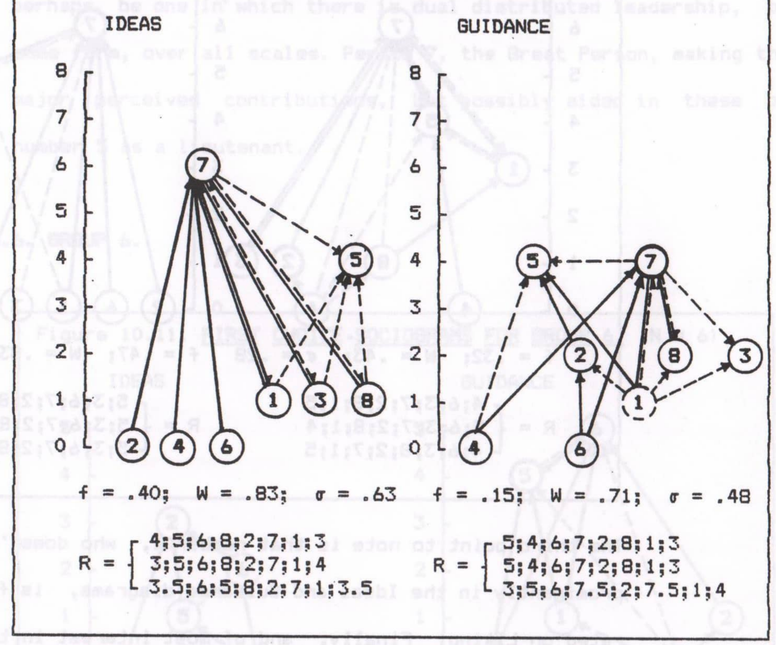
3.5 GROUP 5.

Group 5, the largest in this sample, seems to have developed a dual specialist structure with respect to Ideas. Although number 7 is clearly the group's choice, there is nevertheless a small collection of people clustering around number 5, including number 7. This choice is not reciprocated, and could, therefore indicate rivalry within the group for top place. On the other hand it could also indicate a form of dual, distributed specialisation.

The sociogram for Guidance doesn't resolve the question of joint specialisation, or rivalry, but it makes plain the fact that for this group it is persons 5 and 7 who are considered top in relation to task activity. The structure in this case is more diffuse

than Ideas, suggesting once again that Guidance is a more distributed, and generalised task function than Ideas. Once again person 7 makes an unreciprocated choice of number 5. Nevrtheless, by and large the structure appears to be well integrated, with few, if any, discontinuities within the group.

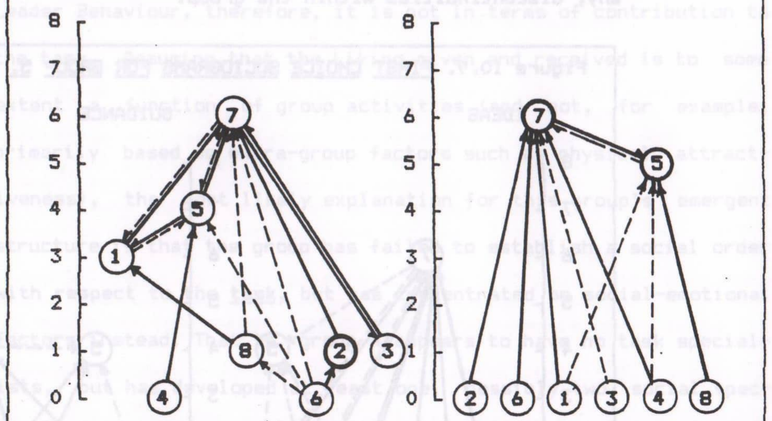
Figure 10.9. FIRST CHOICE SOCIOGRAMS FOR GROUP 5. (N = 8)



The Liking sociogram is revealing. First number 7 is clearly the group's choice as best-Liked person, thus making this a Great Person group (see chapters 2 and 5). Second, number 5 is high up in the group's choices, and in fact appears to acting as a sort of link between two groupings (6,2,7 and 8,1,7), as well as integrating number 4, who would otherwise be an isolate. Technically speaking, number 5 represents a "cut-point" in the diagram, that is, if 5's given and received choices were removed from the diag-

ram, then there would result, in graph theory terms, a disconected graph (Harary & Norman, 1953; Knoke & Kuklinski, 1982).

Figure 10.10. FIRST CHOICE SOCIOGRAMS FOR GROUP 5. (N = 8)



The third point to note is that number 1, who doesn't figure very prominently in the Ideas and Guidance diagrams, is fairly highly rated on Liking. Finally, and of most interest in the context of the relationship between 5 and 7 mentioned earlier, they choose each other, thus suggesting that there is co-operation rather than rivalry between them. At least there appears to be no enmity, and therefore what rivalry there may be is not destructive.

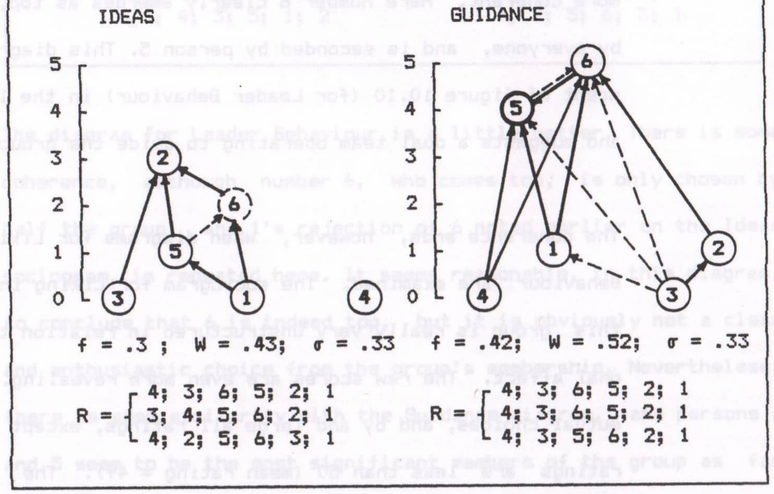
The Leader Behaviour diagram is perhaps the most interesting of all. Again number 7 is top choice, but closely followed by number 5. The mutual choice between them, albeit a second choice by

number 5 (who makes a self choice for top rating), indicates once more that the relationship is perhaps a co-operative one.

Overall, this group takes on the appearance of a Great Person group, but the situation is not altogether one which this description is adequate to cover. A better description would perhaps be one in which there is dual distributed leadership, of some form, over all scales. Person 7, the Great Person, making the major perceived contributions, but possibly aided in these by number 5 as a lieutenant.

3.6. GROUP 6.

Figure 10.11. FIRST CHOICE SOCIOGRAMS FOR GROUP 6. (N = 6)



The Ideas sociogram for group 5 seems to suggest that person 2 comes top, with 6 a close second. But a closer examination reveals that, in point of fact, there is little agreement within the group

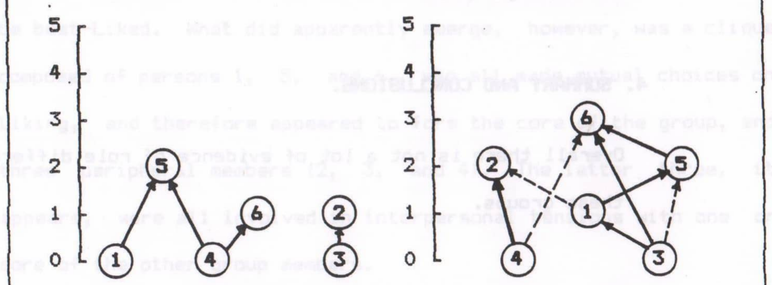
to this effect. The diagram is principally a function of the choices made by just three of the group's members (3, 5, and 6). Person 1, at least, clearly does not share these group members' perception that 2 contributed the most, or the best Ideas, selecting instead numbers 5 and 6. The scores that underlie this diagram are, for the most part very low (overall mean rating = 44.73). 2 rates 4 at only 5; 2 and 1 mutually reject one another (rating in both cases = 10); person 4, who is an isolate, rates person 3 at only 3. Overall, it is difficult to conclude that 2 has emerged as Ideas specialist, because the group itself seems not to have settled to any particular structure, and there are clear tensions in the group in this respect.

The diagram for Guidance is, in many ways, quite different, and more coherent. Here number 6 clearly emerges as top, being chosen by everyone, and is seconded by person 5. This diagram is reminiscent of figure 10.10 (for Leader Behaviour) in the last section, and suggests a dual team operating to guide the group discussion.

The coherence ends, however, when diagrams for Liking and Leader Behaviour are examined. The sociogram for Liking indicates that this group is really very unstructured in relation to interpersonal affect. The raw scores are even more revealing. There are no mutual choices, and by and large all ratings, except those for top ratings are less than 50 (mean rating = 49). The top ratings, those shown on the diagram, are all greater than 90, except the one from 1 to 5 (rating = 66). This demonstrates that there are strong feelings of Liking for those chosen top, but not for anyone else. Moreover, as can be seen on the diagram, there is no coher-

ent form to the pattern of who is best-Liked within the group, because there is a tendency to chaining. It is difficult to know quite how this diagram should be interpreted.

Figure 10.12. FIRST CHOICE SOCIOGRAMS FOR GROUP 6. (N = 6)



f = .14; W = .22; σ = .16 f = .16; W = .63; σ = .39

R = [6; 3; 5; 4; 1; 2 / 6; 3; 5; 4; 1; 2 / 6; 4; 3; 5; 1; 2]

R = [4; 2; 6; 5; 3; 1 / 4; 2; 5; 6; 3; 1 / 4; 2; 5; 6; 3; 1]

The diagram for Leader Behaviour is a little better. There is some coherence, although number 6, who comes top, is only chosen by half the group, and 1's rejection of 6 noted earlier on the Ideas sociogram, is repeated here. It seems reasonable, in this diagram, to conclude that 6 is indeed top, but it is obviously not a clear and enthusiastic choice from the group's membership. Nevertheless, there is some similarity with the Guidance diagram, and persons 6 and 5 seem to be the most significant members of the group as far as most of the scales are concerned.

Overall it is difficult to interpret the structure of this group. Person 6 is seen clearly as discussion guide, perhaps with number

5 as a lieutenant. The structure for Ideas, however, seems to be very weak, and the Liking structure is fractured and disconnected. Overall Leader Behaviour ratings seem to reflect those for Guidance, but in a much less clear cut way. It doesn't seem unreasonable to suggest that this group has, strictly speaking, failed to become a group in the full sense of the word.

4. SUMMARY AND CONCLUSIONS.

Overall there is not a lot of evidence of role differentiation in these groups.

In group 1, there emerged no clear structures with respect to Ideas, Guidance, Liking or Leader Behaviour. Although one member (number 6) was chosen most on Ideas, Guidance and Leader behaviour, and joint top on Liking (thus suggesting a Great Person group), in each case the structures were weak, and lacking integration (in terms of patterns and strengths of choice).

Group 2 had one significant individual (number 1) who emerged as most chosen on Ideas, Guidance and Leader Behaviour. On Ideas and Guidance there also emerged a second individual (number 4), less chosen than number 1, but apparently acting as a sort of deputy. The structure for Liking yielded no-one who was clearly best-Liked, although number 1 was joint top with two others (5 and 6). It is possible that this group had developed a double role differentiation; two task specialists (1 and 4) and two social-emotional specialists (5 & 6), although without further evidence this conclusion cannot be accepted without reservations.

Group 3 also had one significant individual emerge (number 6) with respect to Ideas, Guidance and Leader Behaviour. In each case the group was very clearly focussed on this particular member. Liking was less clear cut. Although 6 was joint top with person 1, and to some extent with person 5, which suggests a form of Great Person group, nevertheless there was no-one person who could be said to be best-Liked. What did apparently emerge, however, was a clique composed of persons 1, 5, and 6, who all made mutual choices on Liking, and therefore appeared to form the core of the group, and three peripheral members (2, 3, and 4). The latter three, it appears, were all involved in interpersonal tensions with one or more of the other group members.

Group 4 was not a group. No clear structures emerged in relation to Ideas and Guidance, and only weak structures emerged in relation to Liking and Leader Behaviour.

Group 5, which was the largest of the sample, developed a Great Person structure, with one individual (number 7) emerging as the most chosen person on all scales, including Liking. Interestingly, however, there was a second person (number 5), less highly chosen than number 7, but nevertheless appearing as a significant individual within the group. Overall, it appears that this group developed a form of dual distributed leader structure, with person 7 as the Great Perosn, and person 5 acting as a deputy.

Finally, group 6 developed only weak structures in relation to Ideas and Leader Behaviour, and had a semi-coherent Liking

structure, which tended towards a chain. The Guidance structure, on the other hand, seemed to have more clarity, with two persons emerging as discussion guides (6 and 5). In this case the structure bore some resemblance to that for Leader Behaviour in group 5, although the rest of the structures lacked coherence and integration. This was a difficult group to interpret, although by and large it seems reasonable to conclude that it never fully made the transition from an aggregate state.

In sum, there was only one example of role differentiation, and this did not follow the "classic form" of one person top on Ideas and Guidance, and another one top on Liking. There seemed, instead, to be two teams of "specialists", each diadic. Thus this group (group 2) displayed a sort of double role differentiation, displaying as well as role differentiation in Bales' sense, also a form of distributed leadership (Gibb, 1969).

The rest of the groups either seemed to develop into different forms of the Great Person group, or failed to make the transition to a group at all. This, it will be noted, rather undermines the comments of Verba (1961), who seemed to suggest that role differentiation would occur in precisely these sorts of groups, that is laboratory groups composed of undergraduates. It also tends to suggest that role differentiation is not very widespread, although with such a small sample this conclusion can hardly be pushed too far.

One thing that did emerge, and which is very important, is the fact that in only one group was there a Liking structure such that

any particular individual could be identified as best-Liked. The norm seems to be that Liking structures are either distributed, or lack coherence. In terms of role differentiation research using Bales' empirical definition, it is clear that if a best-Liked person cannot be identified, then strictly speaking neither can role differentiation.

CHAPTER 11: STUDY TWO - SINGLE SESSION GROUPS (Part Two).

1. INTRODUCTION.

Only two groups were examined in this study, both being tutorial groups (see chapter 9) from whom data were gathered for just one session. Strictly speaking these groups were not one-session groups, because they met regularly throughout the academic year. Moreover, they had been meeting for some time before the data were gathered, partly as a consequence of the procedure required by the university ethical committee on human experimentation (see appendices C & D). This, of course, means that they fail to meet one of the criteria for a fair test of Bales' role differentiation hypothesis (see chapter 8, section 2). Nevertheless, it was considered reasonable to include them here for two reasons. First, in view of the fact that they had been meeting for some time prior to data gathering, both groups should have had time to develop structures of some kind, and such structure as there was could be examined for evidence of role differentiation. Second, this study constituted a pilot for the procedure which was subsequently adopted for other tutorial groups.

Like the groups in study 1, these groups were asked to complete the WarwQ, so that role differentiation here will once again be

examined in terms of Ideas, Guidance and Liking.

2. METHOD.

2.1. SUBJECTS.

8 subjects (Ss), 4 women and 4 men, were arranged into 2 mixed sex groups, both of four members, and each comprising two men and two women. Participants were undergraduate management students meeting as tutorial groups as part of a course in the "Fundamentals of Social Science". They were all volunteers (see appendices C & D).

2.2. TASK.

The apparatus consisted of the WarwQ (see appendix E). Group sessions took place in a tutorial room, equipped conventionally for teaching purposes.

The two groups worked alongside other tutorial groups who were not taking part in the research. All groups, participating and otherwise, were required to undertake the same task. In this case, as part of their course, they were asked to discuss the topic "Elites in Britain".

At the end of the discussion session, which lasted for 45 minutes, the participating groups were asked to complete the WarwQ.

2.3. PROCEDURE.

Two weeks before the session in which the data were gathered, volunteers were requested to help push back the frontiers of

ignorance (see appendix C). Those who showed interest were told that we were interested in the dynamics of small groups, although as in study 1, they were not told precisely in what sense. Questions, other than those relating to the purpose of the study, were answered freely, and volunteers were given the intervening fortnight to consider whether they would take part. Each one was given a copy of the explanation and consent forms (appendices C & D).

Those who agreed to take part were asked to assemble themselves into two groups. The nature of the task was then explained, and participants were asked if they understood, or had any further questions. Again all questions not relating to the purpose of the study were answered freely. Participants were asked again if they understood the task, and if, in the circumstances they were prepared to continue. It was stressed that they were under no obligation to continue, and that they were entitled to pull out at any point (appendices C & D). In no case did any participant express reservations.

Following the briefing, the tutorial session continued. All groups were asked to discuss the topic for the full 45 minutes, at which point the session was terminated by the researcher (R). Those groups participating in the study were asked to remain behind, and the rest of the groups were dismissed. At this point the questionnaires, which had been prepared during the discussion sessions, were distributed to participants.

As in study 1, the questionnaires were distributed very carefully. The same covert numbering procedure was used as in study1, and the

questionnaires were distributed in the same fashion. In addition, the questionnaires were covertly marked to indicate whether the participant was male or female, using variants on the traditional alchemical symbols for Mars and Venus: ^ for males; + for females.

Once the questionnaires were distributed, participants were told that they could, if they wished, leave the table at which they had sat during the discussions, but it was stressed that they should arrange themselves strictly in the same relative order as they had had around the table. R remained in the room to answer queries. Participants were invited to add pertinent comments to the questionnaires if they felt they were appropriate.

3. RESULTS.

Scores from the uncalibrated ratings scales were derived using a simple ruler measurement in millimetres. Results were entered on an interpersonal matrix (see appendix H), and first choice sociograms were prepared as described in chapter 9.

3.1. GROUP 7.

Group 7 shows some evidence of role differentiation; there were two members (4 & 1) prominent on Ideas, although only one of them (1) appeared prominently on Guidance (see figure 11.1). On Liking, however, group member 3 achieved most prominence, and the same person also received most choices on Leader Behaviour. So, not only does the group give evidence of role differentiation, but, it seems, selected its Leader, in terms of the Leader Behaviour

question, on the basis of social-emotional criteria, as denoted by Liking.

Figure 11.1. FIRST CHOICE SOCIOGRAMS FOR GROUP 7. (N = 4)

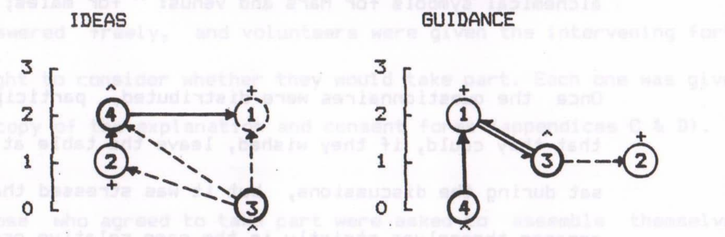
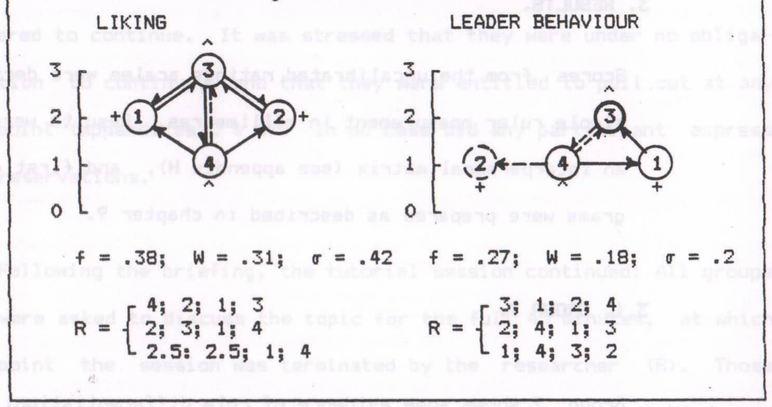


Figure 11.2. FIRST CHOICE SOCIOGRAMS FOR GROUP 7. (N = 4)



Looking more closely, however, the situation is less clear than the summary given above suggests. Ratings given on Ideas and Guidance are generally low (average scores = 49 and 55 respectively). Moreover, although the structure for Ideas displays some coherence, that for Guidance has the appearance of a chain, interrupted only by the mutual choice of 1 and 3. A similar situation

is apparent in relation to the Leader Behaviour diagram. It is only in relation to Liking that there is any real coherence. Here number 3 is most definitely the best-Liked group member, and, moreover, everyone receives some choice. Ratings here are generally high (mean rating overall = 69), which would indicate a fairly cohesive group in terms of interpersonal affect (Knoke & Kuklinski, 1982). The only low rating is that from 2 to 4 (46).

Overall, it seems reasonable to conclude that, although a cohesive group, group 7 hasn't developed strong task structures; there is no-one who emerges clearly as task specialist, although person 1 seems to be the best candidate. Nevertheless, there is some indication that a weak form of role differentiation (weak, that is, because of the weak task structures), might have occurred.

One feature of the groups that have been examined so far and which can be seen in group 7, cannot be over stressed. This is the fact that in many cases it is not at all obvious who is most chosen on any of the sociometric criteria. Although there is often some one person who emerges at the top of the diagrams, because these diagrams are first choice sociograms, each choice for a different person diminishes the focus of the group on the person who does appear at the top. The analytical implication is that each such choice makes it less clear who, if anyone, should be identified at the top of the scale, and this, of course, makes it less easy to conclude whether role differentiation has, or has not, occurred.

On the other hand, the complexity, and frequent lack of clarity,

in the derived structures, gives an impression of dynamic processes in the groups, which is lacking from the conventional approach as exemplified by the use of simple summary vectors.

3.2. GROUP 8.

Figure 11.3. FIRST CHOICE SOCIOGRAMS FOR GROUP 8. (N = 4)

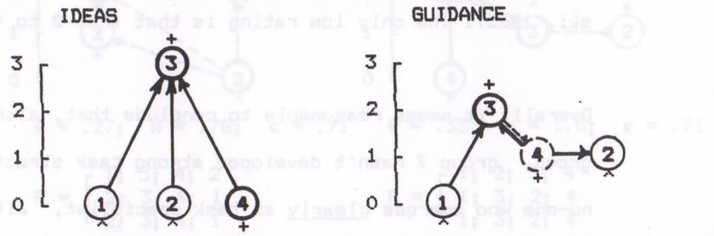
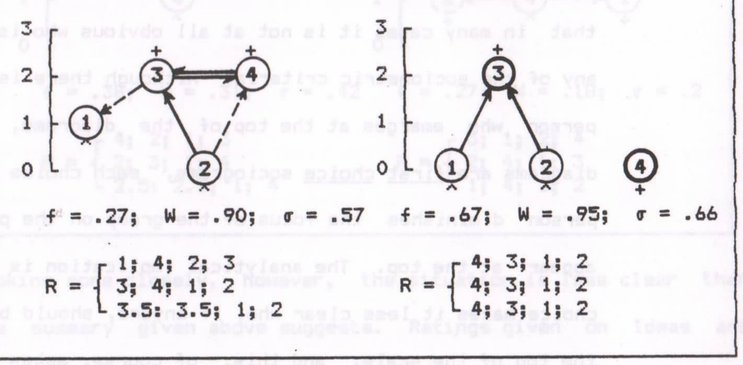


Figure 11.4. FIRST CHOICE SOCIOGRAMS FOR GROUP 8. (N = 4)



The diagrams from group 8 in relation to Guidance, Liking and Leader Behaviour, serve, to some extent, to reinforce the point made at the end of the last section, that is, it is not clear who,

if anyone, should be identified as top on these criteria. The diagram for Ideas, however, exemplifies the situation when it is beyond doubt who comes top. Number 3 is clearly the Ideas person of this group, with no rivals or assistants. For Guidance, however, the structure is very loose, and although number 3 is again at the top, number 2 dissents, and makes no choices at all, and presumably, therefore, does not consider anyone to have been a discussion guide.

The raw scores underlying both of these diagrams are generally low (mean ratings for Ideas = 50; Guidance = 45). Those for person 3 on Ideas are, of course, higher than everyone else's received ratings, but even so the range is only 55 - 72, with person 4 making the lowest rating. This suggests that although person 3 is seen to have contributed most of the Ideas, and marginally most in relation to Guidance, nevertheless the group seems not to have developed clear task specialisation in terms of perceived quality.

The Liking diagram suggests that 3 (the Ideas person) and 4 are jointly the most popular group members. It is interesting that these two make a mutual choice, despite 4's mediocre rating of 3 on Ideas. Overall, however, the scores are middling (mean score = 50), and seldom rise above 60. 3 makes the highest ratings (average 64, with a range of 41 for person 2, to 76 for person 4). Number 1 does not rate anyone as Likeable (average rating = 20, with a range of 11 to 29). So overall it appears that the group is not a particularly cohesive one in terms of interpersonal affect.

The Leader Behaviour diagram once again has number 3 at the top.

This would suggest that the group is approaching a Great Person structure, notwithstanding the discussions above. It can be seen, however, that number 4 once more dissents, and rates only herself as top (rating = 100). Everyone else gives number 3 a top rating (100), including number 3 herself, and gives the rest of the group's members very low ratings (range = 0 - 47). The exception here is number 3, who rates number 4 at 84. This perhaps indicates that number 3 sees number 4 as a lieutenant, although number 4 clearly doesn't see it that way.

Overall, then, group 8 has one person (number 3), who comes clearly top on Ideas and marginally top on Guidance. She is joint top (with number 4) on Liking , and seems to be the majority choice for Leader, although with some dissent from number 4. This suggests a Great Person group, although in view of the background to the diagrams (the raw scores), it seems better to describe it as a group approaching a Great Person structure, but which hasn't fully developed it.

4. SUMMARY AND CONCLUSIONS.

In these two groups, then, there is one which shows a tendency towards role differentiation (group 7) and one which shows a tendency towards a Great Person structure (group 8). In neither case, however, is the structure clear and unequivocal.

In the first case, there is one person who comes clearly top in relation Liking, but the task structures (Ideas and Guidance) are weak, and so is the Leader Behaviour structure. Nevertheless, it

is apparent that the person who is rated as best-Liked within the group is not the same as those who appear to come top on Ideas and Guidance, which, by definition, is an occurrence of role differentiation. On the other hand, the best-Liked group member appears to be top in relation to Leader Behaviour, and so this group appears to be structuring itself around social-emotional factors, perhaps as a result of the failure to establish clear task structures.

Group 8, on the other hand, displays a weak tendency towards a Great Person structure. There is a clear choice in relation to Ideas, and the same person is rated joint top on Liking. The same person is also highly chosen in relation to Guidance and Leader Behaviour, but in both these cases the structures are weak and not clear cut.

CHAPTER 12: STUDY THREE - MULTI-SESSION GROUPS.

1. INTRODUCTION.

This study is concerned with three tutorial groups from which data were gathered for three sessions. As in studies 1 and 2, groups were asked to complete the WarwQ, and therefore role differentiation will again be examined in relation to Ideas, Guidance and Liking.

2. METHOD.

2.1. SUBJECTS.

14 subjects (Ss), 5 women and 9 men, arranged themselves into 3 groups, two single-sex and one mixed sex (see appendix B). Participants were undergraduate management students meeting as tutorial groups as part of a course in the "Fundamentals of Social Science". Participants were all volunteers (see appendices C & D), and group sessions took place early in the course before the students had time to develop extensive friendships with one another, although in other respects it proved to be impossible to ensure that they were completely unacquainted.

2.2. TASK.

The apparatus consisted of the WarwQ (see appendix E). Group sessions took place in a tutorial room conventionally equipped for teaching purposes.

As in study 2 the participating groups worked alongside other groups who were not taking part in the research; all groups undertaking the same tasks with the exception that the participating groups were asked to complete the questionnaire at the end of the session (see appendices C & D).

All groups were asked, as part of their course, to discuss set topics relevant to a recent lecture. These, it should be noted, were set by the course convener, and not by the researcher. For the period during which the research was carried out the set topics were:

Session 1: Scientific Management and the Human Relations Movement.

Session 2: "Has the managerial revolution succeeded?"

Session 3: "Can management "cure" alienation? - What makes people work?"

2.3. PROCEDURE.

The procedure was exactly the same as for study 2, with one exception. In this case, because data were to be gathered over several sessions, it was necessary to devise some procedure which would allow data to be matched from session to session without compromising confidentiality. The system which was adopted (and later incorporated into the SGQ - see appendix G) was to ask particip-

ants to tag their questionnaires with a symbol of their own devising, and which they could keep comparatively secret. These symbols were recorded under the group's number (see appendix H).

It should be noted that this procedure ensured the confidentiality of the participants, but also created a situation in which the researcher had to rely on participants to remember both their groups and their symbols, there being no independent record.

3. RESULTS.

Scores were derived using the procedures described in studies 1 and 2.

3.1. GROUP 9.

a) Session 1:

Figure 12.1. FIRST CHOICE SOCIOGRAMS FOR GROUP 9. (N = 5)

(Session: 1)

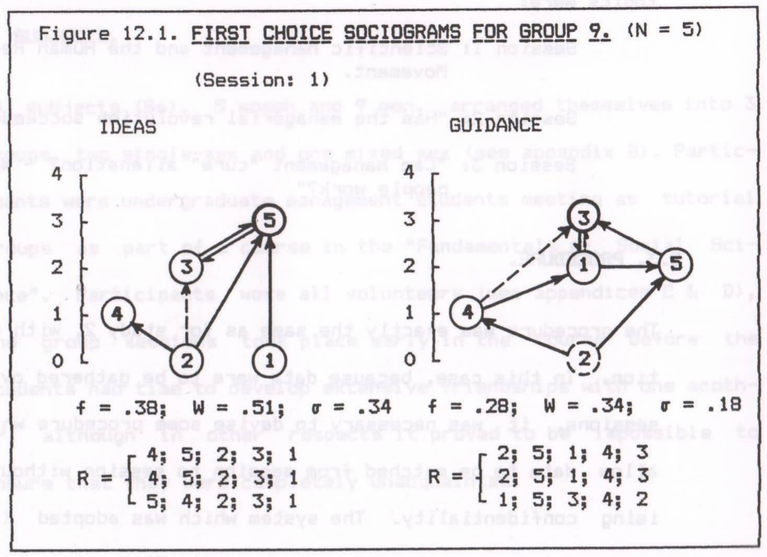
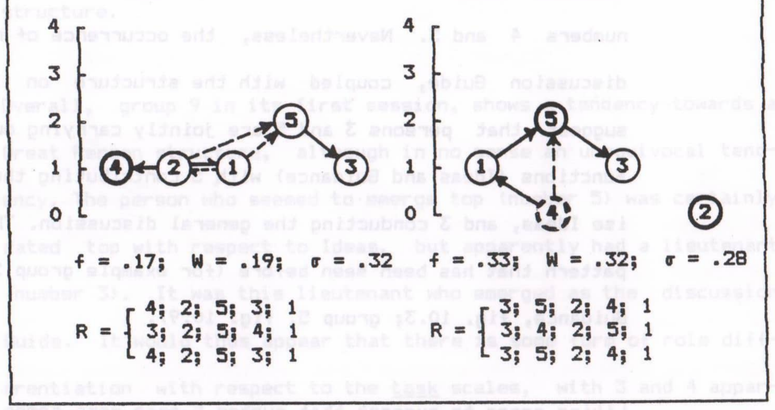


Figure 12.2. FIRST CHOICE SOCIOGRAMS FOR GROUP 9. (N = 5)

(Session: 1)



Group 9 was, by choice, an all-male group.

From the four sociograms shown above (figures 12.1 & 12.2) it can be seen that there is one individual who begins to emerge from the rest of the group (person 5) who is, to a large extent seconded by another (person 3). This is particularly clear in regard to Ideas, where a pattern which is becoming familiar in these analyses is shown. Person 5 receives most choices (in this case 3) but is closely followed by number 3 (who received 2 choices). As it has been seen in other similar cases there is a mutual choice between them, suggesting some form of joint co-operative effort (for examples, see fig. 10.3, group 2 on Guidance; fig. 10.10, group 5 on Liking and Leader Behaviour; and fig. 10.11., group 6 on Guidance. - Other similar examples are shown later). The only dissent shown in regard to number 5 as Ideas person is from number 4, who chooses no-one, although the highest rating he gives is to number 5 (rating = 54).

With respect to Guidance, however, there is a change at the top. Person 5 is replaced by person 3, who receives 3 out of 4 possible choices. Dissent here comes from person 2 who chooses instead numbers 4 and 5. Nevertheless, the occurrence of number 3 as discussion Guide, coupled with the structure on Ideas, would suggest that persons 3 and 5 are jointly carrying out the task functions (Ideas and Guidance) with 5 contributing the more precise Ideas, and 3 conducting the general discussion. This is also a pattern that has been seen before (for example group 2, Ideas and Guidance, fig. 10.3; group 5, fig. 10.9).

Liking seems to suggest that number 5 once more comes top, but in this case there is really little coherence, or integration, in the structure. Generally the scores are low (mean rating = 55), and numbers 4 and 3 choose no-one. Number 3, who appeared to be the discussion Guide, is generally not very popular (mean rating = 41), except with number 5, who gave him a rating of 69. 2 and 1 appear to have formed a small clique, which includes number 5 but receives no choice from him. Overall, there is not a lot of Liking within this group, and number 5 emerges as top not so much by general approbation from the group, but rather because he is most chosen in a situation where there are few choices.

The same situation is observable with respect to Leader Behaviour. Here, once again, number 5 is apparently top choice, but again it is principally because there are few choices generally. As with Liking, ratings in respect of Leader Behaviour are generally low to middling (mean rating = 58), especially from number 3 (who gave

ratings of between 33 - 54, with a mean of 48). Number 2 chose no-one except himself. In respect of Leader Behaviour, therefore, it seems that this group has not developed anything other than a weak structure.

Overall, group 9 in its first session, shows a tendency towards a Great Person structure, although in no sense an unequivocal tendency. The person who seemed to emerge top (number 5) was certainly rated top with respect to Ideas, but apparently had a lieutenant (number 3). It was this lieutenant who emerged as the discussion Guide. It would thus appear that there is some form of role differentiation with respect to the task scales, with 3 and 4 apparently accomplishing the task activities of the group jointly. In relation to Liking and Leader Behaviour there are only weak structures, although with number 5 again appearing as top choice. In both cases, however, number 5 only appears as top choice because there are generally few choices made, thus it would appear to be more reasonable to conclude that there is no one person who emerges as top choice on these two scales.

b) Session 2.

Session 2 for this group did not occur because only two of the group members were present. It is perhaps significant that one of these was number 5, who, insofar as it is possible to talk in these terms in relation to this group, appeared to be fairly high in the status order of the group, appearing most evidently as the Ideas person of the group. The other member present was person 4.

c) Session 3.

Figure 12.3. FIRST CHOICE SOCIOGRAMS FOR GROUP 9. (N = 5)

(Session: 3)

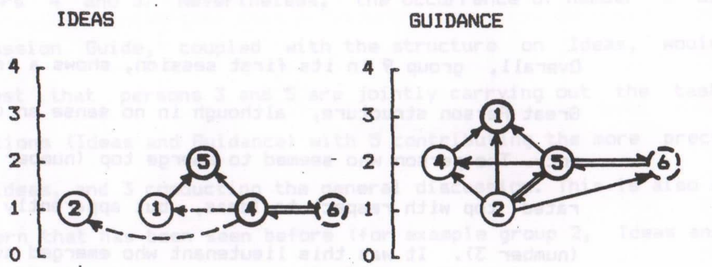
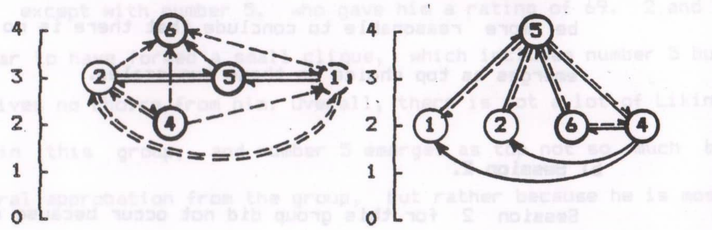


Figure 12.4. FIRST CHOICE SOCIOGRAMS FOR GROUP 9. (N = 5)

(Session: 3)



Group 9 had an unscheduled personnel change for session 3 which only became apparent after the questionnaires had been completed and returned. Person 3 (the group member who emerged as discussion

Guide in session 1) failed to reappear and was replaced by a new member signified as number 6 on the sociograms. It is to be regretted that the change was not noticed earlier because it might have been useful to discover why number 3 dropped out. Number 6 gave his reason for joining the group as "intrigue" about what the group was doing.

Once again person 5 emerges as top in relation to Ideas. The structure this time, however, is very much weaker than it was for session 1. In point of fact the whole structure takes on the appearance of a chain; if the ratings given by person 4 are removed, the entire structure disappears, thus making person 4, in the language of graph theory, a "cut-point" (Knoke & Kuklinski, 1982). In this case, therefore, it is possible that number 4 is playing something of an integrative role.

Apart from the ratings given by person 4 (whose average rating given to others is 95.5), overall ratings are mediocre. Person 5 chooses no-one except himself, and person 2 chooses no-one at all. Thus, group 9 failed to develop a clear structure with regard to Ideas in session 2.

Unlike the Ideas structure, that for Guidance is well integrated, if diffuse. Person 1 emerges as the discussion Guide this time. It is interesting to note that this member did not generally figure prominently in the structures derived from session 1, but nevertheless does appear quite high on Guidance for that session. Indeed, number 1 and number 3 (the discussion Guide of session 1)

make a mutual choice on Guidance (see fig. 12.1). Furthermore, it is interesting to note that number 1 makes a self-choice only, for Ideas, in this session. It is also noteworthy that members 2 and 5 choose everyone, and that it isonly their choices which lend integration and give the distributed appearance to the structure.

The Liking structure is very interesting. Number 6 (the new member) is clearly very popular. Apparently his entry into the group did not create any difficulties. Indeed, he is apparently the most popular group member. The most interesting feature of the Liking structure is, however, the integration that it displays. There is a lot of mutual choosing, which is interesting in itself because this is a first choice sociogram. What this suggests is a lot of high mutual regard within the group. The only point of tension detectable is in the rating given to number 4 by number 1 (31). Also, person 6 chooses no-one, although this is as likely to be as a result of his being a new member, and therefore unfamiliar with the others, as it is to be a sign of disregard. Otherwise, ratings are generally high (mean rating overall = 67), and, in terms of the figure above, are mutual first choices.

Thus, athough number 6 emerges as top choice, which is principally as a result of his not having chosen anyone else in the group, the structure is fairly clearly a distributed one, with no one person emerging as best-Liked.

Finally, turning to the Leader Behaviour sociogram (fig. 12.4) member 5 clearly emerges as top, being chosen by everyone. It is also interesting to note that he in turn chooses everyone, as does

person number 4. This repeats the choice pattern for Ideas (fig. 12.3) although with a different outcome because there are generally more choices made.

There is something curious about the development of this group. Person 5 seems to have relinquished, in some way, prominence on all individual scales. It will be recalled that in session 1 he appeared prominently on all of them, especially Ideas. This time, although he is not unchosen with respect to any particular scale, he is not obviously the most chosen person either. Even with regard to Ideas, where he appears as top, it is not an unequivocal choice by the group. In respect of Leader Behaviour, however, the choice is clear. So, whatever person 5 did within the discussion of session 3, it was apparently not related particularly to the contribution of Ideas or to discussion Guidance. Neither was he the most popular individual. And yet whatever he was doing was sufficient for the group to choose him as Leader, in terms of the Leader Behaviour scale.

It is not obvious how the development of this group relates to the role differentiation hypothesis. In session 1 there was a clear Ideas person, who had a deputy. The deputy appeared to be the discussion Guide. There was no obviously best-Liked person, and Liking was generally low. There was no obviously chosen Leader. In session 3, there was a marginal Ideas person (the same person as in session 1), and a discussion Guide who was not the Ideas person. There was no one person who was obviously best-Liked (this time because Liking was generally high and distributed) and a

clearly chosen Leader. The most obvious role differentiation in both cases was not between the task and social-emotional areas, but between the specific and general task functions denoted by Ideas and Guidance.

3.2. GROUP 10.

a) Session 1.

Figure 12.5. FIRST CHOICE SOCIOGRAMS FOR GROUP 10. (N = 4)

(Session: 1)

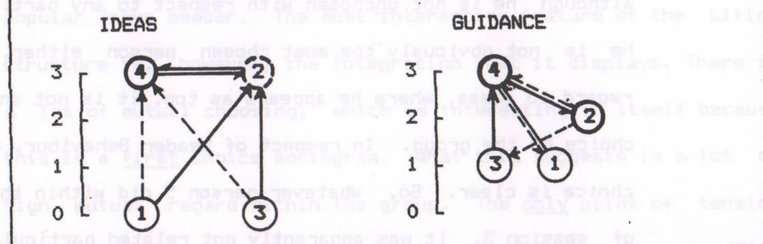
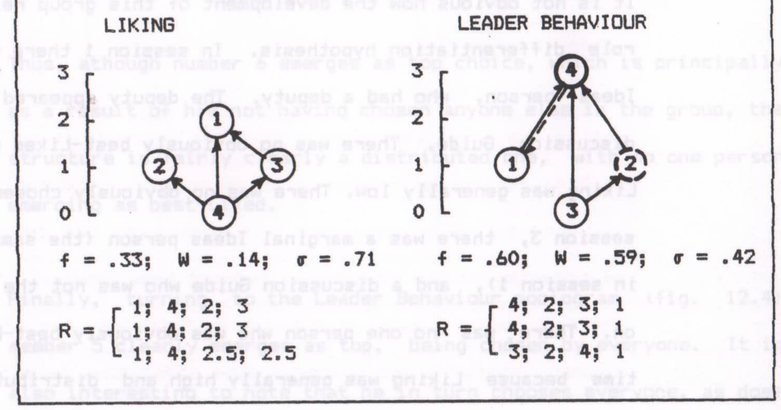


Figure 12.6. FIRST CHOICE SOCIOGRAMS FOR GROUP 10. (N = 4)

(Session: 1)



Group 10 was an all-female group (for which they laid the responsibility on group 9). It seems that some of the members of this group wanted to join group 9 but were rejected. Which members this involved, and why they were rejected, was not made clear, and all of those involved were reticent about giving the reasons.

Turning to the sociograms, it can be seen that with respect to Ideas there is something of a joint structure involving persons 4 and 2. As noted earlier, this seems to be a fairly common arrangement. In this case both are selected by the other two members, and also make a mutual choice. Looking more closely, it will be seen that person 2 receives first choices (bold arrows), and person 4 receives second choices (dotted arrows), so it is possible that number 2 is seen as the group Ideas person, with number 4 as a deputy of some sort.

The pattern for Ideas is repeated to some extent in relation to Guidance, although this time person 4 receives most votes, and overall the structure is more distributed. It is worth repeating that this tendency for the Guidance structure to be more diffuse and distributed than those for Ideas seems to be a general feature that is emerging in these examinations (see for example group 1, fig. 10.1). In relation to group 10 we see that the same two people who emerged as top in relation to Ideas are also high in relation to Guidance. Person 4, who was described above as a possible deputy to number 2 in relation to Ideas, here emerges as discussion Guide, with number 2 as deputy. Once more, this form of role differentiation, in terms of specific task activities (Ideas)

and general task activities (Guidance) seems to be fairly common (see section 3.1.a above). Nevertheless, the general diffuseness of the structure is worth emphasising; although number 4 and, to a lesser extent number 2, are clearly the discussion Guides of the group, the general feeling (largely due to the rating given by 2 & 4) seems to be that everyone contributed to some extent to discussion Guidance.

The apparent coherence of this group breaks down in relation to Liking (fig. 12.6). There is a tendency towards chaining, and, apart from 3's choice of number 1, the only group member who chooses anyone is number 4, who chooses everyone. Person 1 gives everyone the same low rating (uniformly 49); person 3 chooses only number 1, and gives everyone else a low rating (39, 46). So, this group seems not to be very cohesive, in terms of interpersonal affect. In particular, the apparent emergence of number 1 as best-Liked person appears to be more artifactual than based on a genuine group choice.

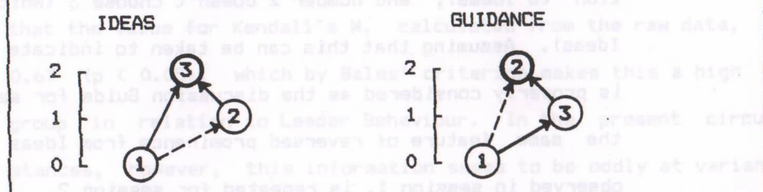
In relation to Leader Behaviour, the coherence returns. Member number 4 is clearly the group's choice, being chosen by everyone, including herself. Number 2 is chosen by number 3, and is given a second choice by number 1, although it is outside the 10 point criterion given earlier (chapter 9).

So what seems to have emerged within this group during session 1 is a clear, dual structure in relation to Ideas, with person 2 apparently being seen as the Ideas person, with number 4 playing deputy. This is repeated to some extent in relation to Guidance,

although the choices seem to have been reversed, with number 4 acting as main discussion Guide, and number 2 acting as deputy. The pattern is carried through, to some extent, to Leader Behaviour, although in this case number 4 clearly emerges as top, in which case the generalised function denoted by Guidance seems to be the main criterion upon which this group has made its Leader choice. The Liking structure of the group is, however, lacking in coherence. There is no clear choice of the best-Liked group member, and in point of fact in respect of interpersonal affect the group seems to be lacking in cohesion.

b) Session 2.

Figure 12.7. FIRST CHOICE SOCIOGRAMS FOR GROUP 10. (N = 4)
(Session: 2)



The first thing to note about session 2 is that person 4, who appeared high in the general status order of the group in session 1, was not present. The reasons for her absence are unknown. This means that technically the group failed to meet one of the basic criteria for a "group" given earlier (chapter 3), because it was less than 4 members. Nevertheless, there is some sense in observ-

ing what took place during session 2, because it seems to have a bearing on what took place during session 3.

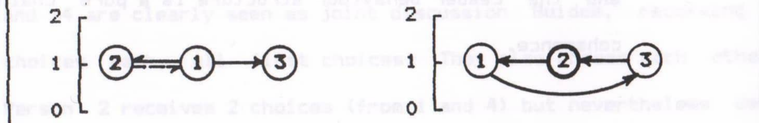
In terms of Ideas (fig. 12.7) person 3 emerges as the choice of the other two, although person 1 makes a dual choice and includes number 2. This is interesting, because person 1 didn't figure prominently on any of the criteria during session 1, and perhaps her current prominence is due to the absence of number 4. It is also interesting to note that person 2 was the Ideas person for session 1, and appeared as deputy discussion Guide for the same session.

In relation to Guidance, the positions of 2 and 3 are reversed, principally because number 3 chooses 2 (which she didn't in relation to Ideas), and number 2 doesn't choose 3 (which she did on Ideas). Assuming that this can be taken to indicate that number 2 is properly considered as the discussion Guide for session 2, then the same feature of reversed prominence from Ideas to Guidance observed in session 1, is repeated for session 2.

Liking (figure 12.8) is very clearly not differentiated, and in fact repeats some of the same disjointure observed during session 1. Person 3 gives low ratings all round (mean = 43), which is interesting in view of the fact that she gave number 1 a high rating during session 1. Person 1 Likes both of the other two, and person 2 also Likes both of the others, although she Likes number 3 less than number 2. By any interpretation, however, no-one is clearly best-Liked.

Figure 12.8. FIRST CHOICE SOCIOGRAMS FOR GROUP 10. (N = 4)

(Session: 2)



LIKING: f = .17; W = .77; σ = .71

R = { 1; 3; 2 / 1; 3; 2 / 1; 2.5; 2.5 }

LEADER BEHAVIOUR: f = .25; W = .67; σ = .57

R = { 2; 1; 3 / 2; 1; 3 / 2; 2; 2 }

The structure for Leader Behaviour (fig. 12.8) is a pure chain, with no general coherence; 1 chooses 3; 3 chooses 2; 2 chooses 1. Obviously no sense can be made of such a structure, and it seems best to conclude that there isn't one. It is interesting to note that the value for Kendall's W, calculated from the raw data, is 0.67 ($p < 0.05$), which by Bales' criterion makes this a high SC group in relation to Leader Behaviour. In the present circumstances, however, this information seems to be oddly at variance with the structure that seems to have not emerged.

It is difficult to interpret the structures that seem to have emerged in this group during its second session, principally because of the small number of people involved. The most interesting feature overall, however, is that person 3, who did not figure with any prominence during session 1 seems to have become active during session 2. She appears, in this respect, to have emerged as the Ideas person, although not discussion Guide. It is person 2 who appears to be discussion Guide for session 2,

and it is interesting to note that she was the Ideas person, and possibly also deputy discussion Guide, for session 1. The Liking structure shows the same disjointure that it did during session 1, and the Leader Behaviour structure is a pure chain showing no coherence.

Taken jointly, therefore, this group seems on two occasions to have developed fairly clear task (Ideas and Guidance) structures, and weak Liking structures. The Leader Behaviour structure for session 1 was very clear, but in session 2 was very weak. It is important to note that the person top on this structure during session 1 (person 4) was absent during session 2, and this may, perhaps, explain the weak structure during the later session.

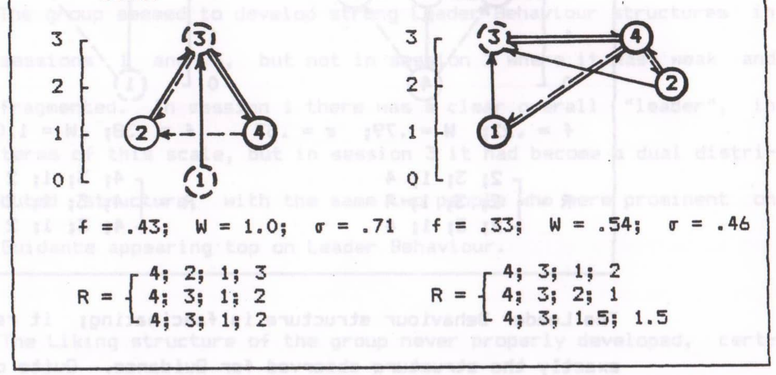
c) Session 3.

Person 4 returned to the group for the third, and final, session. Once more, as it can be seen in the sociograms, she resumed a position of prominence within the group, but clearly the intervening session seems to have had an effect on the nature of the structures which eventually emerged.

The sociogram for Ideas (fig. 12.9) shows that person 3 has emerged very clearly as the Ideas person, receiving choices from all other group members. Person 4, who was joint top on Ideas for session 1, receives only one choice, and that from person 3. Person 2, who was also joint top on Ideas in session 1, and was probably chosen as Ideas person for that session, again receives only one choice, from person 3.

The Guidance sociogram repeats earlier trends, in that the person chosen as Ideas person is to some extent replaced by another member as discussion Guide. In this case, however, both persons 3 and 4 are clearly seen as joint discussion Guides, receiving 3 choices each, all first choices. They also choose each other. Person 2 receives 2 choices (from 1 and 4) but nevertheless does not achieve the same prominence that she had in session 1. Overall, however, although persons 3 and 4 are joint top in regard to Guidance, once more the structure is more distributed than that for Ideas.

Figure 12.9. FIRST CHOICE SOCIOGRAMS FOR GROUP 10. (N = 4)
(Session: 3)

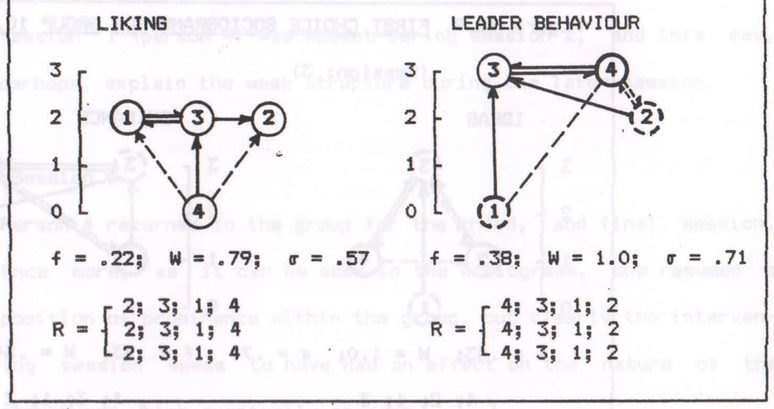


The Liking structure (fig. 12.10) seems to have achieved more coherence than it had in either session 1 or 2. The ratings are overall higher (mean rating overall = 68), but there are still tensions apparent. Person 3 doesn't Like person 4, giving her a rating of only 56, whereas the rest of the ratings she gives are 68. Perhaps she sees person 4 as a rival, but it is perhaps significant that she gave a similarly low rating to number 4 in

session 1. Person 1 only Likes person 3 (rating = 73), but seems not to Like the rest of the group (ratings ranging from 43 - 47). Person 4, however, as in session 1, gives everyone a high rating (83 - 88). Obviously, from the shape of the structure, there is no one person who emerges as best-Liked, but nevertheless, it is doubtful whether the Liking structure for this group really is particularly coherent anyway because of the under tow of "not-Liking".

Figure 12.10. FIRST CHOICE SOCIOGRAMS FOR GROUP 10. (N = 4)

(Session: 3)



The Leader Behaviour structure is fascinating; it repeats almost exactly the structure observed for Guidance. Quite clearly person 3 established herself during the absence of person 4, and has achieved prominence within the group. It is not stretching inference too far to suggest that it may have been her performance during session 2 which established her. Person 2 seems to have lost influence, although she too is high in relation to Leader Behaviour. The most consistently low rated person within the group is person 1, although only in relation to Ideas, Guidance and

Leader Behaviour, because she receives a number of choices in relation to Liking.

Taken overall, the development of this group seems to have progressed on the basis of task activities alone, because in each of the three sessions there were strong Ideas and Guidance structures but otherwise only weak structures. As far as role differentiation is concerned it is <u>within</u> the task activities that it seems to have occurred in this group. In session 1 there was apparently one person who was Ideas person, and a second one who became discussion Guide. This pattern repeated itself in sessions 2 and 3, although not involving the same people.

The group seemed to develop strong Leader Behaviour structures in sessions 1 and 3, but not in session 2 where it was weak and fragmented. In session 1 there was a clear overall "leader", in terms of this scale, but in session 3 it had become a dual distributed structure, with the same two people who were prominent on Guidance appearing top on Leader Behaviour.

The Liking structure of the group never properly developed, certainly not to the point where any one person could be identified as best-Liked in any of the sessions.

3.3. GROUP 11.

a) Session 1.

The final group in this series of studies is group 11. This, unlike the other two groups of the series, was a mixed group,

comprising one female member (person 1) and four males. For the purposes of the diagrams that follow, the female group member will be distinguished by a +.

Figure 12.11. FIRST CHOICE SOCIOGRAMS FOR GROUP 11. (N = 5)

(Session: 1)

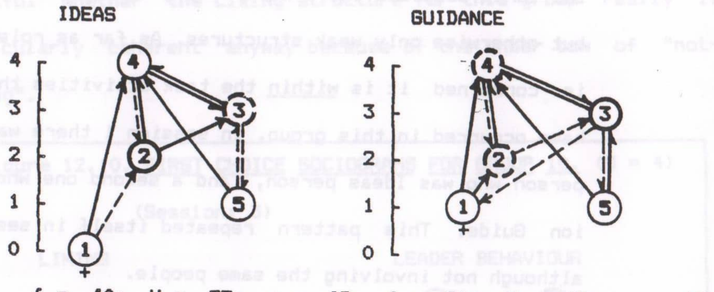
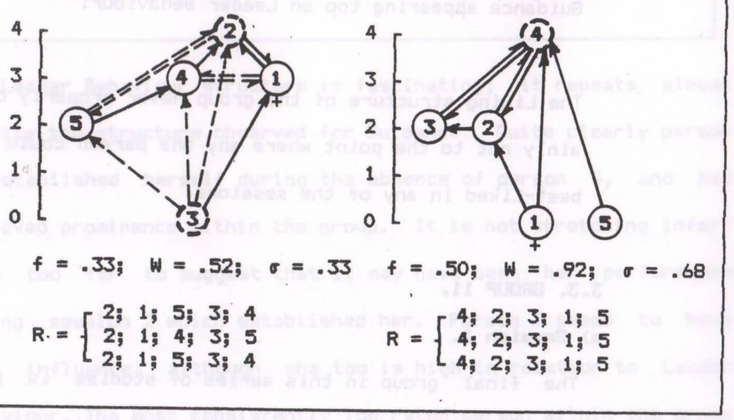


Figure 12.12. FIRST CHOICE SOCIOGRAMS FOR GROUP 11. (N = 5)

(Session: 1)



The first thing of note about group 11 is the structure that emerges in relation to Ideas (fig. 12.11). Person 4 is clearly chosen as Ideas person, receiving the choices of all other group members. It will be seen, however, that he is closely followed by person 3, who receives 3 choices. This yields a structure which has become familiar through studying these groups; one person who is most chosen, apparently seconded by another person. This is what has been referred to earlier as a form of dual distributed specialisation.

The structure is repeated almost identically for Guidance, with only minor differences. Amongst these is the choice for number 1 from number 3. Thus for this group there is a form of distributed task specialisation which involves two members of the group (4 & 3). That these two make mutual choices for both Ideas and Guidance suggests a co-operative situation rather than one of rivalry.

When the Liking structure is examined, however, the structure changes, and in some respects quite dramatically. Neither of the two who appeared at the top of the task scales is top on Liking, although number 4 is high. Indeed number 3 is unchosen on Liking at all, and, although he apparently Likes everyone else, on the basis of his received ratings it is reasonable to assume that he is not very popular (mean rating received = 51; range: 42 - 56). The person most chosen is clearly number 2, who although not top in relation to Ideas and Guidance, is also not bottom either. It should be noted, however, that although undeniably top on Liking, the Liking structure also displays some degree of distribution

amongst the group members. Nevertheless, in Bales' terms this is an example of role differentiation, because the Ideas person (who is also the discussion Guide) is not best-Liked. It can be seen, however, that number 4 is not disliked either. It should also be noted that, although this is an example of role differentiation in Bales' terms, role differentiation of this sort is a comparatively rare occurrence in the groups studied so far in this research.

When the Leader Behaviour structure is examined, it is clear that number 4 is most chosen, receiving choices from all other group members. It is interesting, however, to note that number 3 is once again near the top, as is number 2 (the person who emerged as best-Liked). These three, then, would seem to constitute something like the hierarchy of the group, with number 4 at the head and numbers 2 and 3 fulfilling different functions as lieutenants.

Of course it is not really possible to speculate on the reasons for these structures, in Bales' or any other terms, but looking at the Liking sociogram again, one is struck by the lack of positive affect directed at number 3, and the contrast it makes with his other received ratings. Assuming Bales' equilibrium hypothesis to be correct, it is possible that the negative affect that should have been directed at number 4 (as the task specialist, and therefore as the focus of disequilibrium) has been directed at number 3. In this case number 3 may be playing the part of a scapegoat, but if so, he is not a scapegoat as typically conceived in the literature (see for example Bales, 1956, 1958; Burke, 1969). If number 3 really is a scapegoat, draining or deflecting the negative affect from number 4 (Bales, 1953 a), then he plays the role

while being comparatively active as a task specialist himself, albeit a secondary one who is perhaps subordinate in some way to number 4. It may be that, as a secondary task specialist, it is safer for the group to direct negative affect at him, rather than at the primary task specialist, thus reducing tension but not losing the services of the primary task specialist himself.

b) Session 2.

The sociograms for session 2 (figs. 12.13 & 12.14) indicate clearly that the structures from session 1 have persisted across sessions. Person 4 once again emerges as the Ideas person, and again is closely followed by person 3. Indeed the structures for Ideas from sessions 1 and 2 are remarkably similar. The principal differences seems to be that number 1 has received some choice in session 2, whereas she received no choices in session 1, and person 2 has received one choice less.

Figure 12.13. FIRST CHOICE SOCIOGRAMS FOR GROUP 11. (N = 5)

(Session: 2)

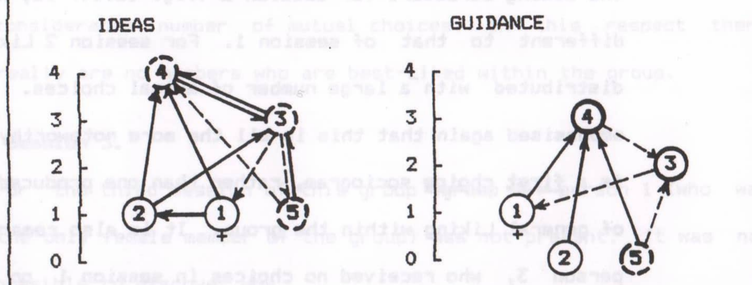
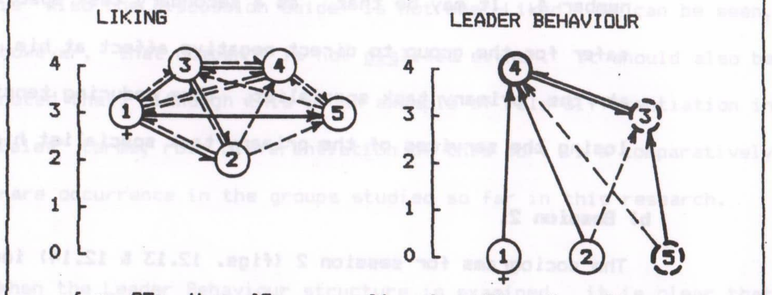


Figure 12.14. FIRST CHOICE SOCIOGRAMS FOR GROUP 11. (N = 5)

(Session: 2)



As it was for Ideas, so also was it for the Guidance structure, which is again remarkably similar to that from session 1. Once again it is number 4 who emerges as top, although less strikingly than in the first session, and person 3 comes a close second.

The Liking structure for session 2 (fig. 12.14) is, however, quite different to that of session 1. For session 2 Liking is very distributed with a large number of mutual choices. It has to be emphasised again that this is all the more noteworthy because this is a first choice sociogram, rather than one produced on the basis of general Liking within the group. It is also remarkable because person 3, who received no choices in session 1 on Liking, now appears to be joint top with person 4, insofar as that is possible in relation to the distributed nature of the structure. Person 2, who was best-Liked in session 1, now appears to be least chosen.

Finally, the Leader Behaviour structure repeats very closely the structures from Ideas and Guidance, with person 4 as most chosen, and person 2 as a sort of deputy. This particular form of structure is, so it seems, a very common one, a point which will be discussed in more detail at the end of the thesis.

Overall, taking the two sessions together, it seems that the basic structure which developed in session 1 (that is the dual prominence of persons 3 & 4), has been carried across to session 2. The differences that have occurred are principally in relation to Liking. Here persons 4 and 3, who are consistently rated high on the task scales (Ideas and Guidance), and Leader Behaviour, were not rated highly on Liking in session 1. In particular person 3 was unchosen. In session 2, however, both are rated more or less joint top, in which case role differentiation, in Bales' terms, has reduced in this group over the two sessions. It is also noteworthy, however, that the Liking structure has become more diffuse from session 1 to 2, and displays a tight knit group with a considerable number of mutual choices. In this respect there really are no members who are best-Liked within the group.

c) Session 3.

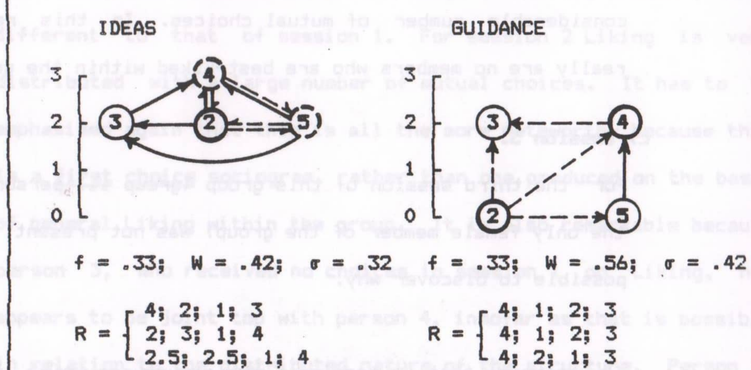
For the third session of this group (group 11) person 1 (who was the only female member of the group) was not present. It was not possible to discover why.

It appears that in session 3 the structures which developed in sessions 1 and 2 have developed further into a more distributed pattern. Person 4, who was the principal member of the group in

the earlier sessions, still appears at the top on Ideas, but by no means as clearly as in the earlier sessions (see fig. 12.15). The Ideas sociogram (fig. 12.15) shows that overall the group members perceive one another as generally much more active, and the structure is close to being a completely distributed one. Nevertheless, the structure from sessions 1 and 2 reappears in the Guidance structure, where once again it is persons 4 and 3 who appear as most chosen. In this case, however, the ratings given are generally lower than in the previous sessions (overall mean rating = 61), and the structure is much looser than previously. In point of fact it is largely a product of the choices made by number 2, without whose ratings the structure would be almost entirely disconnected. So, in this case, although the old structure has reasserted itself, in real terms it is not possible to identify a most chosen individual, or most chosen individuals, because in strict terms the group has not made any firm choices.

Figure 12.15. FIRST CHOICE SOCIOGRAMS FOR GROUP 11. (N = 5)

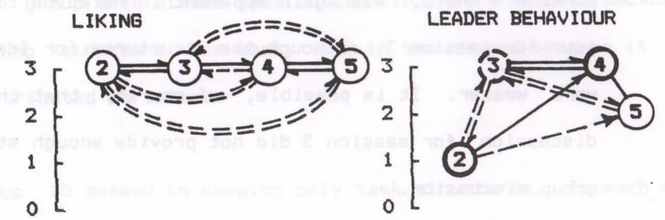
(Session: 3)



The Liking structure for session 3 (fig. 12.16) is striking; it is a pure example of a completely distributed structure. Every member chooses every other member, and although there are preferences (as indicated by the mixture of bold and dotted arrows), nevertheless all the choices are very closely arranged. This group displays very high cohesion in terms of interpersonal Liking.

Figure 12.16. FIRST CHOICE SOCIOGRAMS FOR GROUP 11. (N = 5)

(Session: 3)



Finally, in relation to Leader Behaviour, the old structure is once again apparent, this time more strongly than in the case of Guidance. Here it can be seen (fig. 12.16) that number 4 is again most chosen, along with number 3.

Overall, this group displays a tendency from the beginning to structure itself around the two members denoted as numbers 3 and 4. There was some tendency in the first session towards role differentiation, in Bales' empirical sense, where those rated top in relation to the task scales were not best-Liked, and indeed one of them was unchosen. By session 2, however, this tendency had

disappeared, and the group tended towards a dual Great Person structure, involving the two members 4 and 3, rather than just number 4. On the other hand, the Liking structure for session 2 was more diffuse and distributed in comparison with session 1, and it was less apparent that anyone was best-Liked. By session 3 the Liking structure had become completely distributed, and there was no one person who could be identified as best-Liked because all were equally chosen. Nevertheless, the old structure, involving persons 4 and 3, was again apparent in relation to Leader Behaviour for session 3, although the structures for Ideas and Guidance were weaker. It is possible, of course, that the topic set for discussion for session 3 did not provide enough stimulus for any group discussion.

In terms of the role differentiation hypothesis, there really is little in the way of evidence from this group apart from the slight tendency noted in the first session. The disappearance of this tendency by session 2 tends to undermine the general thesis that role differentiation increases over time (e.g. Slater, 1955), although on the basis of this group alone there is clearly not enough data to claim that the proposition has been refuted. What is noteworthy from this group, however, is the type of dual structure which has been observed several times previously, that is a tendency for some groups to choose one person as top, with another closely chosen alongside, perhaps as a deputy.

4. SUMMARY AND CONCLUSIONS.

Overall there is little support for the role differentiation

hypothesis, in Bales' empirical sense, within any of these groups. Group 9 displayed a tendency towards a form of task focussed role differentiation which has been noted before, that is a differentiation between an Ideas person and a discussion Guide, who jointly seem to undertake the task activities of the group, working in tandem both on Ideas and Guidance but taking precedence on different scales. There was no one person who was obviously best-Liked in this group in either the first or the third session (this being the group that missed session 2), in the first case because the Liking structure was weak, and in the second because it was a distributed structure.

Group 10 seemed to develop only task structures. In each of the three sessions there were strong structures for Ideas and Guidance, and, as in group 9, such role differentiation as there was occured in relation to the task scales. In all sessions there emerged one person as Ideas person, and a different person who was discussion Guide. The people who filled these roles, however, changed from session to session, partly, it might be supposed, due to the absence of one key member during the middle session. This group never fully developed a coherent Liking structure.

Group 11, on the other hand, developed strong structures right from the beginning, although those for Ideas and Guidance became weak towards session 3. This group began with a tendency towards role differentiation, in the Bales' sense, in session 1, although this had disappeared by session 2. The best way to summarise this group is as a dual Great Person structure; one person who seems to take the general lead and a deputy. Of most interest in relation

to this group, however, is the development of the Liking structure. This became gradually more diffuse, finally becoming a completely distributed structure by session 3. This can be interpreted as the development of a group identity, in the sense that as the group met over the three sessions the interpersonal affect developed to the point where everyone seemed to Like everyone else.

CHAPTER 13: STUDY FOUR - SINGLE SESSION GROUPS (Part Three).

1. INTRODUCTION.

Examined in this study were seven groups which met for a single session in a social psychology laboratory. The measuring instrument in this case was the Small Groups Questionnaire (SGQ - see appendices F & G), which, in comparison with the WarwQ, incorporates extended questions in relation to task and, especially, social-emotional activities, and therefore allows a more detailed examination of enacted role behaviours as they are perceived to have occurred within the group. Nevertheless the empirical definition of role differentiation, in terms of Ideas, Guidance and Liking, which has formed the focus for the other studies, will be used as the principal focus in the examination of each of the groups in what follows.

2. METHOD.

2.1. SUBJECTS.

40 subjects (Ss), 32 women and 8 men, arranged themselves into 7 groups, two single-sex and five mixed sex (see appendix B). Participants were undergraduate psychology students fulfilling a course requirement. Every effort was made to ensure that Ss did

not know one another prior to the group sessions, but there were inevitable occasions where this condition was not met.

2.2. TASK.

The apparatus consisted of the SGQ (see appendices F & G), and the same 1½ hour tape recording (based on the transcript of a rape trial) used for study 1.

The group sessions took place in the social psychology laboratory at **Warwick University**, which, as noted in study 1, was equipped with 4 video cameras, a one-way mirror, and a circular table with chairs. Two microphones were placed centrally on the table, and there were armchairs arranged around the periphery of the room.

As in study 1, each group was told to consider itself as the jury convened for the trial of the alleged rapists Bryce and Harrison, and were told that they would have to arrive at a verdict for each of them after hearing the presentation of evidence.

The SGQ Parts I and II were given to each participant to complete.

2.3. PROCEDURE.

The procedure for this study was identical to that used in study 1, with the following modifications. After the briefing session, explaining the purpose of the study, participants were asked to complete the SGQ Part I, which took something in the region of 15 to 30 minutes. During this part of the procedure, and for the ten minutes following, participants were supplied with coffee.

Once all the questionnaires were completed and returned, participants were asked to seat themselves where they felt most comfortable. The tape recording was switched on, and R left the room.

R re-entered the room once the tape had finished, and participants were allowed 15 minutes for a coffee break, following which they were asked to seat themselves around the circular table. The purpose of the discussion was again stressed, and once participants agreed that they understood what they had to do, R left the room and the discussion began.

The discussion was allowed to continue for 45 minutes, when R re-entered the room and asked the group if it had reached a verdict for each of the accused. Participants were then each given a copy of the SGQ, prepared during the discussion, which they were asked to complete. The distribution of the questionnaires followed the same procedure as that used in the previous studies.

As in study 1, participants were allowed to leave the central table for the purpose of completing the questionnaire, but it was stressed that they should retain the same relative ordering as that which they had around the table. R remained in the room to answer queries and make more coffee.

3. RESULTS.

Scores were derived from the questionnaires using the procedures described previously.

As noted earlier, the SGQ contains several different or extended questions to the WarwQ. In all the questionnaire comprises 27 sociometric questions (see chapter 9 section 4.2.b), and it is clearly out of the question to examine results on all of these in detail. For present purposes the most important questions are those relating to perceived Talking (qu. 1); Ideas (qus. 2 & 3); Guidance (qus. 4 a & b); Liking and Disliking (qus. 5 & 8); Hurt Feelings (qus. 9, a, b, & c); Joking (qu. 11); Hostility (qus. 18, a, b, & c); and Cordiality (qus. 20 a & b) - see appendix G. Even so, there is still too much information in these questions for it to be presented succinctly using the sociogrammatic approach, so a selective presentation is necessary. In the present circumstances, therefore, the following results will be considered:

Qu.1: Talking.
Qu.2: Quality of Ideas.
Qu.4b: Successful Guidance.
Qu.5: Liking.
Qu.9c: Effective attempts to Soothe Hurt Feelings.
Qu.11: Joking.
Qu.18c: Successful attempts to Calm Hostility.
Qu.20b: Successful Cordiality.

Of these, Talking is a general scale; Ideas and Guidance will be regarded as task scales, as in previous studies; Hurt Feelings, Joking, and Hostility will be regarded as social-emotional scales. Liking and Cordiality seem to be half-way measures, neither strictly task nor social (Burke, 1972). Nevertheless, in the analyses that follow, they will be used more as indicators of social-emotional activity than task activity, for reasons to be given in the next section.

3.1. GENERAL COMMENT ABOUT THE SOCIAL SCALES.

At the time of compiling the SGQ, it was thought that asking questions about attempts to soothe hurt feelings, and attempts to calm hostility, made little sense if there was not also a question asking whether there were, in fact, any hurt feelings or hostility within the group. As a consequence, questions 9 and 18 were headed by a filter question of the form:

> "Did you, or anyone else, show any hostility?" (Qu. 18 filter question. See appendix G).

As it turned out, no group reported either hurt feelings or hostility, and consequently questions 9 and 18, which were designed as the principal means of identifying social specialists, yielded no information whatsoever. This presented problems, because it meant either that the empirical definition of role differentiation used up to now should be retained, or some other means of identifying role differentiation, should it occur, should be devised.

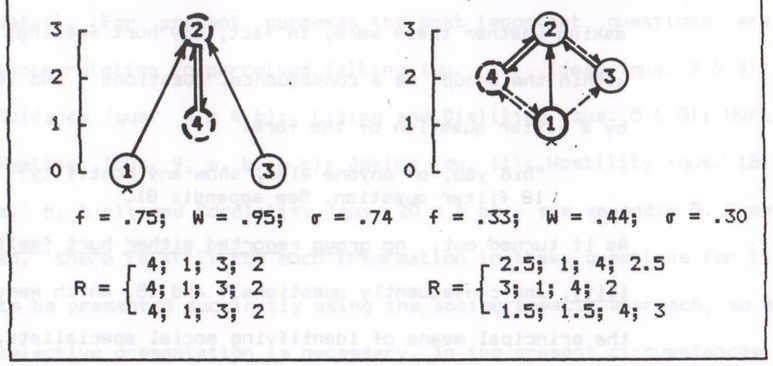
On the other hand, one could simply conclude that role differentiation did not occur in any of these groups because here was no need for a social specialist. But this would be facile. On balance the analyses that have been offered hitherto in these studies have been relatively fruitful, so it was considered reasonable to continue with the same approach, using the remaining six scales from the list above.

3.2. GROUP 12.

The first group in this sample, group 12, comprised 4 members, three female, and one male. The male is indicated on the following

diagrams with an attenuated version of the alchemical symbol for Mars, and is therefore shown by a ^.

Figure 13.1. FIRST CHOICE SOCIOGRAMS FOR GROUP 12. (N = 4)

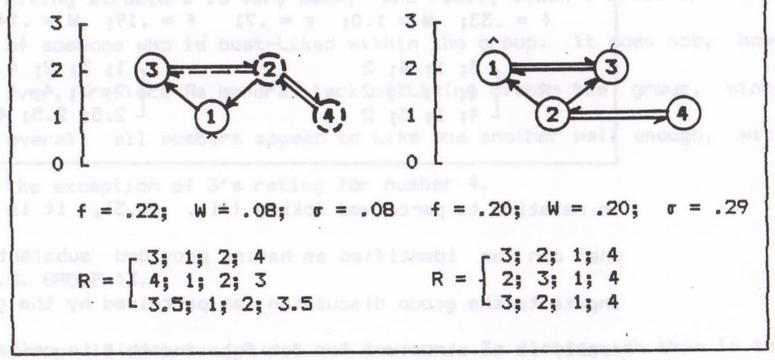


In respect of Talking (fig. 13.1), it is clear that person 2 is seen as most active within the group, seconded to some extent by number 4, although this latter effect is solely due to the choice of number 2 herself. This feature of the group is reflected in the structure for Ideas, which also has number 2 at the top, although in this case the structure is more distributed (as reflected in the values of f: 0.75 and 0.33 respectively). Overall this last structure is fairly tight; each member being chosen at least once. Overall, however, the most salient feature of the structure is that everyone chooses number 2.

In respect of Guidance (fig. 13.2), the structure changes. Although number 2 is still at the top of the diagram, she is very clearly accompanied by number 3, and it is noteworthy that these two also choose each other. Nevertheless, the structure is fairly well distributed (f = 0.22), and it is clear that the group sees a

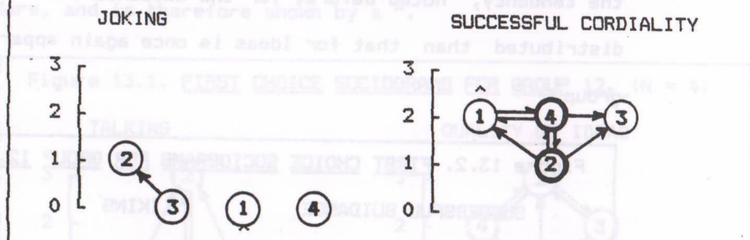
considerable input from each of its members. It is noteworthy that the tendency, noted before, for the Guidance structure to be more distributed than that for Ideas is once again apparent in this group.

Figure 13.2. FIRST CHOICE SOCIOGRAMS FOR GROUP 12. (N = 4)



The Liking structure is again different. Here person 1, who receives very little choice on the other scales, appears at the top of the diagram accompanied by person 3 (joint discussion Guide). To the extent that person 2, the Ideas person, fails to appear at the top of the diagram, then this constitutes an example of role differentiation in Bales' empirical sense. On the other hand, the structure is a weak one, and principally a product of the choices of person 2 (the Ideas person). Without her choices the structure would be disconnected apart from the mutual choice of 1 and 3. Overall, however, apart from a mediocre rating from 3 to 4 (53) the level of ratings is not low (overall mean rating = 69), so the group is not one that is lacking in cohesion in terms of interpersonal affect. Nevertheless, it remains a group for which there is no one person who is obviously best-Liked.

Figure 13.3. FIRST CHOICE SOCIOGRAMS FOR GROUP 12. (N = 4)



In relation to perceived Joking (fig. 13.3), it is clear that no one can be identified as having provided substantial humorous inputs to the group discussion (as perceived by the group). There really is no structure for Joking, and this is reflected in very low ratings given and received (overall mean = 24).

Finally, in relation to Cordiality (fig. 13.3) the structure is very distributed, and there is no -one who is clearly seen by the group as most Cordial. In point of fact group members 2 to 4 give equal ratings to everyone, although number 3 seems not to perceive much Cordiality all the same (rating = 53). Only person 1 differentiates between the group members, and, as it can be seen he chooses person 4 (rating = 75). Otherwise he too gives low ratings (59 and 45).

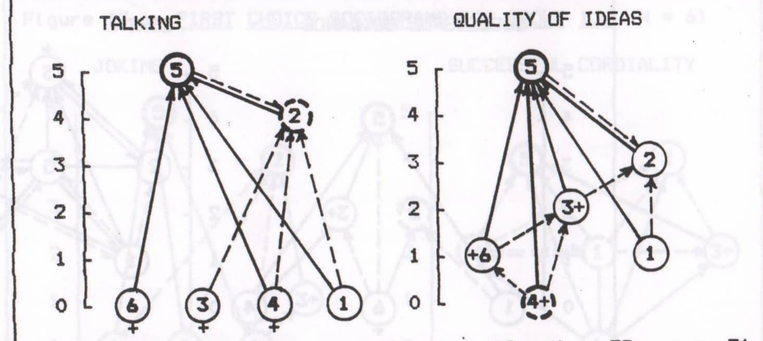
Overall, this group seems not to have had much social activity of any kind. Certainly there seems to have been no Joking to any extent, and group members seem to be divided about whether there

was much Cordiality. On the other hand, there was a clear differentiation in terms of activity, and the person seen as most active (number 2) was also chosen as the Ideas person. The Guidance structure also included the same person at the top, although accompanied by another member (person 3), but this structure is very much weaker, and more distributed than the one for Ideas. The Liking structure is very weak, and really doesn't exist in terms of someone who is best-Liked within the group. It does not, however, reflect a general lack of Liking within the group, since overall all members appear to Like one another well enough, with the exception of 3's rating for number 4.

3.3. GROUP 13.

Group 13 comprised 3 men and 3 women. To distinguish them in the diagrams below, the women will be designated by a +.

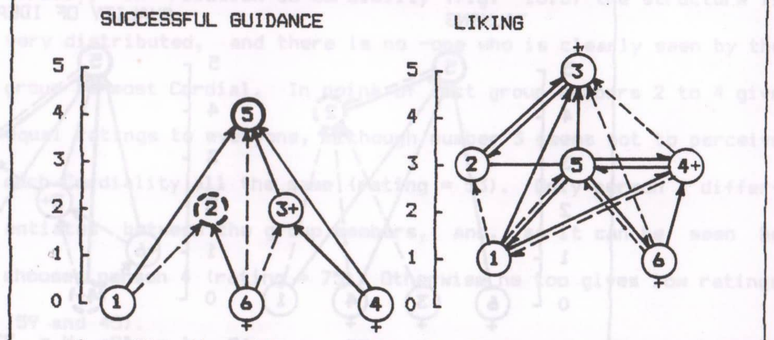
Figure 13.4. FIRST CHOICE SOCIOGRAMS FOR GROUP 13. (N = 6)



There can be little doubt about the structure which has developed in group 13 with respect to Talking. Clearly it is person 5 who was most active, seconded by person 2. This is a kind of structure which has been observed before (see for example group 5 on Leader Behaviour, fig. 10.10), and which has been referred to as a dual distributed structure.

This particular structure is not, however, carried over to Ideas. Here (fig. 13.4) although person 5 is still clearly at the top, the structure is much more distributed, and to some extent less integrated. Apart from the clear overall choice of number 5 as Ideas person, there seems to be a large tendency towards chaining (see for example the choice pattern between persons 2, 3, 4, and 6). This suggests a certain amount of disagreement about what constituted "good" Ideas within this group.

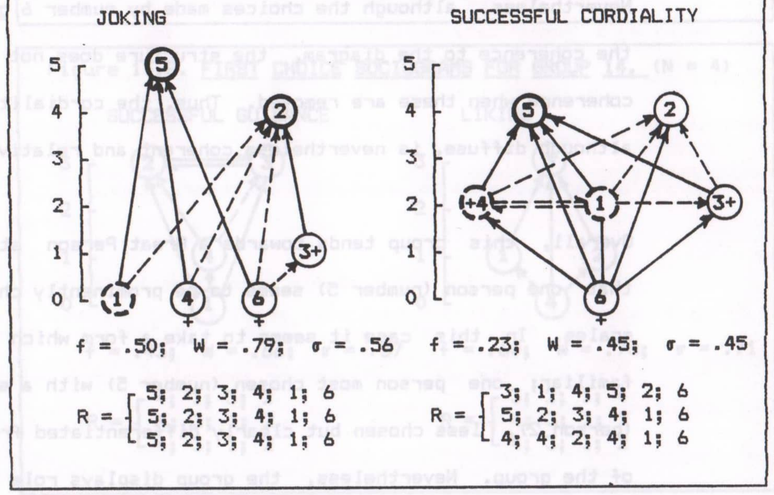
Figure 13.5. FIRST CHOICE SOCIOGRAMS FOR GROUP 13. (N = 6)



The Guidance structure (fig. 13.5) once again shows person 5 as top. To a lesser extent than in the Talking sociogram he is also seconded by persons 2 and 3, and in this respect it is interesting to compare the two diagrams for Ideas and Guidance (see figs. 13.4 & 13.5). There can be little doubt that person 5 is properly considered as the task specialist of this group.

When the Liking structure (fig. 13.5) is examined, it can be seen that person 5 is not top; it is person 3, (who was also chosen to some extent on Ideas and Guidance) who is best-Liked, being chosen by everyone. Nevertheless it will be observed that, as noted before, the Liking structure is more distributed than those for Ideas and Guidance. In point of fact there are no serious dislikes within this group, and everyone seems to Like everyone else to some extent. It is undeniable, however, that this group presents an example of role differentiation in the Balesian sense.

Figure 13.6. FIRST CHOICE SOCIOGRAMS FOR GROUP 13. (N = 6)



Role differentiation does not, however, seem to extend to behaviours which were earlier idenified as social-emotional, that is Joking and perceived Cordiality. In relation to Joking, (fig. 13.6) the structure that was observed in respect of Talking is repeated very closely. The only real difference seems to be that number 3 (the best-Liked person) has received some choice as a person who contributes humour. Besides this, however, clearly person 5 is seen as providing most Jokes, seconded by person 2.

To some extent the same structure is repeated with respect to Cordiality as well (fig. 13.6). In this case, however, it can be seen that the structure is very much less focussed on persons 2 and 5, and is, in fact, fairly well distributed amongst the membership (f = 0.23). There are many choices apparent in this diagram, although only one mutual choice (4 and 1). Number 6 chooses everyone, but is unchosen. It seems that number 6 was seen as relatively inactive in all aspects of the group's activities. Nevertheless, although the choices made by number 6 give a lot of the coherence to the diagram, the structure does not lose all its coherence when these are removed. Thus, the cordiality structure, although diffuse, is nevertheless coherent and relatively strong.

Overall, this group tends towards a Great Person structure, in that one person (number 5) seems to be prominently chosen on all scales. In this case it seems to take a form which has become familiar; one person most chosen (number 5) with a second person (person 2), less chosen but clearly differentiated from the rest of the group. Nevertheless, the group displays role differentia-

tion, in Bales' empirical sense, because this person is not best-Liked, and someone else (person 3) is. Role differentiation does not, however, extend to activities which have been designated as social-emotional, such as Joking and Cordiality. For these scales the same structure as that observed for Talking is once more apparent, that is person 5 receiving most choices followed by person 2.

3.4. GROUP 14.

Figure 13.7. FIRST CHOICE SOCIOGRAMS FOR GROUP 14. (N = 4)

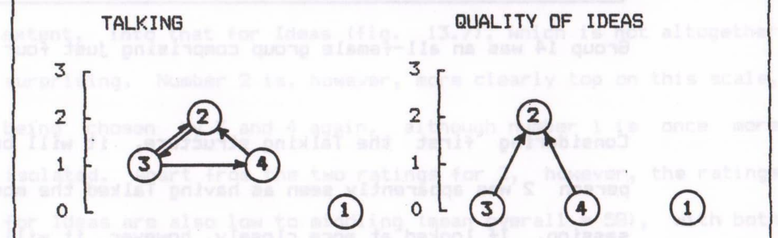


Figure 13.8. FIRST CHOICE SOCIOGRAMS FOR GROUP 14. (N = 4)

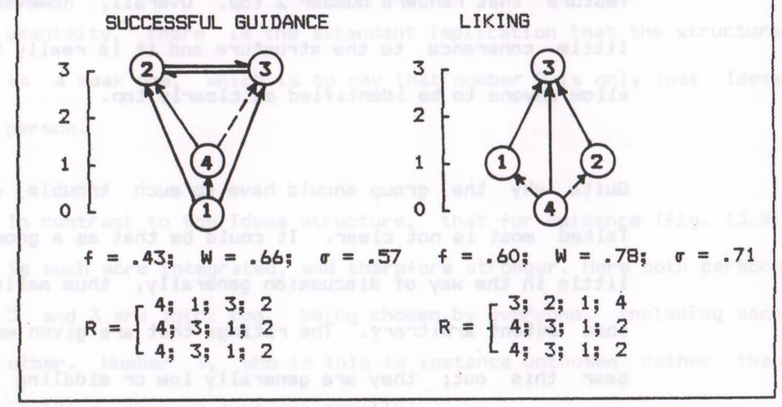
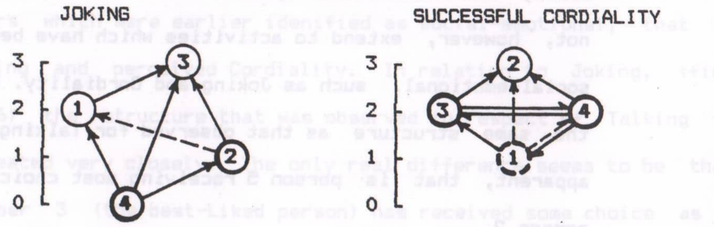


Figure 13.9. FIRST CHOICE SOCIOGRAMS FOR GROUP 14. (N = 4)



Group 14 was an all-female group comprising just four members.

Considering first the Talking structure, it will be seen that person 2 was apparently seen as having Talked the most during the session. If looked at more closely, however, it will be seen that the structure is actually very weak. Apart from person 1, who is an isolate in this sociogram, the group's choices tend to form a chain. In this case person 4 chooses 2; 2 chooses 3; and 3 chooses 4. It is true that 3 and 2 choose each other, and it is this feature that renders number 2 top. Overall, however, there is little coherence to the structure and it is really too weak to allow anyone to be identified as clearly top.

Quite why the group should have so much trouble deciding who Talked most is not clear. It could be that as a group there was little in the way of discussion generally, thus making ratings to some extent arbitrary. The ratings that are given would seem to bear this out; they are generally low or middling (mean rating

overall = 59) with only 3 and 4 apparently perceiving any clear differentiation in the way of activity. It is for these two that number 2 Talked most, but number 2 herself saw very little difference in activity, the mean rating that she gave being 54 (standard deviation = 3.74). Beyond this the raw ratings are really of little further help, but the actual levels of activity, which as noted may have been low, can be checked at some future time using behavioural data from the audio-visual tapes.

The weakness of the Talking structure is carried over, to some extent, into that for Ideas (fig. 13.7), which is not altogether surprising. Number 2 is, however, more clearly top on this scale, being chosen by 3 and 4 again, although number 1 is once more isolated. Apart from the two ratings for 2, however, the ratings for Ideas are also low to middling (mean overall = 58), with both persons 1 and 2 apparently not being very impressed with anyone's Ideas (mean ratings given by 1 = 50; S.D. = 4.24; given by 2 = 53; S.D. = 2.87). In view of this it is difficult to interpret the structure. It seems best to conclude that number 2 is indeed the Ideas person for the group, but in view of the apparent lack of unanimity, there is the attendant implication that the structure is a weak one, which is to say that number 2 is only just Ideas person.

In contrast to the Ideas structure, that for Guidance (fig. 13.8) is much more integrated, and therefore stronger. Here both persons 2 and 3 are joint top, being chosen by everyone, including each other. Number 1, who in this is instance unchosen rather than isolated, chooses everyone equally.

The stronger structure for Guidance, in comparison with that for Ideas, is in apparent contrast with the general trend observed many times so far. But it is only apparent. Although the Guidance structure in this group is stronger, because there are more choices made, it is nevertheless more diffuse (the values for Ideas and Guidance respectively are: 0.67 and 0.43). Thus the structure for Guidance is more distributed than that for Ideas, thus following a trend noted before.

With respect to Liking (fig. 13.8), it is person 3 who emerges as most chosen, being selected by all the other members. Number 4 is unchosen, although from the ratings she has received she is no more not-Liked, or Disliked than everyone else. Generally ratings are middling (mean overall = 57), and even number 3 receives only middle range ratings apart from the rating she receives from number 4 (56; 58; 74). On the other hand, no-one in the group actively Dislikes anyone else (mean rating overall for Disliking = 92, with no rating less than 79). Overall the impression is that the group members are largely indifferent to one another; number 4 (who gave the higher ratings) commented: "I don't really know them".

The Joking structure (fig. 13.9) indicates that number 3 is most chosen, seconded by number 1, which may account for her status on Liking.

The Cordiality structure, although showing number 2 as top, is to some extent a distributed one. Everyone is chosen at least once, and there is a strong mutual choice between 3 and 4.

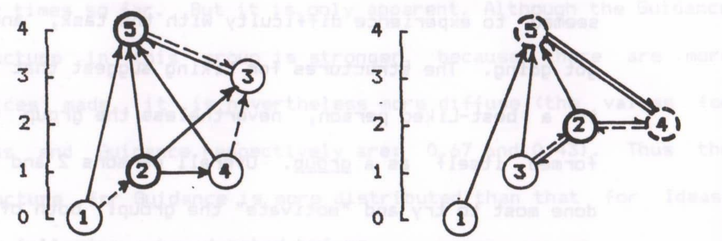
This is a difficult group to comment on. From the structures relating to Talking and Ideas, the impression is that the group seemed to experience difficulty with the task, and never really got going. The structures for Liking suggest that although there is a best-Liked person, nevertheless the group never properly formed itself as a group. Overall persons 2 and 3 seem to have done most to try and "motivate" the group: both of them as discussion Guides; number 2 as Ideas person and the most Cordial member; and number 3 (seconded by number 1) by contributing most Joking. But it seems unlikely that the group ever really moved from the stage of simply joking their way through the discussion without really achieving anything. This, of course, is all highly inferential, although much of it can be checked using behavioural data.

In terms of role differentiation, insofar as the best-Liked person was not the Ideas person (although she was joint discussion Guide) this group does provide some evidence in terms of Ideas and Liking. But the evidence can hardly be claimed to be strong. First, the Ideas structure is too weak to claim with any confidence that there really was an Ideas person. Second, the Liking structure, although a fairly focussed one, does not lend itself to the view that the person best-Liked was anything more than the best-Liked member of a group whose members were generally indifferent to one another.

3.5. GROUP 15.

Group 15 was also a completely female group, comprising 5 members.

Figure 13.10. FIRST CHOICE SOCIOGRAMS FOR GROUP 15. (N = 5)

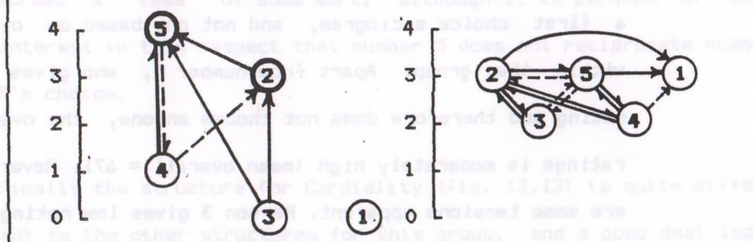


$$R = \begin{bmatrix} 5;\ 3;\ 2;\ 4;\ 1 \\ 5;\ 3;\ 2;\ 4;\ 1 \\ 5;\ 3;\ 2;\ 4;\ 1 \end{bmatrix} \qquad R = \begin{bmatrix} 5;\ 4;\ 3;\ 2;\ 1 \\ 5;\ 4;\ 3;\ 2;\ 1 \\ 5;\ 4;\ 3;\ 2;\ 1 \end{bmatrix}$$

Considering first the sociogram for Talking (fig. 13.10) for group 15, it will be seen that two people (5 and 3) emerge as top, in a pattern that has become familiar, namely person 5 is most chosen, receiving choices from the whole group, with person 3 being less chosen but nevertheless high. These two also choose each other.

The pattern, however, is not repeated in the Ideas structure. Person 5 is most chosen, again receiving choices from all other group members, but this time number 3 is chosen only once. This suggests that whatever activity number 3 was engaging in, it was not seen by the rest of the group in terms of good Ideas. It is clear from the structure that number 5 should be identified as the Ideas person for the group, but it should also be noted that the structure is not focussed on her alone. To some extent the structure is distributed, so that although number 5 may have made the greatest Ideas input, nevertheless important contributions were made by other members as well, notably numbers 2 and 4.

Figure 13.11. FIRST CHOICE SOCIOGRAMS FOR GROUP 15. (N = 5)



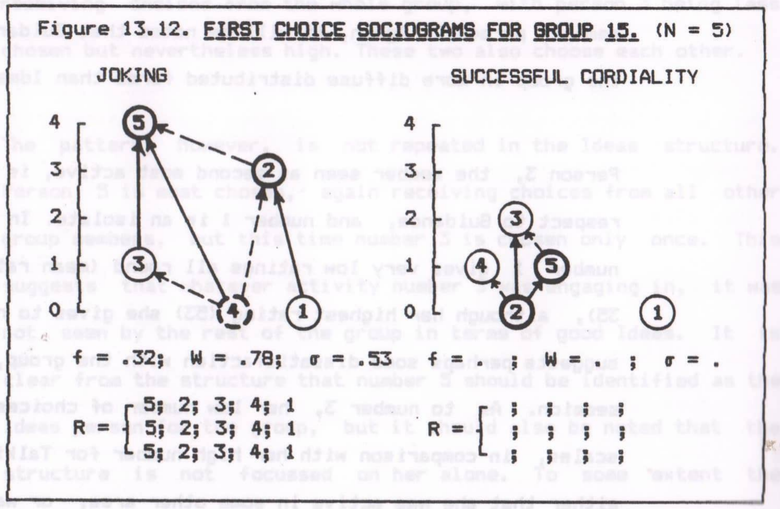
$$R = \begin{bmatrix} 5;\ 2;\ 3;\ 4;\ 1 \\ 5;\ 2;\ 4;\ 3;\ 1 \\ 5;\ 3;\ 4;\ 2;\ 1 \end{bmatrix} \qquad R = \begin{bmatrix} 2;\ 5;\ 3;\ 4;\ 1 \\ 5;\ 1;\ 4;\ 3;\ 2 \\ 3.5;\ 2;\ 5;\ 3.5;\ 1 \end{bmatrix}$$

In terms of Guidance (fig. 13.11), number 5 once more appears as top, although less clearly than in Ideas. This time she receives fewer choices, and she is more obviously seconded by another member, person 2. Again, it will be noted that Guidance is seen by the group in more diffuse distributed forms than Ideas.

Person 3, the member seen as second most active, is unchosen with respect to Guidance, and number 1 is an isolate. In point of fact number 1 gives very low ratings all round (mean rating given = 35), although her highest rating (53) she gives to number 5. This suggests perhaps some dissatisfaction with the group, or the group session. As to number 3, her low number of choices on the task scales, in comparison with her high number for Talking, suggests either that she was active in some other area, or was, in Bales' terms, an overactive deviant.

The Liking structure for this group (fig. 13.11) suggests a fairly well integrated group. Out of 10 possible mutual choices there are 5 apparent, which is interesting because, as noted before, this is a first choice sociogram, and not one based on overall Liking within the group. Apart from number 1, who gives a uniform 53 rating and therefore does not choose anyone, the overall level of ratings is moderately high (mean overall = 67). Nevertheless there are some tensions apparent. Person 3 gives low ratings to number 1 (46) and to 4 (53). 4, in her turn gives number 3 a middling rating (55). On the other hand there are no serious examples of Disliking; the mean overall rating on question 8 was 80, with no examples of low scores. From the shape of the structure, however, and the level of focus (f = 0.17) it is clear that there is no-one within this group who can be identified as the best-Liked group member.

Figure 13.12. FIRST CHOICE SOCIOGRAMS FOR GROUP 15. (N = 5)



The Joking structure (fig. 13.12) repeats to some extent the structure for Guidance (fig. 13.11). Person 5 is chosen by every-

one except number 1 as the person who did most Joking, seconded, once again, by number 2. This suggests that 5 and 2 may have formed a "team" of some sort, although it is perhaps of some interest in this respect that number 5 does not reciprocate number 5's choice.

Finally the structure for Cordiality (fig. 13.12) is quite different to the other structures for this group, and a good deal looser. It is so different, in fact, that it is difficult to believe that it is from the same group. There are few choices made, and the majority of these come from one person (number 2). Otherwise the only choice made is for number 3 from number 5, and number 1 appears as an isolate, as she did in relation to Guidance (fig. 13.11). Overall, there is really no structure to speak of for Cordiality, and although number 3 is most chosen, this is really only marginal.

The raw scores for Cordiality seem to be remarkably mixed. Person 2 makes a firm choice for herself, and gives high ratings to numbers 3 and 5 (102). She also makes a second choice of number 4 (96), but apparently dismisses number 1 (who is an isolate in this structure) with a very low rating (6). Person 1, in her turn, chooses no-one, giving a uniform rating of 53. Persons 3 and 4 give similarly middle range ratings (mean rating given by number 3 = 54; S.D. = 1.87; number 4 = 47.5; S.D. = 13.07). Person 5 apparently perceived Cordiality only in herself and number 3; for the rest she gave ratings of less than 48. This would suggest that whatever the other features of the interactions of this group, Cordiality was certainly not one of them. To the extent that

Cordiality can be taken as a measure of perceived friendliness, as opposed to Likeability, this would further suggest that the group's interactions were not friendly ones.

Overall, there is one person within this group (person 5) who appears prominently in relation to all the sociometric criteria except Cordiality. She is to some extent seconded by another group member (number 2) on Ideas, Guidance and Joking, although she is seconded by person 3 on Talking (who appears marginally most chosen on Cordiality). With respect to Liking, person 5 appears prominently, but she cannot be identified as the best-Liked group member because the structure is a diffuse and distributed one. With respect to Cordiality, although person 3 appears as marginally most chosen, the structure is weak, and therefore no-one is clearly chosen as most Cordial.

In relation to the role differentiation hypothesis, this group lends little corroboration. If anything the group tends more towards a dual distributed Great Person structure. This is not a firm description, however, because the Liking structure does not allow anyone to be identified as best-Liked, and the the weak Cordiality structure does not suggest a great deal of Cordiality within the group.

3.6. GROUP 16.

Group 16 comprised 6 women and one man (person 4). The latter is designated on the following diagrams with ^.

Figure 13.13. FIRST CHOICE SOCIOGRAMS FOR GROUP 16. (N = 7)

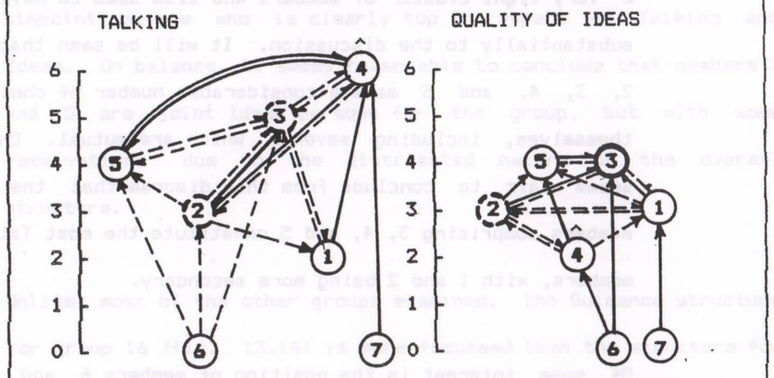
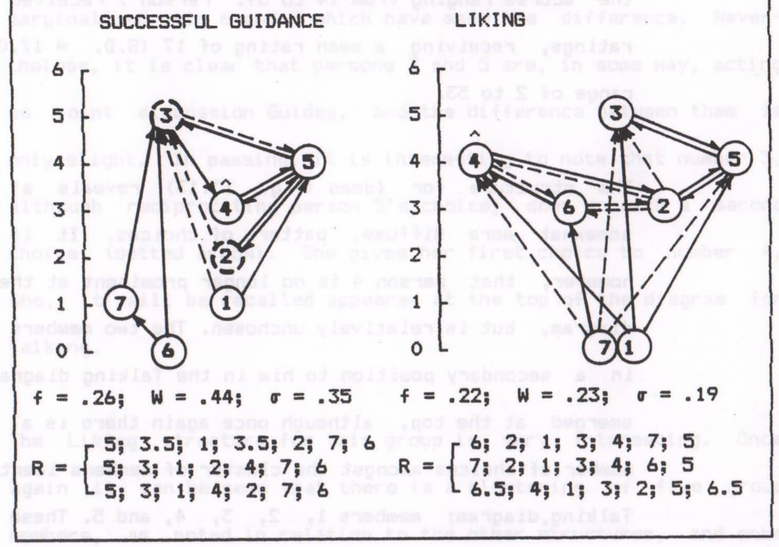


Figure 13.14. FIRST CHOICE SOCIOGRAMS FOR GROUP 16. (N = 7)



From the evidence of the Talking sociogram (fig. 13.13), group 16 seems to have been a highly active group in general. Person 4

appears to have been the most Talkative, but there is nevertheless a very tight cluster of members who also seem to have contributed substantially to the discussion. It will be seen that persons 1, 2, 3, 4, and 5 make a considerable number of choices amongst themselves, including several which are mutual. On balance it seems fair to conclude from this diagram that the cluster of members comprising 3, 4, and 5 constitute the most Talkative group members, with 1 and 2 being more secondary.

Of some interest is the position of members 6 and 7, who are unchosen. In view of the general pattern of the structure this would seem to suggest that they were relatively inactive, and this, indeed is borne out by the ratings they each received. Person 6 received a mean rating of only 31 (S.D. = 14.87), with the scores ranging from 14 to 59. Person 7 received even lower ratings, receiving a mean rating of 17 (S.D. = 17.08), with a range of 2 to 53.

The structure for Ideas (fig. 13.13) reveals a similar, if somewhat more diffuse, pattern of choices. It is noteworthy, however, that person 4 is no longer prominent at the top of the diagram, but is relatively unchosen. The two members who appeared in a secondary position to him in the Talking diagram have now emerged at the top, although once again there is a considerable number of choices amongst the cluster of members identified in the Talking diagram; members 1, 2, 3, 4, and 5. These five seem to have formed themselves into a relatively close knit group, which has excluded numbers 6 and 7.

On the basis of these two diagrams, it is already difficult to pinpoint anyone who is clearly top in respect of Talking and Ideas. On balance, it seems reasonable to conclude that members 3 and 5 are joint Ideas persons for the group, but with some reservations due to the distributed nature of the overall structure.

Unlike most of the other groups examined, the Guidance structure for group 16 (fig. 13.14) is more focussed than the structure for Ideas (the values of f for Ideas and Guidance respectively are 0.17 and 0.26). It can be seen that 3 and 5 are once more at the top, but with 3 marginally ahead. From the choice pattern, however, it seems that person 5 receives more first choices from the clique identified earlier, and it is the choices made by the marginalised pair 6 and 7 which have made the difference. Nevertheless, it is clear that persons 3 and 5 are, in some way, acting as joint discussion Guides, and the difference between them is only slight. In passing, it is interesting to note that number 3, although reciprocating person 5's choice, does so with a second choice (dotted arrow). She gives her first choice to number 4, who, it will be recalled appeared at the top of the diagram for Talking.

The Liking structure for this group is very interesting. Once again it can be seen that there is a clustering of five group members, as noted in relation to the other structures, and once again two are unchosen. The personnel, however, are different. Person 6 forms part of a small group comprising also numbers 2 and

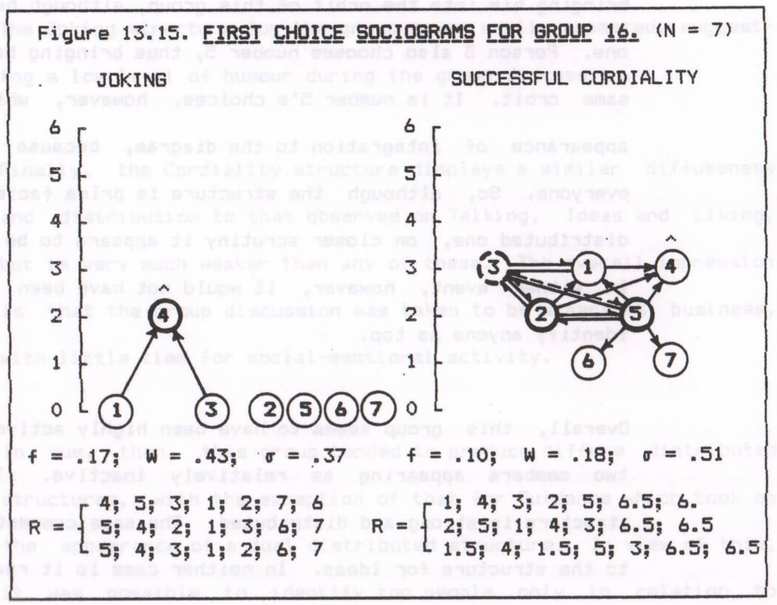
4, who all choose each other. So, although she is apparently inactive within the group, she is nevertheless fairly well Liked. Person 7, who is the other member consistently unchosen on the other scales, remains unchosen on Liking as well. Person 1, however, is a surprise. Although not high in the other structures, she was nevertheless not unchosen as she is on Liking.

When the raw data are examined for Liking ratings, some interesting tensions seem to emerge. Person 1 gives a low rating to number 6 (10) and middle range ratings to 2 and 7. To the rest she gives a rating of 80. Person 2 gives ratings which seldom rise above the middle range (mean = 57; S.D. = 3.21), and the same is true for person 3 (mean rating = 53; S.D. = 4.27). Person 4 is very definite in his Likes, rating number 2 at 77 and number 6 at 72, but the rest at less than 53. The same is true of person 5, who gives high ratings to numbers 2 and 3 (67 and 69), but middle to low ones for everyone else (all less than 51). Person 6 seems to Like everyone moderately well, except number 5, to whom she gives a rating of only 47. Person 7 rates everyone moderately highly, although she gives ratings of only 53 to 1 and 2.

When the Disliking raw scores are examined with these tensions in mind, it appears that person 1 definitely Dislikes number 6 (rating = 18); person 3 definitely Dislikes numbers 4 and 6 (ratings = 45; 48); person 4 definitely Dislikes number 5 (rating = 16); and person 6 definitely Dislikes number 5 (rating = 39). Number 7, by these scores, is not particularly Disliked by anyone, despite her consistently unchosen status.

On the basis of this information, it appears that the clique at the top of the diagram is, in point of fact, a series of three overlapping cliques, whose points of contact are persons 2 and 5. Taking this into account, and also considering the low value of focus (f = 0.22), it is not possible to identify anyone as best-Liked, although person 3 is marginally at the top of the diagram. More important, however, is the suggestion that the group is not as cohesive as the diagram implies, although to all intents and purposes, given the amount of choosing within the diagram it seems fair to conclude that the group has sufficient cohesion to warrant the supposition that it is not damagingly fragmented.

Figure 13.15. FIRST CHOICE SOCIOGRAMS FOR GROUP 16. (N = 7)



From figure 13.15, it appears that there was not a lot of humour during the group discussion. Persons 1 and 3 apparently saw some Joking from person 4, who considered himself to have been Joking, but the rest of the group clearly failed to perceive it. In which

case it seems most reasonable to suggest that there really is no-one within this group seen as the Joker.

Finally, the diagram showing the Cordiality structure (fig. 13.15) is a fairly diffuse one. It is not, however, a very strong structure, as can be seen if it is considered that the highest number of choices is only 3, that is half-way up the scale on the left. In point of fact, there is a small number of members on the upper left of the structure, who seem to have formed into something like a clique (although without maximum mutual choice). These are persons 1, 2, and 3. 1 and 2 also choose number 4, thus bringing him into the orbit of this group, although he chooses no-one. Person 3 also chooses number 5, thus bringing her within the same orbit. It is number 5's choices, however, which lend the appearance of integration to the diagram, because she chooses everyone. So, although the structure is prima facie a strong if distributed one, on closer scrutiny it appears to be much weaker. In either event, however, it would not have been possible to identify anyone as top.

Overall, this group seems to have been highly active, with only two members appearing as relatively inactive. The Talking structure is strong and distributed. The same comments also apply to the structure for Ideas. In neither case is it really possible to pinpoint anyone who is clearly top. For Guidance, however, two members (3 and 5) appear to be taking the part of joint discussion Guide.

The Liking structure, as it was the case with Talking and Ideas, is diffuse and distributed, with only two members unchosen. On closer scrutiny, however, it appears that the structure as it appears in figure 13.14 conceals a series of three overlapping cliques. The apparent integration of the group conceals some interesting tensions, although it is unlikely that these are sufficiently strong to undermine seriously the cohesion of the group. In view of some of the results from the multiple session groups, it would have been interesting to have followed this group through several more sessions to see whether the tensions would have increased or disappeared.

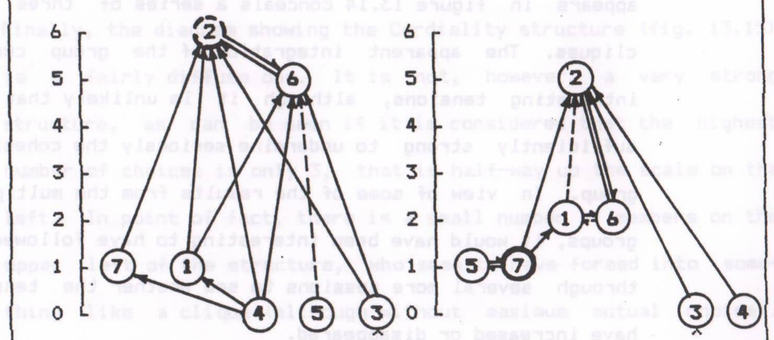
The Joking structure for the group never really appeared, suggesting a low level of humour during the group discussion.

Finally, the Cordiality structure displays a similar diffuseness and distribution to that observed on Talking, Ideas and Liking, but is very much weaker than any of these. The overall impression is that the group discussion was taken to be a serious business, with little time for social-emotional activity.

In sum, then, this group tended to produce diffuse distributed structures, with the exception of that for Guidance which took on the appearance of a dual distributed structure. In view of this, it was possible to identify top people only in relation to Guidance, and therefore, in terms of the role differentiation hypothesis, there was, strictly speaking, only one role which was not distributed amongst the group's members - discussion Guide.

3.7. GROUP 17.

Figure 13.16. FIRST CHOICE SOCIOGRAMS FOR GROUP 17. (N = 7)

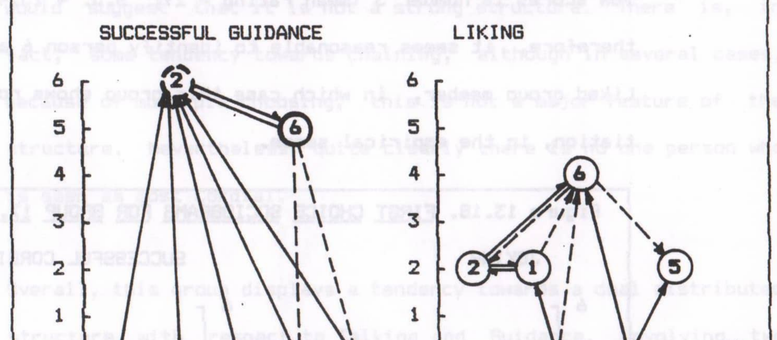


Group 17 comprised six women and one man (person 3), who will be identified by ^.

The diagram for Talking (fig. 13.16) clearly shows a dual distributed structure, with one person (number 2) at the top, seconded by another group member (number 6). This structure is not, however, carried over to Ideas (also fig. 13.16). Here it will be seen that person 2 has emerged more clearly at the top, with number 6 much lower down in terms of choices. In terms of this structure, number 2 is chosen by everyone except number 5, who chooses number 7. It is interesting to note that person 3 (the male participant), is generally rejected by the other group members, receiving low ratings overall on Ideas (mean rating received = 16.5; S.D. = 4.11). This may be due to relative inactivity on his part, since

his ratings for activity are also very low (mean rating received = 7.33; S.D. = 4.68).

Figure 13.17. FIRST CHOICE SOCIOGRAMS FOR GROUP 17. (N = 7)

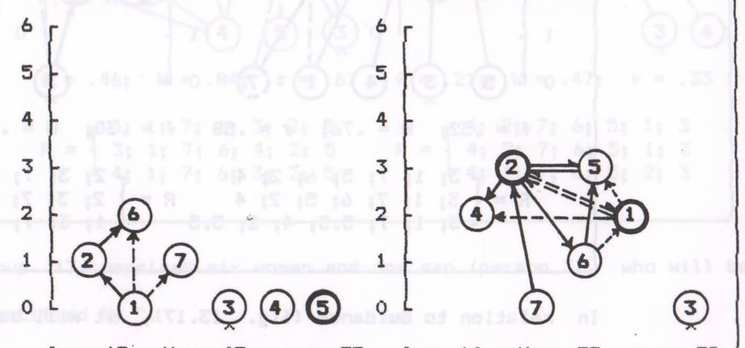


In relation to Guidance (fig. 13.17), it will be seen that the structure derived from the Talking scale is repeated. Person 2 is again at the top, but very clearly seconded by number 6.

The same structure is reflected to some extent by that for Liking (also fig. 13.17), although in this case the structure is much weaker, and person 6 appears at the top. The dissenters are person 7, who is an isolate, and person 5, who chooses no-one. Persons 3 and 4 are also unchosen. In point of fact the general level of ratings on Liking are low (overall mean = 52), and with the exception of persons 2 and 6, most members give and receive low to middle ratings. Person 6 receives overall high ratings except from number 4 who gives a low rating to everyone. Person 2 receives

mixed ratings; from 1 and 6 she receives high scores (83 and 82 respectively), but from the rest she receives only low or middle range scores (29 to 56). The only member to receive consistently low scores is number 3 (mean rating = 29; S.D. = 13.43). Overall, therefore, it seems reasonable to identify person 6 as the best-Liked group member, in which case this group shows role differentiation, in the empirical sense.

Figure 13.18. FIRST CHOICE SOCIOGRAMS FOR GROUP 17. (N = 7)



$$R = \begin{bmatrix} 5.5; & 1; & 7; & 4; & 5.5; & 2; & 3 \\ 5; & 1; & 7; & 6; & 4; & 3; & 2 \\ 4; & 1; & 7; & 6; & 5; & 2; & 3 \end{bmatrix} \qquad R = \begin{bmatrix} 4; & 1; & 7; & 5; & 2; & 3; & 6 \\ 4; & 1; & 7; & 5; & 3; & 2; & 6 \\ 4; & 1; & 7; & 5; & 3; & 2; & 6 \end{bmatrix}$$

The Joking structure for this group (fig. 13. 18) is really not developed at all, and is largely the product of the ratings of one member only - number 1. The only other person who perceives any Joking at all is number 2, although it is interesting to note that they both choose number 6 (the best-Liked group member).

Finally the Cordiality structure once more places number 2 at the top, although jointly with number 5. This is curious; number 5

seems to have come from nowhere, not being particularly highly chosen on any of the other scales. The structure is fairly well integrated, although no-one receives more than 3 choices which would suggest that it is not a strong structure. There is, in fact, some tendency towards chaining, although in several cases, because of multiple choosing, this is not a major feature of the structure. Nevertheless, quite clearly there is no one person who is seen as most Cordial.

Overall, this group displays a tendency towards a dual distributed structure with respect to Talking and Guidance, involving two members 6 and 2. A similar structure emerged for Ideas, although with number 2 very clearly at the top, and again with respect to Liking but with number 6 at the top. In this case, therefore, is an example of role differentiation in the Bales' empirical sense. The role differentiation does not, however, extend to Joking, where there was really no structure at all, or to Cordiality where there was a weak distributed structure. In neither of these cases was it possible, therefore, to identify anyone clearly top.

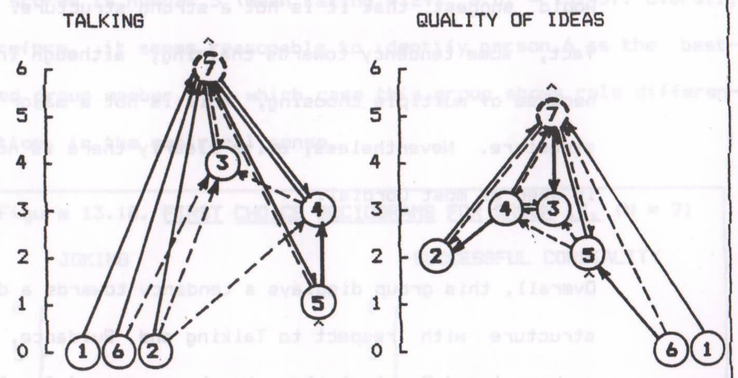
3.8. GROUP 18.

Group 18 comprised five women and two men (numbers 5 & 7). These last will be distinguished on the following diagrams by the truncated alchemical symbol for Mars, and therefore are designated by a ^.

The Talking sociogram for this group (fig. 13.19) suggests that person 7 is clearly the most active group member. It will be seen,

however, that the structure is to some extent distributed (f = 0.43), and two other members also appear prominently (3 & 4).

Figure 13.19. FIRST CHOICE SOCIOGRAMS FOR GROUP 18. (N = 7)



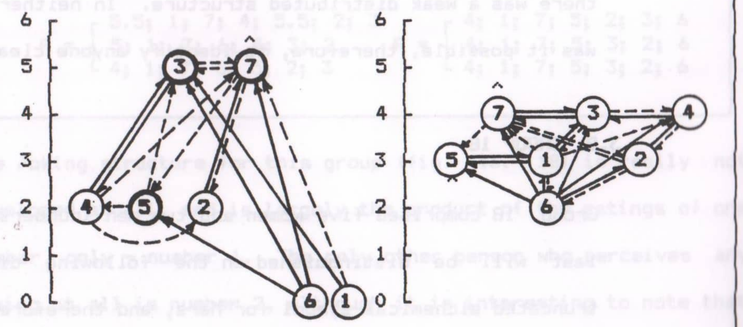
TALKING: f = .43; W = .81; σ = .58

$$R = \begin{bmatrix} 6; & 5; & 2; & 3; & 4; & 7; & 1 \\ 6; & 5; & 2; & 3; & 4; & 7; & 1 \\ 6; & 5; & 3; & 2; & 4; & 7; & 1 \end{bmatrix}$$

QUALITY OF IDEAS: f = .28; W = .61; σ = .41

$$R = \begin{bmatrix} 6; & 5; & 2; & 3; & 4; & 7; & 1 \\ 6; & 5; & 3; & 2; & 4; & 7; & 1 \\ 6; & 5; & 3; & 2; & 4; & 7; & 1 \end{bmatrix}$$

Figure 13.20. FIRST CHOICE SOCIOGRAMS FOR GROUP 18. (N = 7)



SUCCESSFUL GUIDANCE: f = .26; W = .51; σ = .33

$$R = \begin{bmatrix} 6; & 5; & 2; & 3; & 4; & 7; & 1 \\ 6; & 5; & 2; & 3; & 4; & 7; & 1 \\ 6; & 5; & 2; & 3; & 4; & 7; & 1 \end{bmatrix}$$

LIKING: f = .12; W = .16; σ = .10

$$R = \begin{bmatrix} 5; & 7; & 1; & 4; & 3; & 6; & 2 \\ 3; & 7; & 1; & 4; & 5; & 6; & 2 \\ 3; & 6; & 1; & 4; & 5; & 7; & 2 \end{bmatrix}$$

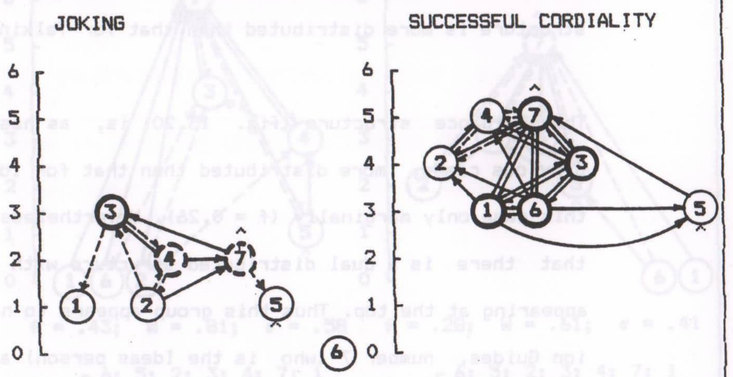
The structure observed on Talking is repeated to some extent in the diagram for Ideas (also fig. 13.19). On this diagram person 5 still appears at the top, but with fewer choices received. In point of fact everyone chooses number 7 except number 3. 3 and 4 once again appear prominently in the diagram, and overall the structure is more distributed than that for Talking (f = 0.28).

The Guidance structure (fig. 13.20) is, as has been noted in previous cases, more distributed than that for Ideas, although in this case only marginally (f = 0.26). Nevertheless, it can be seen that there is a dual distributed structure with persons 7 and 3 appearing at the top. Thus this group appears to have two discussion Guides, number 7 (who is the Ideas person) and number 3, who is also high on Ideas and Talking.

The Liking structure for this group (fig. 13.20) is very distributed (f = 0.12), and is such that no one person can legitimately be regarded as best-Liked. It is interesting to note, however, that numbers 7, 3, and 4, who were identified earlier as the most active group members, all appear as equally chosen at the top of the diagram. The structure is characterised by a high number of mutual choices (7 out of a possible 21), and everyone is chosen by at least two other members. Number 6 chooses everyone, but the structure does not rely for its integrated appearance on these choices alone. Number 6 is, nevertheless, the least chosen member, but she is neither, in terms of the raw scores, not-Liked nor Disliked (mean rating received on Liking = 70; S.D. =16.25; mean rating received on Disliking = 91; S.D. = 17.1). Overall, the ratings given and received within this group are comparatively

high (overall mean rating = 75), with no low ratings at all. This suggests a well integrated group with no important negative tensions.

Figure 13.21. FIRST CHOICE SOCIOGRAMS FOR GROUP 18. (N = 7)



f = .15; W = .72; σ = .47 f = .15; W = .21; σ = .47

$$R = \begin{bmatrix} 5; & 6; & 1; & 3; & 4; & 7; & 2 \\ 5; & 6; & 3; & 2; & 4; & 7; & 1 \\ 5; & 6; & 2; & 3; & 4; & 7; & 1 \end{bmatrix} \qquad R = \begin{bmatrix} 5.5; & 4; & 2; & 1; & 5.5; & 7; & 3 \\ 4; & 6; & 3; & 1; & 7; & 5; & 2 \\ 5; & 4; & 2.5; & 1; & 6; & 7; & 2.5 \end{bmatrix}$$

The structure for Joking (fig. 13.21), in comparison with the is other structures considered, relatively weak. Persons 3, 4, and 7 still appear at the top, although with number 3 most chosen this time, but they all appear lower down in the diagram than previously. This means that there were fewer choices made overall, and indeed this can be seen from the diagram. There is some tendency towards chaining, and the overall impression is that the structure is a loose one, with one person appearing as an isolate (number 6). This suggests that there was little perceived Joking in the group, and the raw scores bear this out. The overall mean rating given and received was 43, which is relatively low. Most scores are below 50, although one or two reach into the 70s (5's self

rating = 75; 4 to 3 = 71; 4 to 7 = 71; 7 to 3 = 72; 7 to 5 = 71). In view of these scores, it is debateable whether any of the group members can be considered as top in relation to Joking, although it seems resonable to conclude that 3, 4, and 7 jointly provided the most of what little Joking there appears to have been.

The Cordiality structure for this group (fig. 13.21) is highly distributed (f = 0.16), with number 7 again appearing at the top, but this time jointly with number 4. The structure again is characterised by a high number of mutual choices (9 out of a possible 21), and everyone is chosen at least 3 times. Thus, although it is reasonable to conclude that numbers 4 and 7 are seen as overall most Cordial, it must also be acknowledged that they are only marginally so in relation to the overall structure.

Overall, it seems clear that the trio 3, 4, and 7 are somehow jointly making the major contributions to the group effort. These three appear prominently in all the structures; person 7 is seen as most Talkative, and as the Ideas person, but in both cases he is closely acompanied by numbers 3 and 4. Numbers 7 and 3 appear as joint discussion Guides, and the three of them are most chosen in terms of Liking. Persons 7 and 4 are jointly top in regard to Cordiality. Two of these structures, however, are widely distributed (Liking and Cordiality), and in both cases, therefore, it is not possible to claim that any of these three are clearly top in relation to the rest of the group. Finally, the Joking structure is comparatively loose, and although once again it is the same three members who appear prominently, with number 3 marginally

most chosen, it is not possible to claim that anyone is clearly top because there are so few choices made, and the structure is therefore a weak one, as well as being comparatively distributed.

This group does not display role differentiation in Bales' empirical sense. What role differentiation there appears to be is once again focussed in terms of Ideas and Guidance. The structure tends towards a Great Person structure, but it cannot be concluded that it definitely is a Great Person structure because of the complex dynamics which exist between the three members 3, 4, and 7.

4. SUMMARY AND CONCLUSIONS.

There were three groups in this sample (12, 13, & 17) which showed some evidence of role differentiation in the empirical sense, that is, where the Ideas person was not best-Liked. In no case, however, was the tendency strong, and in no case did it extend further to include scales other than Liking.

Group 12 developed strongly differentiated structures in respect of Talking and Ideas, with the same person top on both. The Guidance structure had the same person as top, but seconded by another member. Overall, however, the structure was much weaker. The three remaining structures, Liking, Joking and Cordiality, were very weak.

Group 13 tended overall towards a Great Person structure, with one member who was prominent on all scales. This person was, however, seconded by another group member on Talking, Ideas and Guidance,

Joking and Cordiality, although was more clearly top on Guidance. There was a different person most chosen on Liking, although the Liking structure was a distributed one, and therefore no one person was clearly best-Liked.

Group 17 developed structures which were principally dual distributed structures. Talking and Guidance comprised structures which had one person at the top, but with a second member also very closely chosen. The Ideas structure also tended towards a dual distributed one, but one person was more clearly top than on Talking and Guidance, although it was the same person who was top on Talking and Guidance. Liking also tended towards a dual distributed structure, with the same two members who appeared prominently on Talking, Ideas and Guidance on top, but in this case the "subordinate" member on Talking, Ideas and Guidance was chosen marginally as best-Liked. This group did not develop strong structures in relation to Joking or Cordiality.

The remaining groups showed no evidence of role differentiation at all. Group 14 seemed to have some difficulty forming structures in relation to the task. The Talking and Ideas structures were both very weak. Guidance was stronger, but distributed between two members, one who was marginally top on Talking and Ideas, and the other who emerged as best-Liked. The best-Liked person also emerged as top in relation to Joking and Cordiality. Overall, however, this group seems not to have developed clear and strong structures of any kind, and it is therefore debateable whether they developed into a "group" at all, at least in relation to the measures used.

Group 15 had one member emerge prominently on all scales except Cordiality for which there was a weak structure. This person was, however, closely seconded by other group members on Talking, Guidance and Joking, although she emerged more clearly in relation to Ideas. The Liking structure was diffuse and distributed.

Group 16 developed strongly distributed structures on Talking, Ideas and Cordiality, and a dual distributed structure in relation to Guidance. Liking was also diffuse and distributed, but appeared to be composed of at least three overlapping cliques. The Joking structure was very weak.

Finally group 18 developed a dynamic tripartite structure involving three members who all appeared prominently across all scales. One person emerged as top on Talking and Ideas, but was seconded by two other members. One of these was joint top with the Ideas person on Liking, and the other was joint top with the Ideas person on Cordiality. In both these cases, however, the structures were also very highly distributed. The only weak structure from this group was that for Joking.

In sum, therefore, these groups provide only weak evidence that role differentiation, in Bales' terms ever occurs in identifiable small groups. What evidence there is is equivocal; it certainly presents a picture which is more complex than the simple proposition that two identifiable specialists emerge during group interactions, and further suggests that role differentiation, in the sense of identifiable task and social specialists, is not a common

feature of group dynamics at all. On the other hand, the evidence does not support Lewis's contention that role integration is the more common outcome either (Lewis, 1972).

PART 4: CONCLUSIONS.

CHAPTER 14: SUMMARY AND CONCLUSIONS.

1. INTRODUCTION.

Overall the results do not lend much corroboration to the proposition that role differentiation is a common structural form within small groups. The conclusion is the same whether role differentiation is considered in the empirical sense, described in terms of Ideas, Guidance and Liking, or the broader, more conceptual, sense described in terms of Task and Social role specialists. It has to be admitted, however, that there were considerable problems associated with the examinination of role differentiation in the broader sense, because the data upon which the analysis was to be based were not available, mainly due to measurement problems (see chapter 13, section 3.1). In the end, these problems constrained the choices available, and the analysis therefore continued as an examination of role differentiation in Bales' empirical sense.

Notwithstanding, there were some useful general points which have emerged from the analysis. In particular, the criticisms made in relation to the use of simple summary statistics to reflect group structures (see for example chapter 6, section 3.2) can be broadened and strengthened in the light of what has emerged using the approach adopted here. Furthermore, there have emerged some general points about the kind of structures which can and do emerge,

both in general and in relation to individual scales. For example, it was noted several times during the analysis that structures relating to Guidance were frequently less focussed than those for Ideas.

This chapter, then, will summarise the results described in the previous four chapters, in terms of role differentiation and in terms of general structures. It will conclude with some comments about measurement and analytical procedures, and make some recommendations for future research.

2. THE ROLE DIFFERENTIATION HYPOTHESIS.

The evidence in favour of the role differentiation hypothesis is very sparse in these studies. Admittedly role differentiation in relation to Ideas, Guidance and Liking occurred in seven of the groups observed in one form or another (see commentaries on groups 7, 9, 10, 11, 13, & 17 - See also table 14.1). In addition there was one group within which a dual form of role differentiation (two task and two social specialists) seemed to occur (group 2). Taken at face value, this suggests that role differentiation in relation to Ideas, Guidance and Liking, occurred in 44% of the groups studied. Nevertheless, in each case the evidence was equivocal. Put another way, **there was no single instance in which it was possible to say without qualification that role differentiation had occurred.**

The difficulties surrounding unqualified identification of role differentiation lie in the nature of the structures which were

observed within the groups. In each case one or other of the key scales (Ideas, Guidance or Liking) produced either a diffuse or a weak structure; in either case rendering identification of who came top either impossible or controversial.

In view of the complexity of the structures observed in the results, it can safely be concluded that the original framing of the role differentiation hypothesis is unhelpful. Bales consistently describes role differentiation in terms of single identifiable specialists, whether empirically in terms of Ideas, Guidance and Liking, or conceptually in terms of Task and Social Specialists (e.g. Bales, 1953, 1956, 1958; Bales & Slater, 1955; Slater, 1955). This assumes and implies that groups will develop in such a way that one person shoulders the responsibility for Task activities, perceived and enacted, and another different person shoulders the responsibility for Social-emotional activities, perceived and enacted. In other words, as originally framed the role differentiation hypothesis assumes and implies two co-ordinate, but separately identifiable, simple hierarchies within the group.

As originally examined and measured by Bales, the role differentiation hypothesis further assumes and implies that groups will develop in such a way that all group members will be simply and systematically ordered in relation to the different individual scales, with one person at the top, and the others ranged neatly in subordinate order below her or him. This was criticised by Shelley (1960) as unrealistic, and the evidence from the groups examined above supports to some extent Shelley's view; none of the groups were so neatly ordered. As presented the results above do

not lend themselves to any firm conclusions on the point, but levels of agreement amongst group members clearly varied substantially; what agreement there was appeared to focus on those who were either highly rated on the scales, or those who were low rated. In other words, there was some convergence in relation to those who stood out, or were salient, in some way. The middle ranks tended towards a random sorting. This, of course, is a proposition which can be examined in more detail in the future.

Table 14.1. SUMMARY TABLE OF RESULTS ON TALKING, IDEAS, GUIDANCE AND LIKING. (All groups; all sessions).

Group	Session	Talking	Ideas	Guidance	Liking
1	-	-	A(B,C)	A,B,D	A (weak)
2	-	-	A(B,C)	B(A)	A,B,D
3	-	-	A	A	A,B(C)
4	-	-	0 (weak)	0 (weak)	A(B,C,D,E) (weak)
5	-	-	A(B)	A,B (dist)	A(B,C)
6	-	-	A(B weak)	B,C	0 (weak)
7	-	-	A,B (weak)	A (weak)	C
8	-	-	A (low)	A (weak)	A,B (dist)
9	1	-	A(B)	B(A,C)	A (weak)
	3	-	A (weak)	C (dist)	D (dist)
10	1	-	A,B	A(B dist)	C (weak)
	2	-	D	B	0 (weak)
	3	-	D	A,D(B)	B,C,D (dist)
11	1	-	A(B,C) (dist)	A(B,C) (dist)	B(A,D) (dist)
	2	-	A(C dist)	A(C)	A,C (v.dist)
	3	-	A(B,C,D dist)	A,B (weak)	0 (v. dist)
12	-	A(B)	A	A,C (dist)	C,D (dist)
13	-	A(B)	A	A	C (dist)
14	-	0 (weak)	0 (weak)	A,B	B
15	-	A(B)	A	A(C)	A,B,C (dist)
16	-	A(B,C) (v. dist)	A(B) (v. dist)	B(A)	B (3 cliques)
17	-	A(B)	A	A(B)	B (weak)
18	-	A(B)	A(B,C)	A(B)	A,B,C (v. dist)

KEY: The letters within the rows refer to group members; for each group the same letter refers to the same person throughout. In addition, the following conventions have been observed:

A single letter in a column indicates an unequivocal choice of one person as top on the scale;

The form A(B) indicates that person A has been chosen top, but person B is also closely chosen on the scale;

A,B,C indicates that persons A, B, and C are equally chosen at the top of the scale;

A(B,C) indicates that person A is most chosen, but closely followed by persons B and C;

0 indicates that the structure was either too weak or too distributed to identify anyone as top;

(weak) indicates a weak structure; (dist) indicates a distributed structure.

The overwhelming impression from the results described above, and summarised in table 14.1., is that the original framing of the role differentiation hypothesis, and all the subsequent tests of it, imply a view of small groups which is rather too neat to capture anything like the full dynamic complexity that small groups seem to display. In the light of this, empirical and conceptual extensions of the hypothesis in terms of ATG, task legitimacy, and so on, which were earlier argued to be important, appear

to be premature. There is still considerable work to be done in terms of identifying and classifying the kinds of structures which do emerge in small groups, both within and across scales. Some of what follows is intended as a brief preliminary sketch aimed in this direction.

3. TASK ROLE DIFFERENTIATION.

One of the most interesting features of the results related to the relationship between the two task scales Ideas and Guidance. In several cases different people appeared as Ideas person and discussion Guide (groups 2, 6, 9 (sessions 1 and 3), 10 (session 2) and 16). In other words there appeared a form of role differentiation related to the task scales. The emergence of this arrangement, however, was not necessarily straightforward. For example, in group 16 (chapter 13, section 3.6) one person emerged as Ideas person, although the structure overall was highly distributed, seconded by another group member. In the Guidance structure these two swapped places, the subordinate member was chosen as the group's discussion Guide, and the Ideas person appeared to be acting as lieutenant. This suggests a complex dynamic arrangement, one that is certainly not adequately captured by any simple summary procedure that aims at identifying solely who received the highest mean rating, or mean ranking, or any equivalent formula.

Related to this form of role differentiation is that feature of the results which was commented on several times: Guidance structures seemed to be often more distributed than those for Ideas. For example, group 1 (chapter 10, section 3.1) developed an

Ideas structure with one person most chosen, although seconded by two others, and a Guidance structure that had three group members equally chosen on top, including the Ideas person. Similarly, group 5 (chapter 10, section 3.5) had one person most chosen on Ideas, seconded by another member, and a Guidance structure which had both members equally chosen on top, as well as being more distributed overall. Similar observations were made in 14 different cases, 60.87% of all cases observed, covering results from 11 groups (see tables 14.1 & 14.2).

Table 14.2. VALUES OF THE INDEX OF FOCUSEDNESS (f) FOR IDEAS, GUIDANCE AND LIKING. (All groups, all sessions).

	Group	IDEAS	GUIDANCE	LIKING
STUDY 1 (Chapter 10)	1	.36	.14	.26
	2	.36	.48	.14
	3	.56	.56	.16
	4	.07	.20	.16
	5	.40	.15	.32
	6	.30	.42	.14
STUDY 2 (Chapter 11)	7	.27	.33	.38
	8	1.00	.33	.27
STUDY 3 (Chapter 12)	9	.38	.28	.17
		.17	.23	.27
	10	.50	.43	.33
		.67	.48	.17
		.43	.33	.22
	11	.40	.36	.33
		.40	.38	.25
		.33	.33	.25
STUDY 4 (Chapter 13)	12	.33	.22	.20
	13	.42	.36	.29
	14	.67	.43	.60
	15	.44	.38	.17
	16	.17	.26	.22
	17	.21	.52	.30
	18	.28	.26	.12
	MEAN	**.40**	**.34**	**.25**
	S.D.	**.20**	**.11**	**.11**

These results are remarkably consistent with Bales' view that the activities denoted by Guidance are more generalised than those denoted by Ideas (e.g. Bales, 1958; Slater, 1955). As it turned out, however, although the effect seems to be fairly consistent, nevertheless it is not significant (Correlated T-test; T = 1.41, df = 22, p = 0.086 - Gustafson, 1984 - see table 14.3).

4. LIKING.

It was remarked earlier that the structures for Liking were by and large either weak or highly distributed. This scale produced weak structures in 8 cases; distributed structures in 13; and clearly differentiated structures in only two cases (groups 7 & 14 - see tables 14.1 and 14.2). In both of the last, however, either or both of Ideas and Guidance were weakly structured (see table 14.1), so even where it was possible to identify unequivocally a best-Liked person, it was still not possible to conclude without qualification that role differentiation had occurred.

The general diffuseness of the Liking structures is clearly illustrated by the values for the index of focusedness (f) given in table 14.2. Statistically the mean value for Liking differs significantly from those for Ideas and Guidance (see table 14.3), thus suggesting that this diffuseness is indeed a general feature of affective structures. This, once again, is remarkably similar to the conclusions drawn by Bales (e.g. Bales & Slater, 1955; Slater, 1955), in that Liking here appears as a separated dimension. But, perhaps the nature of the figures gives some clue as to why Bales consistently found Liking to be independently variable.

Table 14.3. LEVELS OF SIGNIFICANCE FOR DIFFERENCES BETWEEN IDEAS GUIDANCE AND LIKING ON VALUES OF THE INDEX OF FOCUSEDNESS (f).

(Correlated T-test)

	GUIDANCE	LIKING
IDEAS	T = 1.41; p = 0.09, ns	T = 3.59; p < 0.001
GUIDANCE		T = 2.91; p < 0.001

Where structures are weak or distributed, it follows that any simple summary vectors, such as those that Bales used in his analysis, are likely to be as much the product of random or near random numerical effects as they are to be reflections of the structure of the data. An examination of the summary vectors reproduced alongside the sociograms will reinforce the point. It will be seen that it is in cases where the structures are weak or diffuse that they demonstrate the most erratic differences, and it is this which suggests near randomness. Correlation coefficients calculated on the basis of random assortments of numbers ought to be relatively low (Blalock, 1979; Connor & Morrell, 1967; Guilford & Fruchter, 1978; Moore, 1980; Siegel, 1956), as they were in Bales results, as well as those of other researchers (e.g. Burke, 1967, 1968, 1972; Gustafson & Harrell, 1970). So, perhaps once again, the explanation for an important part of Bales results lies more in the direction of statistical artifact than in social psychological process.

In some ways the diffuseness of the Liking structures is not surprising. Bales assumed, or appeared to assume, that Liking was an outcome solely of group interactions, related in important and particular ways to the task activities of the group. But clearly

this is not necessarily always, or even often, the case (Mulder et al., 1964). Liking can be an outcome of many factors, some of which will be extraneous to what occurs in the group; physical attractiveness is an obvious example. The diffuseness does, however, render the identification of role differentiation in Bales' terms difficult or impossible, because, as described and operationalised by Bales, the hypothesis relies on the straightforward identification of someone who is top on each scale, Liking in particular.

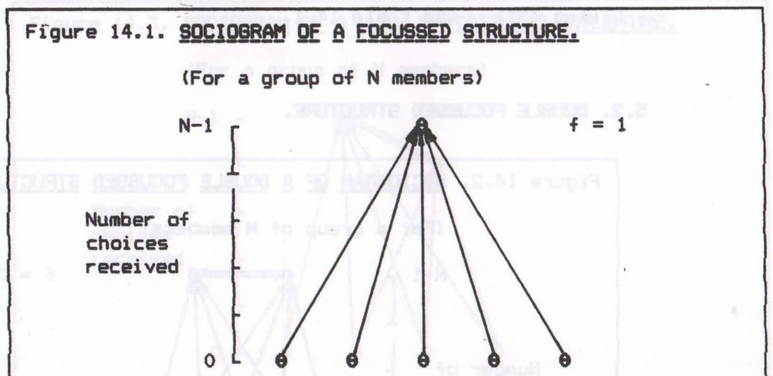
5. STRUCTURES WITHIN SCALES.

The analytical procedures adopted here, and the results which were derived from them, demonstrate two things. First it is not always possible to identify clearly someone who is top on a scale, and second, when the structures which emerge are examined, they are frequently more interesting, and appear to be more dynamic, than those which emerge when it is assumed that a simple hierarchy will appear. In other words, the approach adopted here, because it abandons the assumption that a group will order itself, in relation to particular scales, into a simple hierarchy, and therefore abandons the use of simple summary vectors to summarise emergent structure, has demonstrated that the structures which do emerge are frequently complex structures. In some ways the results that have been derived from this approach are more in the spirit of Bales' conceptual formulations than were his empirical procedures. They are certainly more in line with the theoretical, negotiated order, view presented early in the thesis.

What follows is a brief survey of the kinds of structures which did emerge within the groups studied. It must be stressed that these structures were derived from single scales; they are not summaries of the overall structures of groups when all scales are taken into account. The latter will be discussed in the next section.

5.1. FOCUSSED STRUCTURE.

Figure 14.1. SOCIOGRAM OF A FOCUSSED STRUCTURE.



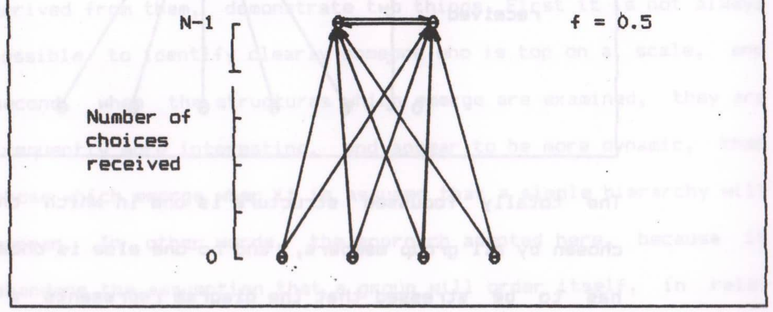
The totally focussed structure is one in which one person is chosen by all group members, and no-one else is chosen. Again it has to be stressed that the diagram represents a first-choice sociogram, which contains no information about the general level of choices within the group otherwise. For example, if the diagram above represented a Liking structure, it would not necessarily suggest that the group had low levels of Liking generally, simply that the person at the top of the diagram is the first choice for everyone within the group. The index of focusedness for a fully focussed structure is always 1, because of the way the index is calculated.

The summary measures which have been criticised several times throughout the thesis, are necessarily based on the assumption that a fully focussed structure, or something very similar, will emerge on all scales. The results described in the previous four chapters make it clear, however, that this is neither always, nor even most often the case. In point of fact, fully focussed, or almost fully focussed, structures emerged on only 7 occasions for Ideas (30%); 3 occasions for Guidance (13%); and 2 occasions for Liking (9%) - see table 14.1.

5.2. DOUBLE FOCUSSED STRUCTURE.

Figure 14.2. SOCIOGRAM OF A DOUBLE FOCUSSED STRUCTURE.

(For a group of N members)



The double focussed structure is one in which two people are both chosen by all other members, and no-one else is chosen. Structures of this sort did occur in the groups studied, although there were few examples, and in all cases the structure approximated the form given above, which can be considered the pure form, rather than reflected it exactly. In most cases, the structure which actually emerged contained other choices rather than those just for the two most chosen. The approximations to the double focussed structure,

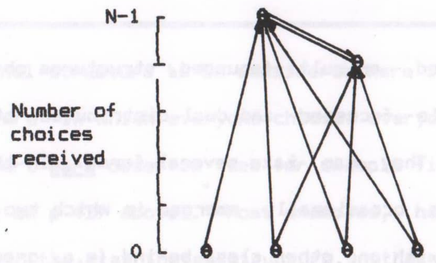
not taking into account whether the structure was a weak or a distributed one, occurred once on Ideas (4%); five times on Guidance (22%), and three times on Liking (13%) - see table 14.1.

The Index of Focusedness always returns a value of 0.5 for pure forms of the dual distributed structure.

5.3. DUAL DISTRIBUTED STRUCTURE.

Figure 14.3. SOCIOGRAM OF A DUAL DISTRIBUTED STRUCTURE.

(For a group of N members)

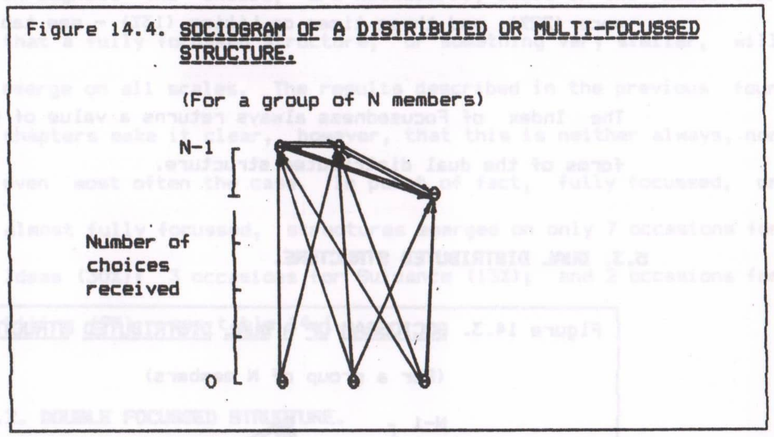


Similar to the double focussed structure, and not always easy to distinguish from it, is the dual distributed structure. This has one person most chosen in the group, in relation to a specific scale, and a second person also very closely chosen, but not quite as much. There are obviously many different ways in which such a structure could emerge, depending on the choice pattern within the group and the number of members, hence it is not possible to calculate a general value of f for this structure.

Structures of this kind were observed quite often in the groups studied above: 6 times on Ideas and the same for Guidance (26% in both cases), although none for Liking.

5.4. DISTRIBUTED OR MULTI FOCUSSED STRUCTURE.

Figure 14.4. SOCIOGRAM OF A DISTRIBUTED OR MULTI-FOCUSSED STRUCTURE.

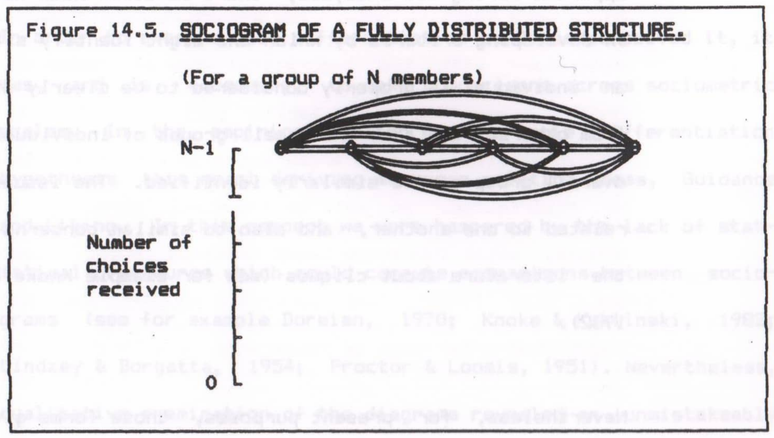


Distributed, or multi-focussed, structures obviously overlap with the double focussed and dual distributed structures described earlier. They can take several forms. In the groups studied, structures occasionally emerged in which two people were most chosen, with one other close behind (e.g. group 10, session 3, on Guidance). On other occasions one person would emerge as most chosen, with two or more other members close behind (e.g. group 1, Ideas). As presented here, these sorts of structures also overlap with more fully distributed structures in which a large proportion of the membership receives some choice; the more choices made in the group, and the more members who receive choices, the more distributed the structure.

Structures of this kind were fairly common: 5 times on Ideas (22%); 4 times on Guidance (17%); 7 times on Liking (30%).

5.5. FULLY DISTRIBUTED STRUCTURE.

Figure 14.5. SOCIOGRAM OF A FULLY DISTRIBUTED STRUCTURE.



The final structure to be considered here is the fully distributed structure in which everyone chooses everyone else. Structures of this sort were observed (see for example fig. 12.16., group 11, Liking on p 427 above). Most examples, however, were approximations to the distributed structure, rather than pure examples, and these have been included under the other headings above for the purposes of assessing frequencies. On only one occasion was there a fully distributed structure such as that illustrated in figure 14.5 which was group 11 on Liking for session 3 mentioned above.

6. GENERAL COMMENTS ABOUT THE STRUCTURAL FORMS.

Apart from the fully focussed and fully distributed structures illustrated above, it is obvious that there is a considerable overlap between the different structural forms described, and the division between them is to a very great extent arbitrary. There is, in this respect, a considerable amount of work which needs to be done, both empirical and conceptual, in order to develop a

clearer taxonomy of structural forms. Furthermore, as it became apparent during the analysis, there is still much work to be done in developing criteria by which one might identify situations when an individual is properly considered to be clearly differentiated from others, and also when small groups of individuals within the overall group may be similarly identified. The issues are clearly related to one another, and also to similar concerns expressed in the literature about cliques (see for example Knoke & Kuklinski, 1982).

Nevertheless, for present purposes, those forms given above are adequate to make the point that the emergent structures which were observed within the groups examined here, and in relation to particular scales, were seldom simple ones. The implications for research into role differentiation, and similar undertakings, are obvious; there are no short cuts to the study of emergent structures.

Overall, the results suggest that a somewhat more clinical approach to small groups is essential, as opposed to the blanket gathering and analysis of data aggregated across groups, group sessions, and so on. This thesis has illustrated the beginnings of an approach such as the former, and the advantages to be gained from it, as well as some of the severe shortcomings of the latter. Nevertheless, there is a price to pay. The approach adopted here, because it is more clinical in orientation than the approach typically adopted, is inevitably more time consuming.

7. COMPARING STRUCTURES ACROSS SCALES.

In order to examine role differentiation as Bales conceived it, it was, and is, necessary, to make comparisons across sociometric scales. In the empirical version of the role differentiation hypothesis this meant deriving measures relating Ideas, Guidance and Liking. In this respect we were hampered by the lack of statistical procedures which could compute comparisons between sociograms (see for example Doreian, 1970; Knoke & Kuklinski, 1982; Lindzey & Borgatta, 1954; Proctor & Loomis, 1951). Nevertheless, qualitative examination of the diagrams revealed an unmistakeably dynamic relationship between the different scales, and it seems that this approach is therefore a potentially very fruitful one for future research.

On the other hand, it doesn't seem to be adequate to rely solely on qualitative and intuitive approaches. Some work needs to be carried out on deriving appropriate measures, although in view of the considerable and well attested statistical problems which are encountered in this sort of research (see for example Bales, 1951; Bales & Slater, 1955), and which seem not to have been resolved to date, it is doubtful whether any progress will be easy. Nevertheless, there is a clear need for work of this sort to be conducted; it is essential, if progress is to be made in the study of small groups, that statistical procedures are developed specifically for group research. Clearly, the statistical procedures which are available "off-the-peg" are not adequate.

8. FUTURE RESEARCH.

On a more positive note, the structures which were observed are consistent with the theoretical view of leadership and small groups propounded in the earlier part of the thesis (chapters 3 & 4). In particular it is encouraging to note that there is evidence of distributed, as well as focussed, structural forms within groups, which therefore lends credence to the views of, for example, Gibb (1969), and certainly supports some aspects of the negotiated order view of leadership (e.g. Hosking, 1988).

This suggests several directions for future research. For example, there are obvious questions to ask in relation to the differences between groups which develop distributed rather than focussed structures. There are also obvious questions about the kinds of questions which generate distributed or focussed structures. It was observed earlier, for example, that questions which denote specific types of contributions such as Ideas, generate focussed structures, whereas those which are more abstract, such as Guidance, seem to generate a proponderance of distributed structures (although in this instance the effect was not significant).

Similarly, one could ask pertinent questions about the members of groups who emerge distinctly from the rest of the membership, and those who emerge marginally. These are, of course, questions which have already been examined (see for example, Bales & Slater, 1955; Borgatta et al., 1954; Smith, 1963, and so on). The difference here is that the analytical procedures adopted within this thesis allows much finer discriminations between different situations than the dominant approach typically adopted in the area.

9. OVERALL CONCLUSIONS.

Overall, the results of the research conducted as part of this thesis cast considerable doubt on the proposition that role differentiation, as it is typically portrayed in the literature, occurs with much regularity within small groups. Certainly, in the light of the kinds of structures which were observed to have emerged, the proposition that there occur identifiable task and social specialists, particularly when understood as identifiable individuals, seems to be a rather shaky one. Furthermore, conclusions which suggest that the person most active in the task area is "on average", or "in general", the second or third most popular group member (e.g. Bales, 1953 a, 1958) become comparatively meaningless.

The role differentiation hypothesis is not, however, refuted. On the contrary, the suggestion that dynamic relations between group members making different qualitative contributions to overall group dynamics is strengthened by the results. What needs to be revised is not the basic proposition itself, but the manner in which it is presented. In particular, it should be recast in terms of dynamic processes, and not in terms of individual specialists. This, it will be recalled, is broadly what was argued in relation to leadership early in the thesis, and this conclusion, therefore, brings the role differentiation hypothesis more clearly into correspondence with that view. In other words, the stage is set for a thorough examination of the role differentiation hypothesis. The research has only just begun.

The results suggest that the kinds of structures which typically emerge are comparatively complex ones, often approximating distributed structures (Gibb, 1969), although there were really too few groups examined to allow statistical estimates to be made. Nevertheless, in the light of these results, it makes little sense to examine groups as if all the structures which emerge are, even approximately, amenable to the sorts of analysis that rely on straightforward and unproblemmatic identification of person rated top on particular scales, as research in this area typically does.

The analytical approach advocated here is more clinical in orientation than that typically adopted, which makes it more time consuming, if nevertheless more fruitful. On the other hand, there are aspects of this approach which need some attention. In particular there is a need for clearer criteria for concluding that differentiation amongst members has occurred, and a better taxonomy of group structures needs to be formulated. There is also a considerable need for the development of statistical procedures specifically designed for small group work.

Despite these problems, however, the approach as adopted here has generated results which are broadly consistent with the theoretical stance adopted at the beginning of the thesis, and this is encouraging. Future research should therefore be aimed at identifying the circumstances in which distributed, as opposed to focussed, structures emerge, and there is every indication that this might be very fruitful. The role differentiation hypothesis, recast in terms of dynamic processes, should be an integral part of this future research.

Finally, since much of this thesis has been concerned with the work of Bales, and since much of it has been highly critical, it seems appropriate to let him have the last word:

> **"The fact that we ... have to learn more should not worry us. As our measuring instruments become outdated, we will know better how to reconstruct them. And as our generalisations and expectations require more and more qualification, I am confident that we will be able to construct and use more complex models. ...**
>
> **If we wish to build an integrated and fully competent social psychology we must do more of our work in complex real-life situations, where we ourselves must show competence in order to survive. We must render services that make the people we work with glad to have us around. We must be able to deal with complexity. ... To be realistic and competent we will have to develop our knowledge in the institutional and organisational settings where we expect them to be useful. ... This will tend to divide the practioners of the discipline, but it is also the way to development. The differentiated findings and theory so produced will have to be reintegrated by the academic social psychologist, who will have his [or her] hands full if he [or she] does his [or her] job right. We are all in for a hard job if we are to make our discipline what it should be. But I am confident that we can and will do it." (Bales, 1983: 11 - 12).**

APPENDICES.

APPENDIX A: THE EMPIRICAL BACKGROUND TO THE ROLE DIFFERENTIATION HYPOTHESIS: Extended data set related to the discussions in Chapters 5, 6, & 7 above).

TABLE A.1. Intercorrelations between Talking, Receiving, and ratings on Ideas, Guidance and Liking. 494

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Table A.1. Intercorrelations between Talking, Receiving, Ideas, Guidance and Liking.

(Mean rank order correlations of 64 sessions. Size 3 excluded)

High Status Consensus Groups.

		T	R	I	G	L
Talking	T		.88	.80	.75	.38
Receiving	R			.74	.74	.46
Ideas	I				.83	.41
Guidance	G					.49
Liking	L					

Low Status Consensus Groups.

		T	R	I	G	L
Talking	T		.69	.48	.51	.10
Receiving	R			.44	.52	.16
Ideas	I				.71	.14
Guidance	G					.27
Liking	L					

No significance levels cited.

Adapted from Slater (1955: 615).
See also p 189 above.

These figures are those given by Slater (1955), and partly discussed in chapter 5 above. No significance levels are given, but since the magnitude of the coefficients is comparable with those given by Bales and Slater (1955: 286), and the sample size is larger, it is reasonable to assume that all of the coefficients are significant at $p \leq 0.01$, with the possible exception of the right hand column of the low SC groups.

It is interesting to note that, of the ten coefficients presented above for high SC groups, seven of them are lower, and three higher, than those quoted by Bales and Slater, whereas for the low SC groups six are higher, two the same, and two lower.

Table A.2. Levels of significance of differences between correlation coefficients involving Liking.

(Values of rho given in parentheses)

High Status Consensus Groups.

	T-R (.90)	T-I (.83)	T-G (.73)	R-I (.76)	R-G (.73)	I-G (.82)
L-T (.46)	.01	.01	.05	.05	.05	.05
L-R (.55)	.05					
L-I (.46)	.01	.01	.05	.01	.05	.01
L-G (.53)	.01	.05				

Low Status Consensus Groups.

	T-R (.69)	T-I (.36)	T-G (.46)	R-I (.41)	R-G (.49)	I-G (.77)
L-T (.10)	.01				.05	.01
L-R (.10)	.01				.05	.01
L-I (.16)	.01				.05	.01
L-G (.18)	.01					.01

T = Talking; R = Receiving; I = Ideas; G = Guidance; L = Liking.

Adapted from Bales & Slater (1955: 287)

These figures were quoted by Bales and Slater (1955: 287), as part of the demonstration that Liking seems to separate out as an independent factor particularly in low SC groups (see pp 192 - 193 above). They don't seem to have taken these results particularly seriously, however, first because they were tucked away in a footnote, and second because they contain three errors.

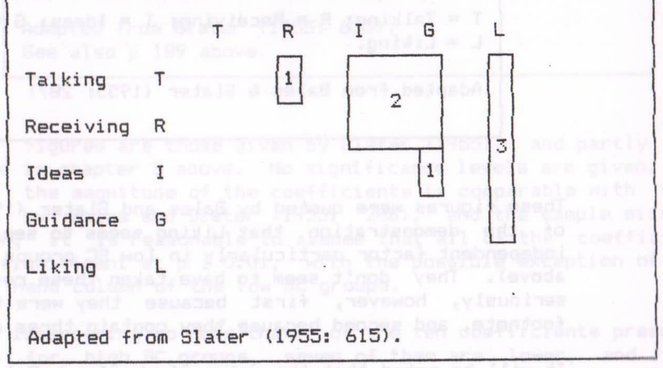
It will be noted that the value of rho for L-T is the same as that for L-I (r_s = .46). On this basis the rows of values for these two ought to be identical. A comparison of the values under the columns R-I and I-G, however, reveals discrepancies. Furthermore, the value for L-T under column T-G was missed out altogether. It has been supplied in the table above. Thus, rather than 14 out of the 24 comparisons for high SC groups being significant, there are, in point of fact 15.

It might be remarked that of the 24 comparisons for the low SC groups, only 11 are significant. This is obviously a consequence

of generally lower coefficients for these groups, as compared with the high SC groups. But, using the logic of Bales and Slater's own arguments, this fact could be interpreted as indicating that the tendency for Liking to separate as an independent factor is less pronounced in low SC groups than in high SC groups. This is exactly the opposite effect to that which they claim to have found in their results.

The logic behind making just the 24 comparisons listed above, was to test the proposition that correlations involving Liking were lower than those involving all other scales. It might be noted as a point of information, however, that with 5 scales grouped into 10 unique transitive pairs (for example where T-R ≡ R-T) there is a total of 45 potential comparisons, and for comparisons of coefficients involving a specified scale (e.g. Liking) there is a total of 30 in each case. Bales and Slater, in their comparisons, simply ignored the six that involved comparisons of two coefficients relating to Liking (i.e. L-T with L-R, L-I, & L-G; L-R with L-I, & L-G; and L-I with L-G).

Table A.3. Slater's grouping of the intercorrelation matrix.



Adapted from Slater (1955: 615).

For discussions related to this diagram see pp 193 and 259 above.

Table A.4. Percentage of total number of sessions (80) in which the same person holds top position in two rank orders at the same time.

(Size 3 included)

High Status Consensus Groups.

		T	R	I	G	L
Talking	T		51.3	63.3	36.5	20.5
Receiving	R			53.3	39.0	34.3
Ideas	I				56.3	32.0
Guidance	G					45.5
Liking	L					

Low Status Consensus Groups.

		T	R	I	G	L
Talking	T		52.5	43.7	40.0	32.0
Receiving	R			28.7	42.5	37.0
Ideas	I				50.0	16.5
Guidance	G					20.0
Liking	L					

No significance levels given.

Adapted from Slater (1955: 614).

Table A.5. Direction of differences of association on sociometric dimensions between High SC groups and Low SC groups

		T	R	I	G	L
Talking	T		+	−	+	+
Receiving	R			−	+	+
Ideas	I				−	−
Guidance	G					−
Liking	L					

Based on the figures given in table A.4 above.

These figures relate to the discussions given on p 197 -198 and 267 - 271 above. They are intended for comparison with table 5.5, on p 197.

Table A.6. Number of sessions* out of a possible 56 in which a given person holds top position in one and only one rank order out of five possible rank orders.

	High SC Groups (28 Sessions)	Low SC Groups (28 Sessions)	All Groups (56 Sessions)
Talking	3.0	3.0	6.0
Receiving	2.5	4.0	6.5
Ideas	1.0	6.0	7.0
Guidance	2.6	5.5	8.1
Liking	9.0	13.8	22.8
TOTAL	18.1	32.3	50.4

* Decimals arise from ties in rankings.

Source: Bales & Slater (1955: 278)

This table is intended for comparison with table 5.4 on page 196 above. According to Bales and Slater, the figures for Liking overall are significantly higher than all other characteristics at the 0.001 level (Chi Square). For the high SC groups alone the difference is significant at the 0.01 level, and for the low SC groups it is significant at the 0.001 level. It is perhaps worth pointing out, however, that the incidence of isolated prominence, which this table purports to show, with the sole exception of Liking in the low SC groups, nowhere reaches a level of even 50%. This means, if isolated prominence can be taken as a measure of differentiation of roles, that there is an incidence of role integration greater than 50% in all cases. That is to say, in more than half the cases all characteristics, including Liking, are associated with at least one other characteristic, although because no details are given it is not possible to say with which. This, of course, tends to undermine the empirical support for the role differentiation hypothesis.

It is not clear what purpose the inclusion of the column totals serves.

Table A.7. Composite profiles in percentages of 23 persons ranked top on Ideas and 23 persons rated best-Liked for the same Sessions.

(IPA categories)

	Interaction Category	Initiated		Received	
		I	L	I	L
Area A: Positive Social+	1. Solidarity	4.19	4.79	2.90	3.68
	2. Tension rel*	5.97	7.71	8.40	10.38
	3. Agreement	14.60	14.97	22.92	17.88
Area B: Task Attempts	4. Suggestion	8.66	5.68	6.14	6.36
	5. Opinion	31.30	27.20	26.28	28.86
	6. Orientation	17.90	17.91	15.24	13.73
Area C: Questions	7. Orientation	3.66	3.43	2.78	3.01
	8. Opinion	2.39	2.73	2.00	1.98
	9. Suggestion	.98	1.58	.72	.33
Area D: Negative Social	10. Disagreement	7.31	8.43	9.50	10.21
	11. Tension inc*	1.97	3.67	1.30	1.37
	12. Antagonism	1.07	1.90	1.74	2.21

+ The interaction category labels have been shortened because of lack of space. The complete labels should include the following verbs: A - "Shows" (e.g. Shows solidarity); B - "Gives" (e.g. Gives orientation); C - "Asks" (e.g. Asks Opinion); C - "Shows" (e.g. Shows antagonism).

* Category 2: Tension Release;
Category 11: Tension Increase.

Adapted from Bales & Slater (1955: 279).

Differences between the two persons were tested on the following sets of categories by means of a correlated t-test. The significance levels are shown in parentheses.

Initiated: 1+2 (0.05 level)
4+5 (0.01 level)
10+11+12 (0.05 level)

Received: 1+2 (0.05 level)
4+5 (not significant)
10+11+12 (not significant)

No rationale is offered for the analysis of only these groups of characteristics, although Bales and Slater do draw attention to the difficulty of analysing the results at all, principally on the

grounds of interdependence of categories (p 280). They also make the following comment:

> "Although these tests do not directly test the differences in [table A.7] which are based on the composite profiles of raw scores rather than means of individual percentage profiles, we assume that the differences are of the same order and the tests therefore relevant." (Bales & Slater, 1955: 280).

In the light of this comment, it is actually very difficult to work out precisely what the analyses are meant to show, or indeed what they do show. Unfortunately this sort of obscure data transformation tends to be a feature of Bales' writing and analyses.

APPENDIX B: SUMMARY OF THE GROUPS STUDIED.

	GROUP	TYPE	N	M/F	SESSIONS	QUESTIONNAIRE
Study 1:	1	Laboratory	6	?	1	WarwQ
Ch.10; p 361	2	"	6	"	1	"
	3	"	6	"	1	"
	4	"	6	"	1	"
	5	"	8	"	1	"
	6	"	6	"	1	"
Study 2:	7	Tutorial	4	2F;2M	1	"
Ch.11; p 390	8	"	4	2F;2M	1	"
Study 3:	9	"	5*	5M	3	"
Ch.12; p 400	10	"	4*	4F	3	"
	11	"	5*	1F;4M	3	"
Study 4:	12	Laboratory	4	3F;1M	1	SGQ
Ch.13; p 431	13	"	6	3F;3M	1	"
	14	"	4	4F	1	"
	15	"	5	5F	1	"
	16	"	7	6F;1M	1	"
	17	"	7	6F;1M	1	"
	18	"	7	5F;2M	1	"

* Size and composition for these groups is given for the first session; each group had one member absent for at least one session, and group 9 had a sustitution - see chapter 12 above.

APPENDIX C: CALL FOR VOLUNTEERS.

THE UNIVERSITY
OF ASTON
IN BIRMINGHAM

MEMORANDUM

Ref LP/lp

To All students in tutorial groups E & F, MAS(1).

From Les Prince.

CALL FOR VOLUNTEERS.

This is your chance to help push back the frontiers of ignorance. Volunteers are needed to assist in research on small groups.

The procedure involves taking part in a series of discussions, and the completion of two questionnaires, one of which is completed only once, and the other after each session. The questionnaires take between 15 minutes and half an hour to complete. The procedure is explained in more detail on the enclosed consent form.

Members of my tutorial groups who agree to take part will be asked only to undertake their usual tutorial activities, and then to complete the questionnaires immediately after each session, thus requiring only about a quarter of an hour of their time each fortnight.

It must be stressed that participation in this research is on a voluntary basis only. IT IS NOT A COURSE REQUIREMENT, and course results will not be affected either by participation or non-participation. Furthermore, participants are free to terminate their involvement at any time, with no prejudice to themselves.

If you are interested in taking part, please complete the consent form which accompanies this letter, and return it to me either in room S909, or at the next tutorial session.

Pip pip,

L C Prince

Les Prince.

APPENDIX D: EXPLANATION AND CONSENT FORM FOR VOLUNTEER SUBJECTS.

EXPLANATION AND CONSENT FORM FOR VOLUNTEER SUBJECTS.

PROJECT TITLE: THE NEGOTIATION OF ORDER IN SMALL GROUPS.

RESEARCH WORKER: Les Prince,
OPE Group, Management Centre, University of Aston.

EXPLANATION OF PROCEDURE AND HAZARDS.

1) Pre-session questionnaire: Subjects are asked to complete a pre-session questionnaire, consisting of 7 sub-questionnaires, each of which is concerned with a different aspect of the subject's view of team-working. This questionnaire is completed only once, regardless of the number of sessions that the subject takes part in, and takes approximately 15 to 30 minutes to complete.

2) Groups: Subjects are assembled into groups of 4 to 5 members. It is usual for subjects to choose their own groups, rather than being assigned by the researcher.

3) Group discussion: Each group is asked to discuss a topic, usually supplied, for 30 to 45 minutes. There is one topic per session, and groups may meet for one or more sessions, usually spaced by about a fortnight.

4) Post-session questionnaire: After each session, group members are asked to complete a post-session questionnaire consisting of:

a) 20 sociometric questions in which each group member gives a rating for each other group member on a supplied scale,

b) 10 attitude scales concerning the group and the session,

c) a further set of rating scales (SYMLOG), the number of which varies with the number of members in the group.

5) Hazards to subjects: The hazards to individuals are minimal. However, it is recognised that should some of the information gathered, being in the nature of personal assessments of other people, be made available in such a way that specific persons could be identified, then there is a danger that a loss of self-esteem or friendship ties might occur. The procedure has been specifically designed to avoid this possibility, and to maintain the strictest confidence.

6) Confidentiality: ALL information received from the questionnaires is treated with the strictest confidence. Moreover, personal detail which might help in the identification of individuals is specifically excluded. Questionnaires are filed by group alone, and not by the subject's name.

Nevertheless, the nature of the research is such that data from different sessions need to be collated with one another, and in order to accomplish this subjects are requested to key their questionnaires with a symbol or personal mark which they must remember. Again, these

symbols are filed by group, and in such a way that only the person whose symbol it is can recognise it.

The procedure is such that the researcher depends upon the subjects to remember both the group to which they belong and their own symbols, because there is no independent record of this information. That is to say, the procedure is such that even the researcher is unable to identify specific individuals.

STATEMENT OF VOLUNTEER.

I have read and understand the explanation given above. I have had the opportunity to discuss it with the investigator, and to ask any questions I had. I agree to take part in the project described above, and I understand that I am free to withdraw at any time.

Signed: _____

Tutor Group: _____

Date: _____/_____/_____

APPENDIX E: THE WARWICK QUESTIONNAIRE (WarwQ).

DESCRIPTION OF PROCEDURE. 508

SOCIOMETRIC SCALES. 509

ATTITUDE SCALES. 512

LEAST PREFERRED CO-WORKER SCALE. 514

MOST PREFERRED CO-WORKER SCALE. 515

SYMLOG INTERPERSONAL RATING FORM (Behaviour). 516

SYMLOG INTERPERSONAL RATING FORM (Values). 517

Gn___; N___; S___

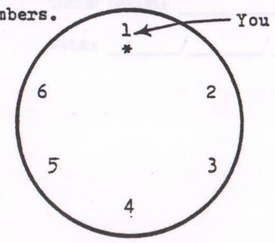
This questionnaire is the final part of the study. It is not a test; there are no right or wrong answers, and you will not be scored on your performance. We would like you simply to record your impressions of the members of your group as they behaved in the discussion in which you have just taken part.

PLEASE DO NOT PUT YOUR NAME OR ANY OTHER DISTINGUISHING MARK ON THIS PAPER, since you will not be identified. Your answers are confidential and the procedure has been designed to preserve your anonymity.

PLEASE DO NOT CONFER WITH OTHER GROUP MEMBERS AS YOU COMPLETE THIS QUESTIONNAIRE.

In order to proceed could you please adopt the following procedure:

i) Consider yourself as group member no. 1, the remaining members of your group should be numbered successively in a clockwise direction (see diagram). If your group consists of less than or more than 6 members, number consecutively from 1 up to and including the total number of group members.

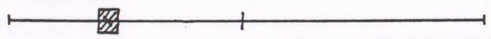


ii) Read the first question carefully.

iii) When you are sure that you have understood the question, indicate your answer on the accompanying scale with a cross, as follows:

Please be sure that your answer cuts the scale clearly at a definite point.

If you wish to alter your answer, erase the incorrect mark with a box and record your new answer as above. However please try to avoid altering your answers.



iv) Please answer each question as quickly and carefully as you can. However this is not a time trial, and you will not be scored on your performance.

Please turn to the next page.

v) Repeat the procedure until you have completed each section of each question, at no point referring back to your earlier answers. IT IS VERY IMPORTANT THAT YOU ANSWER EACH QUESTION FULLY AND WITHOUT REFERENCE TO EARLIER ANSWERS. This is because we are looking for your spontaneous impressions and memories.

DO NOT START UNTIL YOU ARE CERTAIN WHAT WE WOULD LIKE YOU TO DO. PLEASE ASK IF YOU HAVE ANY QUERIES, WE WILL BE PLEASED TO HELP.

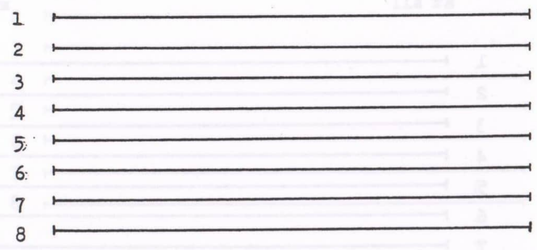
Finally, if you have any comments which you think may be relevant or interesting, please write them on the back of the last sheet.

THANKYOU VERY MUCH FOR YOUR CO-OPERATION.

If you are clear what we would like you to do, pleasebegin with this first scale:

Qu.1. For each member of the group, could you give an estimate of the number of good ideas contributed that were useful for solving problems? A cross at the left of the scale would indicate that that person contributed few, or even no ideas; a cross at the right of the scale indicates that that person contributed many.

None at all — Many



Who contributed the best ideas? Please indicate by putting a circle around that person's number.

Now, if you are quite clear about what we would like you to do, please turn to the next page.

Qu.2. For each member of the group, could you give an estimate of the contribution made towards guiding the discussion and keeping it moving effectively?

	None at all	Much
1		
2		
3		
4		
5		
6		
7		
8		

Qu.3. For each member of the group, could you please indicate how much you personally liked them? (If possible please try to make your assessment on the basis of that person's behavour in the group discussion)

	Not at all	Very much
1		
2		
3		
4		
5		
6		
7		
8		

Qu.4. For each member of the group, could you indicate how much you think they functioned as a leader in the discussion?

	Not at all	Very much
1		
2		
3		
4		
5		
6		
7		
8		

Qu.5. If you were asked to take part in a similar group session, which members of this group would you welcome as collegues?

	Not at all	Very much
1		
2		
3		
4		
5		
6		
7		
8		

Qu.6. In your opinion would you say that one particular individual stood out most definitely as a leader in the discussion? If so please indicate who it was by putting a circle around his or her number below.
For the remaining group members please indicate how much you consider their behaviour to have been leaderlike.

Not at all — Very much

1 ——
2 ——
3 ——
4 ——
5 ——
6 ——
7 ——
8 ——

Qu.7. Did you find the discussion enjoyable?

Not at all — Very much

Qu.8. If asked to take part in a similar session, would you accept the request?

Not at all — Willingly

Qu.9. Do you think that a discussion group, such as the one that you have just taken part in, needs a leader?

Not at all — Very much

Qu.10. If asked to take part in a similar session, would you like to continue with the present group?

Not at all — Very much

Qu.11. If you were asked to take part in a similar session, would you prefer a different group?

Not at all — Very much

Qu.12. Did you find the discussion personally satisfying?

Not at all — Very much

Qu.13. If you were asked to take part in a similar session, with the same group, and you were asked to select a group leader, who would you select? Please indicate by putting a circle around that person's number.

1 2 3 4 5 6 7 8

Qu.14. If given a free choice in the matter, would you prefer to take part in a group with or without a leader?

Without a leader — With a leader

People differ in the ways they think about those with whom they work. This may be important in working with others. Think of the person with whom you can work least well. This may be someone you work with now, or someone you knew in the past. It is not neccessarily someone in the group you are with at the moment.
This person does not have to be the person you like least well, but should be the person with whom you had the most difficulty in getting a job done. Describe this person as he or she appears to you. Please give your immediate first reaction.

EFFICIENT	INEFFICIENT
UNPLEASANT	PLEASANT
HELPFUL	FRUSTRATING
PRODUCTIVE	UNPRODUCTIVE
UNFRIENDLY	FRIENDLY
CONSIDERATE	INCONSIDERATE
ADVENTUROUS	UNADVENTUROUS
COLD	WARM
RELIABLE	UNRELIABLE
AMBITIOUS	UNAMBITIOUS
GLOOMY	CHEERFUL
CLOSE	DISTANT
ENTERPRISING	UNENTERPRISING
CARELESS	CAREFUL
OPEN	GUARDED
INTERESTING	BORING

Now think of the person with whom you can work best. Again, it may be someone you work with now or someone you knew in the past. It is not neccessarily someone in the group you are with at the moment.
This person does not have to be the person you like best, but should be the person with whom you have been able to work best. Describe this person as he or she appears to you. Please give your immediate first reaction.

EFFICIENT	INEFFICIENT
UNPLEASANT	PLEASANT
HELPFUL	FRUSTRATING
PRODUCTIVE	UNPRODUCTIVE
UNFRIENDLY	FRIENDLY
CONSIDERATE	INCONSIDERATE
ADVENTUROUS	UNADVENTUROUS
COLD	WARM
RELIABLE	UNRELIABLE
AMBITIOUS	UNAMBITIOUS
GLOOMY	CHEERFUL
CLOSE	DISTANT
ENTERPRISING	UNENTERPRISING
CARELESS	CAREFUL
OPEN	GUARDED
INTERESTING	BORING

In this section we would like you to describe how the members of your group (including yourself) behaved during the discussion, using the descriptions below. Please use a seperate sheet for each person described. To complete your description simply circle the choice which best fits the person you are describing for each item. There are 26 items altogether, please complete them all. When you have finished you should have a seperate description for each member of your group.

Please indicate which person you are describing by writing their number in this space_____

U	active, dominant, talks a lot	rarely	sometimes	often
UP	extroverted, outgoing, positive	rarely	sometimes	often
UPF	a purposeful democratic task leader	rarely	sometimes	often
UF	an assertive business-like manager	rarely	sometimes	often
UNF	authoritarian, controlling, disapproving	rarely	sometimes	often
UN	domineering, tough-minded, powerful	rarely	sometimes	often
UNB	provocative, egocentric, shows off	rarely	sometimes	often
UB	jokes around, expressive, dramatic	rarely	sometimes	often
UPB	entertaining, sociable, smiling, warm	rarely	sometimes	often
P	friendly, equalitarian	rarely	sometimes	often
PF	works cooperatively with others	rarely	sometimes	often
F	analytical, task-oriented, problem-solving	rarely	sometimes	often
NF	legalistic, has to be right	rarely	sometimes	often
N	unfriendly, negativistic	rarely	sometimes	often
NB	irritable, cynical, won't cooperate	rarely	sometimes	often
B	shows feelings and emotions	rarely	sometimes	often
PB	affectionate, likeable, fun to be with	rarely	sometimes	often
DF	looks up to others, appreciative, trustful	rarely	sometimes	often
DPF	gentle, willing to accept responsibility	rarely	sometimes	often
DF	obedient, works submissively	rarely	sometimes	often
DNF	self punishing, works too hard	rarely	sometimes	often
DN	depressed, sad, resentful, rejecting	rarely	sometimes	often
DNB	alienated, quits, withdraws	rarely	sometimes	often
DB	afraid to try, doubts own ability	rarely	sometimes	often
DPB	quietly happy just to be with others	rarely	sometimes	often
D	passive, introverted, says little	rarely	sometimes	often

Here we would like you to describe the kinds of values that the members of your group (including yourself) seemed to favour during the discussion, using the descriptions below. Please use a seperate sheet for each person described. To complete your description simply circle the choice which best fits the person you are describing, for each item. There are 26 items altogether, please complete them all. When you have finished you should have a seperate description for each member of your group.

Please indicate which person you are describing by writing their number in this space_____

U	material success and power	rarely	sometimes	often
UP	popularity and social success	rarely	sometimes	often
UPF	social solidarity and progress	rarely	sometimes	often
UF	efficiency, strong effective management	rarely	sometimes	often
UNF	a powerful authority, law and order	rarely	sometimes	often
UN	tough-minded assertiveness	rarely	sometimes	often
UNB	rugged individualism, self gratification	rarely	sometimes	often
UB	having a good time, self expression	rarely	sometimes	often
UPB	making others feel happy	rarely	sometimes	often
P	equalitarianism, democratic participation	rarely	sometimes	often
PF	altruism, idealism, cooperation	rarely	sometimes	often
F	established social beliefs and values	rarely	sometimes	often
NF	value-determined restraint of desires	rarely	sometimes	often
N	individual dissent, self-sufficiency	rarely	sometimes	often
NB	social noncomformity	rarely	sometimes	often
B	unconvential beliefs and values	rarely	sometimes	often
PB	friendship, liberalism, sharing	rarely	sometimes	often
DP	trust in the goodness of others	rarely	sometimes	often
DPF	love, faithfulness, loyalty	rarely	sometimes	often
DF	hard work, self-knowledge, subjectivity	rarely	sometimes	often
DNF	suffering	rarely	sometimes	often
DN	rejection of popularity	rarely	sometimes	often
DNB	admission of failure, withdrawal	rarely	sometimes	often
DB	noncooperation with authority	rarely	sometimes	often
DPB	quiet contentment, taking it easy	rarely	sometimes	often
D	giving up all selfish desires	rarely	sometimes	often

APPENDIX F: THE SMALL GROUPS QUESTIONNAIRE (SGQ).
PART ONE: The Presession Questions.

DESCRIPTION OF PROCEDURE. 519

BELBIN'S SELF PERCEPTION INVENTORY. 521

SYMLOG RATING FORM - SELF. 525

SYMLOG RATING FORM - WISH. 526

LEAST PREFERRED CO-WORKER SCALE. 527

SYMLOG RATING FORM - LEAST PREFERRED CO-WORKER. 528

MOST PREFERRED CO-WORKER SCALE. 529

SYMLOG RATING FORM - MOST PREFERRED CO-WORKER. 530

The University of Aston
Management Centre.

For office use only.

Date:____/____/____

Series:_____

SMALL GROUPS QUESTIONNAIRE
(Part One: Presession).

Gn:_____ S:_____

A: Please put your symbol here.

CONFIDENTIAL

This booklet contains several questionnaires. It is not a test; there are no right or wrong answers, and you will not be scored on your performance. We would like you simply to describe the way you see yourself, and two other people who are described below.

1) YOUR ANSWERS ARE CONFIDENTIAL, and the procedure has been designed to preserve your anonymity.

2) Please devise a symbol to place in the box marked "A" at the top of the page. This symbol can take any form you wish; a word, a phrase, an abstract symbol, or even, if you wish, your initials. This will become your personal identification mark for all other sessions, and you will need to remember it.

These symbols will be placed in a directory under your group, not under your name, and will help us to arrange the information so that we can put together the results we get from this session with descriptions from past or future sessions.

3) Instructions for completing the questionnaires are given in the appropriate places below.

4) This booklet contains seven separate questionnaires, PLEASE BE SURE TO COMPLETE THEM ALL.

AS YOU COMPLETE THE QUESTIONNAIRES:

1) Please answer each question as quickly and as carefully as you can. However, this is not a time trial so please take as much time as you need.

2) PLEASE DO NOT REFER TO YOUR EARLIER ANSWERS, we are interested in your immediate first impressions.

3) PLEASE DO NOT CONFER WITH OTHER GROUP MEMBERS AS YOU COMPLETE THE QUESTIONNAIRES. It is your impressions which are important.

4) Please do not start until you are sure what to do. If you are uncertain, at any point, please ask.

BEFORE STARTING THE QUESTIONNAIRES OVERLEAF, could you please give us the following information. As stated earlier, all details will be treated in the strictest confidence, and you will not be identified personally in any report that may follow.

(a) How old are you (to the nearest year)?:_____

(b) What is your Sex (M/F)?:_____

THANKYOU VERY MUCH FOR YOUR CO-OPERATION.

If you are clear about what we would like you to do, please turn over and begin the first questionnaire.

BELBIN'S SELF PERCEPTION INVENTORY

DIRECTIONS FOR COMPLETING THE INVENTORY.

For each section distribute a total of ten points among the sentences which you think best describe your behaviour. These might be spread among all the sentences, or ten points may be given to a single sentence. Enter the points in the column next to the sentences.

There are seven sections in this questionnaire, please complete them all.

If you are clear about what to do, please begin with the first section below.

1) What I believe I can contribute to a team:

(a)	I think I can quickly see and take advantage of new opportunities.	
(b)	I can work well with a very wide range of people.	
(c)	Producing ideas is one of my natural assets.	
(d)	My ability rests in being able to draw people out whenever I detect they have something of value to contribute to group objectives.	
(e)	My capacity to follow through has much to do with my personal effectiveness.	
(f)	I am ready to face temporary unpopularity if it leads to worthwhile results in the end.	
(g)	I am quick to sense what is likely to work in a situation with which I am familiar.	
(h)	I can offer a reasoned case for alternative courses of action without introducing bias or prejudice.	
	TOTAL:	1Ø

If you are sure what to do, please turn over.

2) If I have a possible shortcoming in teamwork, it could be that:

(a) I am not at ease unless meetings are well structured and controlled and generally well conducted.

(b) I am inclined to be too generous towards others who have a valid viewpoint that has not been given a proper airing.

(c) I have a tendency to talk a lot once the group gets on to new ideas.

(d) My objective outlook makes it difficult for me to join in readily and enthusiastically with colleagues.

(e) I am sometimes seen as forceful and authoritarian if there is a need to get something done.

(f) I find it difficult to lead from the front, perhaps because I am over responsive to group atmosphere.

(g) I am apt to get too caught up in ideas that occur to me and so lose track of what is happening.

(h) My colleagues tend to see me as worrying unnecessarily over detail and the possibility that things may go wrong.

---

3) When involved in a project with other people:

(a) I have an aptitude for influencing people without pressurising them.

(b) My general vigilance prevents careless mistakes and omissions being made.

(c) I am ready to press for action to make sure that the meeting does not waste time or lose sight of the main objective.

(d) I can be counted on to contribute something original.

(e) I am always ready to back a good suggestion in the common interest

(f) I am keen to look for the latest in new ideas and developments.

(g) I believe my capacity for cool judgement is appreciated by others.

(h) I can be relied upon to see that all essential work is organised.

4) My characteristic approach to group work is that:

(a) I have a quiet interest in getting to know colleagues better.

(b) I am not reluctant to challenge the views of others or to hold a minority view myself.

(c) I can usually find a line of argument to refute unsound propositions.

(d) I think I have a talent for making things work once a plan has to be put into operation.

(e) I have a tendency to avoid the obvious and to come out with the unexpected.

(f) I can bring a touch of perfectionism to any team job I undertake.

(g) I am ready to make use of contacts outside the group itself.

(h) While I am interested in all views I have no hesitation in making up my mind once a decision has to be made.

---

5) I gain satisfaction in a job because:

(a) I enjoy analysing situations and weighing up all the possible choices.

(b) I am interested in finding practical solutions to problems.

(c) I like to feel I am fostering good working relationships.

(d) I can have a strong influence on decisions.

(e) I can meet people who may have something new to offer.

(f) I can get people to agree on a necessary course of action.

(g) I feel in my element where I can give a task my full attention.

(h) I like to find a field that stretches my imagination.

6) If I am suddenly given a difficult task with limited time and unfamiliar people:

(a) I would feel like retiring to a corner to devise a way out of the impasse before developing a line. ____

(b) I would be ready to work with the person who showed the most positive approach, however difficult he or she might be. ____

(c) I would find some way of reducing the size of the task by establishing what different individuals might best contribute. ____

(d) My natural sense of urgency would help to ensure that we did not fall behind schedule. ____

(e) I believe I would keep cool and maintain my capacity to think straight. ____

(f) I would retain a steadiness of purpose in spite of the pressures. ____

(g) I would be prepared to take a positive lead if I felt the group was making no progress. ____

(h) I would open up discussions with a view to stimulating new thoughts and getting something moving. ____

7) With reference to the problems to which I am subject in working in groups:

(a) I am apt to show my impatience with those who are obstructing progress. ____

(b) Others may criticise me for being too analytical and insufficiently intuitive. ____

(c) My desire to ensure that work is properly done can hold up proceedings. ____

(d) I tend to get bored rathrer easily and rely on one or two stimulating members to spark me off. ____

(e) I find it difficult to get started unless the goals are clear. ____

(f) I am sometimes poor at explaining and clarifying complex points that occur to me. ____

(g) I am conscious of demanding from others the things that I cannot do myself. ____

(h) I hesitate to get my points across when I run up against real opposition. ____

In this section we would like you to describe how you behave during group activities, using the descriptions below.

To complete your description simply circle or highlight the choice which best fits your behaviour, on each item. There are 26 descriptions altogether, please complete them all. When you have finished you should have a complete description consisting of ratings on all 26 items.

U	active, dominant, talks a lot.	rarely	sometimes	often
UP	extroverted, outgoing, positive.	rarely	sometimes	often
UPF	a purposeful democratic leader.	rarely	sometimes	often
UF	an assertive business-like manager.	rarely	sometimes	often
UNF	authoritarian, controlling, disapproving.	rarely	sometimes	often
UN	domineering, tough-minded, powerful.	rarely	sometimes	often
UNB	provocative, egocentric, shows off.	rarely	sometimes	often
UB	jokes around, expressive, dramatic.	rarely	sometimes	often
UPB	entertaining, sociable, smiling, warm.	rarely	sometimes	often
P	friendly, equalitarian.	rarely	sometimes	often
PF	works co-operatively with others.	rarely	sometimes	often
F	analytical, task-oriented, problem-solving.	rarely	sometimes	often
NF	legalistic, has to be right.	rarely	sometimes	often
N	unfriendly, negativistic.	rarely	sometimes	often
NB	irritable, cynical, won't co-operate.	rarely	sometimes	often
B	shows feelings and emotions.	rarely	sometimes	often
PB	affectionate, likeable, fun to be with.	rarely	sometimes	often
DP	looks up to others, appreciative, trustful.	rarely	sometimes	often
DPF	gentle, willing to accept responsibility.	rarely	sometimes	often
DF	obedient, works submissively.	rarely	sometimes	often
DNF	self punishing, works too hard.	rarely	sometimes	often
DN	depressed, sad, resentful, rejecting.	rarely	sometimes	often
DNB	alienated, quits, withdraws.	rarely	sometimes	often
DB	afraid to try, doubts own ability.	rarely	sometimes	often
DPB	quietly happy just to be with others.	rarely	sometimes	often
D	passive, introverted, says little.	rarely	sometimes	often

Now, using the same descriptions, please describe how you would <u>like</u> to behave, in group discussions.

Remember, please complete all 26 descriptions.

U	active, dominant, talks a lot.	rarely	sometimes	often
UP	extroverted, outgoing, positive.	rarely	sometimes	often
UPF	a purposeful democratic leader.	rarely	sometimes	often
UF	an assertive business-like manager.	rarely	sometimes	often
UNF	authoritarian, controlling, disapproving.	rarely	sometimes	often
UN	domineering, tough-minded, powerful.	rarely	sometimes	often
UNB	provocative, egocentric, shows off.	rarely	sometimes	often
UB	jokes around, expressive, dramatic.	rarely	sometimes	often
UPB	entertaining, sociable, smiling, warm.	rarely	sometimes	often
P	friendly, equalitarian.	rarely	sometimes	often
PF	works co-operatively with others.	rarely	sometimes	often
F	analytical, task-oriented, problem-solving.	rarely	sometimes	often
NF	legalistic, has to be right.	rarely	sometimes	often
N	unfriendly, negativistic.	rarely	sometimes	often
NB	irritable, cynical, won't co-operate.	rarely	sometimes	often
B	shows feelings and emotions.	rarely	sometimes	often
PB	affectionate, likeable, fun to be with.	rarely	sometimes	often
DP	looks up to others, appreciative, trustful.	rarely	sometimes	often
DPF	gentle, willing to accept responsibility.	rarely	sometimes	often
DF	obedient, works submissively.	rarely	sometimes	often
DNF	self punishing, works too hard.	rarely	sometimes	often
DN	depressed, sad, resentful, rejecting.	rarely	sometimes	often
DNB	alienated, quits, withdraws.	rarely	sometimes	often
DB	afraid to try, doubts own ability.	rarely	sometimes	often
DPB	quietly happy just to be with others.	rarely	sometimes	often
D	passive, introverted, says little.	rarely	sometimes	often

People differ in the ways that they think about those with whom they work. This may be important in working with others.

Think of the person with whom you can work <u>least well.</u> This may be someone you work with now, or someone you knew in the past. It is not necessarily someone in the group you are with at the moment.

This person does not have to be the person that you <u>like</u> least well, but should be the person with whom you had the most difficulty in getting a job done.

Describe this person as he or she appears to you. <u>Please give your immediate first reaction.</u>

To indicate your answer, simply put a slash across the scale where you think appropriate. <u>Please be sure that your answer cuts the scale clearly at a definite point.</u>

There are 16 descriptions below, please complete them all.

EFFICIENT	———————————	INEFFICIENT
UNPLEASANT	———————————	PLEASANT
HELPFUL	———————————	FRUSTRATING
PRODUCTIVE	———————————	UNPRODUCTIVE
UNFRIENDLY	———————————	FRIENDLY
CONSIDERATE	———————————	INCONSIDERATE
ADVENTUROUS	———————————	UNADVENTUROUS
COLD	———————————	WARM
RELIABLE	———————————	UNRELIABLE
AMBITIOUS	———————————	UNAMBITIOUS
GLOOMY	———————————	CHEERFUL
CLOSE	———————————	DISTANT
ENTERPRISING	———————————	UNENTERPRISING
CARELESS	———————————	CAREFUL
OPEN	———————————	GUARDED
INTERESTING	———————————	UNINTERESTING

Now we would like you to describe the person with whom you can work least well, using the descriptions below.

To complete your description simply circle or highlight the choice which best fits the person you are describing, on each item. There are 26 descriptions altogether, please complete them all.When you have finished you should have a complete description consisting of ratings on all 26 items.

U	active, dominant, talks a lot.	rarely	sometimes	often
UP	extroverted, outgoing, positive.	rarely	sometimes	often
UPF	a purposeful democratic leader.	rarely	sometimes	often
UF	an assertive business-like manager.	rarely	sometimes	often
UNF	authoritarian, controlling, disapproving.	rarely	sometimes	often
UN	domineering, tough-minded, powerful.	rarely	sometimes	often
UNB	provocative, egocentric, shows off.	rarely	sometimes	often
UB	jokes around, expressive, dramatic.	rarely	sometimes	often
UPB	entertaining, sociable, smiling, warm.	rarely	sometimes	often
P	friendly, equalitarian.	rarely	sometimes	often
PF	works co-operatively with others.	rarely	sometimes	often
F	analytical, task-oriented, problem-solving.	rarely	sometimes	often
NF	legalistic, has to be right.	rarely	sometimes	often
N	unfriendly, negativistic.	rarely	sometimes	often
NB	irritable, cynical, won't co-operate.	rarely	sometimes	often
B	shows feelings and emotions.	rarely	sometimes	often
PB	affectionate, likeable, fun to be with.	rarely	sometimes	often
DP	looks up to others, appreciative, trustful.	rarely	sometimes	often
DPF	gentle, willing to accept responsibility.	rarely	sometimes	often
DF	obedient, works submissively.	rarely	sometimes	often
DNF	self punishing, works too hard.	rarely	sometimes	often
DN	depressed, sad, resentful, rejecting.	rarely	sometimes	often
DNB	alienated, quits, withdraws.	rarely	sometimes	often
DB	afraid to try, doubts own ability.	rarely	sometimes	often
DPB	quietly happy just to be with others.	rarely	sometimes	often
D	passive, introverted, says little.	rarely	sometimes	often

Now think of the person with whom you can work best. Again, it may be someone you work with now, or someone you knew in the past. It is not necessarily someone in the group you are with at the moment.

This person does not have to be the person you like best, but should be the one with whom you have been able to work with best.

Describe this person as he or she appears to you. Please give your immediate first reaction.

Remember, please give an answer on all 16 items.

EFFICIENT	———————	INEFFICIENT
UNPLEASANT	———————	PLEASANT
HELPFUL	———————	FRUSTRATING
PRODUCTIVE	———————	UNPRODUCTIVE
UNFRIENDLY	———————	FRIENDLY
CONSIDERATE	———————	INCONSIDERATE
ADVENTUROUS	———————	UNADVENTUROUS
COLD	———————	WARM
RELIABLE	———————	UNRELIABLE
AMBITIOUS	———————	UNAMBITIOUS
GLOOMY	———————	CHEERFUL
CLOSE	———————	DISTANT
ENTERPRISING	———————	UNENTERPRISING
CARELESS	———————	CAREFUL
OPEN	———————	GUARDED
INTERESTING	———————	UNINTERESTING

Section 3: LPC/MPC (SYMLOG-B)

Now, please describe the person with whom you work best, using the descriptions below.

Remember, complete your description by circling or highlighting the choice which best fits the person you are describing, on each item.

Please remember to complete all 26 items.

U	active, dominant, talks a lot.	rarely	sometimes	often
UP	extroverted, outgoing, positive.	rarely	sometimes	often
UPF	a purposeful democratic leader.	rarely	sometimes	often
UF	an assertive business-like manager.	rarely	sometimes	often
UNF	authoritarian, controlling, disapproving.	rarely	sometimes	often
UN	domineering, tough-minded, powerful.	rarely	sometimes	often
UNB	provocative, egocentric, shows off.	rarely	sometimes	often
UB	jokes around, expressive, dramatic.	rarely	sometimes	often
UPB	entertaining, sociable, smiling, warm.	rarely	sometimes	often
P	friendly, equalitarian.	rarely	sometimes	often
PF	works co-operatively with others.	rarely	sometimes	often
F	analytical, task-oriented, problem-solving.	rarely	sometimes	often
NF	legalistic, has to be right.	rarely	sometimes	often
N	unfriendly, negativistic.	rarely	sometimes	often
NB	irritable, cynical, won't co-operate.	rarely	sometimes	often
B	shows feelings and emotions.	rarely	sometimes	often
PB	affectionate, likeable, fun to be with.	rarely	sometimes	often
DP	looks up to others, appreciative, trustful.	rarely	sometimes	often
DPF	gentle, willing to accept responsibility.	rarely	sometimes	often
DF	obedient, works submissively.	rarely	sometimes	often
DNF	self punishing, works too hard.	rarely	sometimes	often
DN	depressed, sad, resentful, rejecting.	rarely	sometimes	often
DNB	alienated, quits, withdraws.	rarely	sometimes	often
DB	afraid to try, doubts own ability.	rarely	sometimes	often
DPB	quietly happy just to be with others.	rarely	sometimes	often
D	passive, introverted, says little.	rarely	sometimes	often

THANKYOU ONCE AGAIN FOR YOUR CO-OPERATION.

(3e):9:8:85. SSQ (Warw. II)/Pre. 12

APPENDIX G: THE SMALL GROUPS QUESTIONNAIRE (SGQ).
PART TWO: The Postsession Questions.

DESCRIPTION OF PROCEDURE. 532

SOCIOMETRIC SCALES. 534

ATTITUDE SCALES. 548

SYMLOG INTERPERSONAL RATINGS SCALES (Behaviour). 550

The University of Aston
Management Centre.

For office use only.

Date:____/____/____

Series:_____

Gn:____ Sess:____ N:____

S:____ Gr:____ A:____

T:_____

A: Please put your symbol here.

SMALL GROUPS QUESTIONNAIRE.

CONFIDENTIAL

This questionnaire is the final part of the session. It is not a test; there are no right or wrong answers, and you will not be scored on your performance. We would like you simply to record your impressions of the members of your group as they behaved in the discussion in which you have just taken part.

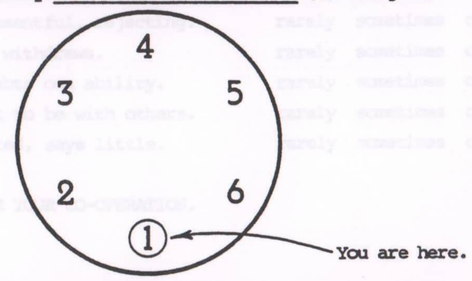
1) YOUR ANSWERS ARE CONFIDENTIAL, and the procedure has been designed to preserve your anonymity.

2) Please devise a symbol to place in the box marked "A" at the top of the page. This symbol can take any form you wish; a word, a phrase, an abstract symbol, or even, if you wish, your initials. This will become your personal identification mark for all other sessions, and you will need to remember it.

These symbols will be placed in a directory under your group, not under your name, and will help us to arrange the information so that we can put together the results we get from this session with descriptions from past or future sessions.

TO COMPLETE THE QUESTIONNAIRE.

Please adopt the following procedure: consider yourself as group member number 1. The remaining members of your group will then be numbered consecutively in a clockwise direction (see diagram).



Thus, the person on your immediate left is number two, and so on. For instance, if your group consists of 5 people, then the

person immediately on your left will be person number 2, and the person immediately on your right will be person number 5.

AS YOU COMPLETE THIS QUESTIONNAIRE:

1) PLEASE DO NOT REFER TO YOUR EARLIER ANSWERS. We are interested in your immediate, first recollections.

2) PLEASE DO NOT CONFER WITH OTHER GROUP MEMBERS AS YOU COMPLETE THIS QUESTIONNAIRE. It is your impressions which are important.

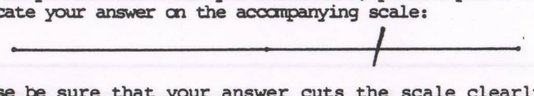
3) Please do not start until you are sure what to do. If you are uncertain, at any point, please ask.

HOW TO USE THE SCALES.

1) Read the first question carefully, being careful to note the descriptions at the top of the scale.

2) Broadly speaking, there are three kinds of questions; how much; how good; and how effective.

3) When you are sure that you understand, please put a slash to indicate your answer on the accompanying scale:



Please be sure that your answer cuts the scale clearly, at a definite point.

4) Please answer each question as quickly and as carefully as you can. However, this is not a time trial so please take as much time as you need.

5). Repeat the procedure until you have completed each section of each answer. PLEASE BE SURE TO CHECK THE DESCRIPTIONS AT THE TOP OF EACH SCALE VERY CAREFULLY.

THANKYOU VERY MUCH FOR YOUR CO-OPERATION.

If you are clear about what we would like you to do, please begin with the first scale overleaf.

(3e):9.8.85. SGQ (Warw.II). 2

Qu.1. HOW MUCH talking did each member of the group do? Include yourself. (Remember, you are number 1).

	Talked very little	Talked a lot
1		
2		
3		
4		
5		
6		
7		
8		

AS YOU ANSWER THE QUESTIONS:

If you have any comments which you think are important or interesting, please write them next to the appropriate question, or on the back of the last sheet.

Now, if you are quite clear about what we would like you to do, please turn to the next page.

Qu.2) When a group is trying to solve a problem, some people might contribute better ideas than others. Forget the number of ideas they contributed, HOW GOOD were the ideas of the people in your group (including your own)?

	Not very good	Very good indeed
1		
2		
3		
4		
5		
6		
7		
8		

Qu.3. Although a person may contribute very good ideas, it may be that they don't produce very many of them. HOW MANY good ideas which were useful for solving problems did each member of the group (including yourself) contribute?

	None	Lots
1		
2		
3		
4		
5		
6		
7		
8		

Qu.4a. HOW MUCH did you, or anyone else, try to guide the discussion and keep it moving effectively?

	Not at all	Very much
1		
2		
3		
4		
5		
6		
7		
8		

Qu.4b. HOW USEFUL were these attempts?

	Not useful at all.	Very useful
1		
2		
3		
4		
5		
6		
7		
8		

Qu.5. Regardless of how valuable you felt they were to the group, how well do you personally like each of the other members of the group?

	Not very much	Very much indeed
1		
2		
3		
4		
5		
6		
7		
8		

Qu.6. HOW EFFECTIVE was each each member of the group (including yourself) in getting the discussion to the point by providing clarification, getting terms defined and pointing out logical difficulties?

	Not effective at all	Very effective
1		
2		
3		
4		
5		
6		
7		
8		

Qu.7. In your opinion, HOW MUCH help COULD each member of the group (including yourself) have been in solving the problem?

	Not a lot	A lot
1		
2		
3		
4		
5		
6		
7		
8		

Qu.8. TO WHAT EXTENT do you find qualities in other members of the group which you personally dislike or which seem to irritate you?

	Disliked a lot	Disliked very little
1		
2		
3		
4		
5		
6		
7		
8		

Qu.9. Did you, or anyone else, appear to have any hurt feelings as a result of the discussion?

Please write yes or no here:_____

IF YOUR ANSWER IS YES, please answer the following questions. IF NO, go on to question 10.

Qu.9a. Who seemed to have hurt feelings? Please give a rating for everyone, including yourself.

	Seemed not to have any hurt feelings	Seemed to be very upset
1		
2		
3		
4		
5		
6		
7		
8		

Qu.9b. Did anyone ATTEMPT to soothe these hurt feelings? Please give a rating for everyone, including yourself.

	Made no attempt at all	Made many attempts
1		
2		
3		
4		
5		
6		
7		
8		

Qu.9c. HOW EFFECTIVE were these attempts?

	Not at all effective	Very effective
1		
2		
3		
4		
5		
6		
7		
8		

Qu.10. TO WHAT EXTENT did any person try to dominate the proceedings (including yourself)?

	Not at all	Very much
1		
2		
3		
4		
5		
6		
7		
8		

Qu.11. Was there any joking, kidding or humour during the discussion?

Yes or no:____

IF YES, please answer the next question. IF NO, go on to question 12.

Qu.11a. HOW MUCH joking and kidding did each person (including yourself) do?

	None at all	A lot
1		
2		
3		
4		
5		
6		
7		
8		

Qu.12. Did anyone contribute less to the discussion than you would have liked (including yourself)? Please give a rating for each person.

	Contributed much less than desired	Didn't contribute less than desired
1		
2		
3		
4		
5		
6		
7		
8		

Qu.13. If a similar session were to be conducted with the same group, HOW ACTIVE would you WISH each member to be (including yourself)?

	Not active at all	Very active
1		
2		
3		
4		
5		
6		
7		
8		

Qu.14. If a similar session were to be conducted with the same group, HOW ACTIVE do you think each member WOULD BE (including yourself)?

	Not active at all	Very active
1		
2		
3		
4		
5		
6		
7		
8		

Qu. 15. Did anyone in the group (including yourself) talk too much in the discussion, perhaps stopping others from contributing? Please give a rating for each person.

	Didn't talk too much	Talked far too much
1		
2		
3		
4		
5		
6		
7		
8		

Qu.16. Occasionally in group discussions, some people withdraw from the conversation and become quiet. Ignoring the reasons why, to what extent did each member of the group (including yourself) become quiet and withdrawn?

	Withdrew a great deal	Hardly withdrew at all
1		
2		
3		
4		
5		
6		
7		
8		

Qu.17. During group activities some people might try to become more influential than others; they might be successful, they might not.

Qu.17a. HOW MANY ATTEMPTS did each member of the group (including yourself) make to try and influence the group's opinion?

	Made no attempts	Made many attempts
1		
2		
3		
4		
5		
6		
7		
8		

Qu.17b. HOW SUCCESSFUL was each member of the group (including yourself) in influencing the group's opinion?7

	Not at all successful	Very successful
1		
2		
3		
4		
5		
6		
7		
8		

Qu.18. Occasionally in group activities people may show hostility and aggression; sometimes for good reasons and sometimes not. Forget the reasons why, did you, or anyone else,show any hostility?

Yes or no:____

IF YES, please answer the following questions. IF NO go on to question 19.

Qu.18a. HOW MUCH hostility did each person show (including yourself)?

	Showed a lot of hostility	Showed no hostility
1		
2		
3		
4		
5		
6		
7		
8		

Qu.18b. Did anyone (including yourself) TRY to calm the hostility? Please give a rating for each person.

	Made no attempt at all	Made many attempts
1		
2		
3		
4		
5		
6		
7		
8		

Qu.18c. HOW SUCCESSFUL were the attempts to calm the hostility?

	Not at all successful	Very successful
1		
2		
3		
4		
5		
6		
7		
8		

Qu.19. If, in a future session, the group had to tackle a similar problem, WHO WOULD YOU CHOOSE to take part with you?

	Not at all	Very much
1		
2		
3		
4		
5		
6		
7		
8		

Qu.20. During group activities some people might try to keep relations between group members cordial and friendly; they might be successful, they might not.

Qu.20a. HOW MUCH did each member of the group (including yourself) TRY to keep relations between members cordial and friendly?

	Not at all	Very much
1		
2		
3		
4		
5		
6		
7		
8		

Qu.20b. TO WHAT EXTENT was each member of the group (including yourself) SUCCESSFUL in keeping the relationship between members cordial and friendly?

	Not at all	Very much
1		
2		
3		
4		
5		
6		
7		
8		

Qu.21. Given a similar problem, if you were to be moved to another group, how would you feel?

Very unhappy — Very happy

Qu.22. Given the choice, how likely would it be that you would attend further meetings of this group?

Very unlikely — Very likely

Qu.23. Did you ever feel that you were denied the opportunity to communicate and contribute to the discussion?

Often — Never

Qu.24. Did you find the session interesting?

Not at all — Very much

Qu.25. Were you satisfied with the conclusions reached by the group?

Not at all — Very satisfied

Qu.26. Did you personally feel that you had any responsibilty to engage in the group discussion?

Not at all — A great deal

Qu.27. Were you satisfied with the way the topic was discussed?

Not at all — Very satisfied

Qu.28. How would you feel if asked to take part in a similar session?

Not interested — Very interested

Qu.29. If this were to be the last meeting of this group, how would you feel?

Very happy — Very unhappy

Qu.30. How interesting did you find the topic that you were discussing?

Not at all — Very interesting

Qu.31. Did you find the session enjoyable?

Not at all — Very much

In this section we would like you to describe how each member of your group (including yourself) behaved during the discussion, using the descriptions overleaf.

To complete your description simply circle or highlight the choice which best fits the person you are describing, ON EACH ITEM.

There are 26 descriptions altogether, please complete them all. When you have finished you should have a seperate description for each member of your group (including yourself), each complete description consisting of ratings on all 26 items.

PLEASE USE A SEPERATE SHEET FOR EACH PERSON DESCRIBED.

If you understand what we would like you to do, please turn over.

Indicate which person you are describing by writing their number in this space:_____. (Please start with yourself).

U	active, dominant, talks a lot.	rarely	sometimes	often
UP	extroverted, outgoing, positive.	rarely	sometimes	often
UPF	a purposeful democratic leader.	rarely	sometimes	often
UF	an assertive business-like manager.	rarely	sometimes	often
UNF	authoritarian, controlling, disapproving.	rarely	sometimes	often
UN	domineering, tough-minded, powerful.	rarely	sometimes	often
UNB	provocative, egocentric, shows off.	rarely	sometimes	often
UB	jokes around, expressive, dramatic.	rarely	sometimes	often
UPB	entertaining, sociable, smiling, warm.	rarely	sometimes	often
P	friendly, equalitarian.	rarely	sometimes	often
PF	works co-operatively with others.	rarely	sometimes	often
F	analytical, task-oriented, problem-solving.	rarely	sometimes	often
NF	legalistic, has to be right.	rarely	sometimes	often
N	unfriendly, negativistic.	rarely	sometimes	often
NB	irritable, cynical, won't co-operate.	rarely	sometimes	often
B	shows feelings and emotions.	rarely	sometimes	often
PB	affectionate, likeable, fun to be with.	rarely	sometimes	often
DP	looks up to others, appreciative, trustful.	rarely	sometimes	often
DPF	gentle, willing to accept responsibility.	rarely	sometimes	often
DF	obedient, works submissively.	rarely	sometimes	often
DNF	self punishing, works too hard.	rarely	sometimes	often
DN	depressed, sad, resentful, rejecting.	rarely	sometimes	often
DNB	alienated, quits, withdraws.	rarely	sometimes	often
DB	afraid to try, doubts own ability.	rarely	sometimes	often
DPB	quietly happy just to be with others.	rarely	sometimes	often
D	passive, introverted, says little.	rarely	sometimes	often

Now, please continue with the remaining members of your group.

Remember, please complete all 26 items.

Indicate which person you are describing by writing their number in this space:_____.

U	active, dominant, talks a lot.	rarely	sometimes	often
UP	extroverted, outgoing, positive.	rarely	sometimes	often
UPF	a purposeful democratic leader.	rarely	sometimes	often
UF	an assertive business-like manager.	rarely	sometimes	often
UNF	authoritarian, controlling, disapproving.	rarely	sometimes	often
UN	domineering, tough-minded, powerful.	rarely	sometimes	often
UNB	provocative, egocentric, shows off.	rarely	sometimes	often
UB	jokes around, expressive, dramatic.	rarely	sometimes	often
UPB	entertaining, sociable, smiling, warm.	rarely	sometimes	often
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PF	works co-operatively with others.	rarely	sometimes	often
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DPF	gentle, willing to accept responsibility.	rarely	sometimes	often
DF	obedient, works submissively.	rarely	sometimes	often
DNF	self punishing, works too hard.	rarely	sometimes	often
DN	depressed, sad, resentful, rejecting.	rarely	sometimes	often
DNB	alienated, quits, withdraws.	rarely	sometimes	often
DB	afraid to try, doubts own ability.	rarely	sometimes	often
DPB	quietly happy just to be with others.	rarely	sometimes	often
D	passive, introverted, says little.	rarely	sometimes	often

(3e):9:8:85. SGQ (Warw. II)

APPENDIX H: DATA COLLATION SHEETS.

METHOD RECORD SHEET FOR SINGLE GROUPS.	554
SYMBOL SYSTEM KET.	555
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METHOD RECORD SHEET (Version 2).

Series:_____Gn:_____N:____Session:____Date of session:__/__/__

1. SUBJECTS. Number:____male;____female. $\overline{X}$

Age; M:__:__:__:__:__:__:__:__:__:__:__:__:__:__:__:__:____

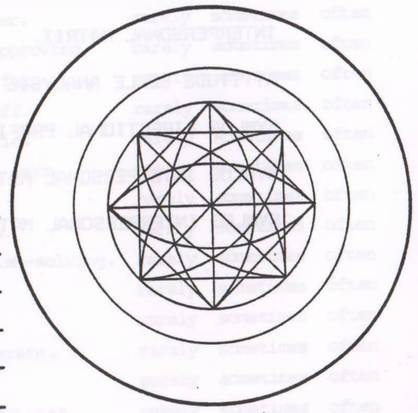
F:__:__:__:__:__:__:__:__:__:__:__:__:__:__:__:__:____

Overall $\overline{X}$:____

Description:_____

2. GROUP LAYOUT AND COMPOSITION.

NOTES:_____



3.MATERIALS:_____

4.PROCEDURE:_____

(MRS/V2/XI84)

SYMBOL SYSTEM KEY. Series_____Date__/__/__

Gp.No.

S:						
A						
B						
C						
D						
E						
F						
G						
H						

(SSK/V1/X84)

RAW DATA RECORD: BELBIN SELF PERCEPTION INVENTORY (S.P.I) ANALYSIS SHEET.

Series:_____Gn:_____SN:____Session:____Date of session:__/__/__

Section	CW		CH		SH		PL		RI		ME		TW		CF	
I	g		d		f		c		a		h		b		e	
II	a		b		e		g		c		d		f		h	
III	h		a		c		d		f		g		e		b	
IV	d		h		b		e		g		c		a		f	
V	b		f		d		h		e		a		c		g	
VI	f		c		g		a		h		e		b		d	
VII	e		g		ā		f		d		b		h		c	
TOTAL																

Primary Team Role 1:_____

2:_____

Back-up Team Roles 3:_____

4:_____

5:_____

6:_____

7:_____

Possible areas of weakness 8:_____

KEY: CW: Company Worker CH: Chairman
SH: Shaper PL: Plant
RI: Resource Investigator ME: Monitor Evaluator
TW: Team Worker CF: Completer Finisher

(RDRSPI/V1/X84)

RAW DATA RECORD: LPC/MPC (Version 2).

Series:_____Gn:_____N:____Session:____Date of session:__/__/__

Subject no.		LPC	MPC	d	d^2	LPC	MPC	d	d^2	LPC	MPC	d	d^2	LPC	MPC	d	d^2
EFFICIENT	-																
UNPLEASANT	+																
HELPFUL	-																
PRODUCTIVE	-																
UNFRIENDLY	+																
CONSIDERATE	-																
ADVENTUROUS	-																
COLD	+																
RELIABLE	-																
AMBITIOUS	-																
GLOOMY	+																
CLOSE	-																
ENTERPRISING	-																
CARELESS	+																
OPEN	-																
INTERESTING	-																
T																	
$\bar{X}$																	
SD																	

Figures expressed in cm/mm; other, description:_____

(RDRASO/V2/X84)

RAW DATA RECORD: WHO-WHOM MATRIX, Version 2 (Warwick Q, 1 & 2).

Series:_____Gn:_____N:____Session:____Date of session:__/__/__

Qu:____Description:_____

From whom \ To whom	S	1	2	3	4	5	6	7	8	T	$\bar{X}$	SD	Minus self rating T	$\bar{X}$	SD
	1														
	2														
	3														
	4														
	5														
	6														
	7														
	8														
	T														
	$\bar{X}$														
	SD														
	R														
Minus self rating	T														
	$\bar{X}$														
	SD														
	R														

Figures expressed in cm/mm; ranks; deviation from row mean (with/without SR);
other, description:_____

NOTES:

(RDRWQ/V2/X84)

RAW DATA RECORD: ATTITUDE SCALES (WARWICK Q, 1 & 2); OPS; ZEI.

Series:_____Gn:_____N:____Session:____Date of session:__/__/__

Qu.No.	Desc.	R	R	R	R	R	R	R	R	R	T	$\bar{X}$	SD
	S: 1												
	2												
	3												
	4												
	5												
	6												
	7												
	8												
	T												
	$\bar{X}$												
	SD												

Figures expressed in cm/mm; other, description:_____

(RDRAS/V2/X84)

RAW DATA RECORD: SYMLOG DIRECTIONAL PROFILE FORM, Describing: B/V. S.No.:____

Series:_____Gn:_____N:____Session:____Date of session:__/__/__

Rating of

S	1	2	3	4	5	6	7	8
U								
UP								
UPF								
UF								
UNF								
UN								
UNB								
UB								
UPB								
P								
PF								
F								
NF								
N								
NB								
B								
PB								
DP								
DPF								
DF								
DNF								
DN								
DNB								
DB								
DPB								
D								
Totals U								
D								
P								
N								
F								
B								

(SDPF/U2/X84)

SYMLOG INTERPERSONAL MATRIX FORM, Describing: B/V.

Series:_____Gn:_____N:____Session:____Date of session:__/__/__

To Whom

From Whom	S	U	D	P	N	F	B
	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						

(SIMF/U2/X84)

SYMLOG INTERPERSONAL MATRIX FORM (Totals), Describing B/V.

Series:_____Gn:_____N:____Session:____Date of session:__/__/__

Part 1: Totals including Self Ratings

S	1		2		3		4		5		6		7		8	
U																
D																
P																
N																
F																
B																

Part 2: Totals excluding Self Ratings

S	1		2		3		4		5		6		7		8	
U																
D																
P																
N																
F																
B																

(SIMF-T/V2/X84)

APPENDIX I: UPPER LIMITS OF SYMLOG DIMENSIONS.

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1. INTRODUCTION.

In chapter 2 it was pointed out that due to the interdependence built in to the SYMLOG dimensions, as implemented in the SYMLOG Adjective Ratings Scales, it was impossible for anyone to give or receive maximum ratings on all dimensions simultaneously. That is to say, no-one can give or receive a rating of, for example, 18U, 18P, 18F (see pp 86 - 89 above). This appendix is an expansion of that point. Here are presented the numerical limits of the SYMLOG dimensions, in both tabular form and plotted on a SYMLOG Field Diagram.

Because of the multi-faceted nature of SYMLOG some care needs to be taken with terminology if confusion is to be avoided, so for the purposes of this discussion the following stipulative definitions will be used.

1) The SYMLOG **Dimensions** are: U - D (Up - Down); P - N (Positive - Negative); F - B (Forward - Backward).

2) Because these dimensions are bi-directional, that is having a positive direction and a negative direction balanced symmetrically about a zero point, then the term **direction** will be used to indicate any of U, D, P, N, F, or B.

   The **positive** directions are U, P, and F, and the **negative** or **contrary** directions are D, N, and B.

Occasionally an alternative construction will be used, to the effect that dimension x - y takes on values of ± n. This is completely consistent with the definitions above; if for example it is stated that dimension U - D can take on values of ±18, then this is stating no more than the proposition that the dimension U - D runs from 18U (+18) to 18D (-18).

3) The term **dimensional label**, **directional label**, or simply **label**, refers to the set of 26 letter clusters appearing in the left hand column of the SYMLOG Adjective Rating Form (see appendices E, F, & G).

These labels constitute a systematic and exhaustive sorting of dimensional directions in groups of 1, 2, or 3. The adjective clusters which accompany these labels have been selected to reflect the kinds of overt behaviour which Bales and his colleagues consider to be appropriate to the indicated position within the SYMLOG space. Thus the adjectives alongside UPF have been chosen to indicate dominant, friendly and instrumental behaviours (see Bales et al., 1979: appendix A, pp 355 - 386; appendix C, pp 392 - 395).

2. METHOD.

Values for the numerical limits were derived from a systematic maximisation of selected directions within the SYMLOG dimensions. This was a three stage operation, followed by an extrapolation to provide the limits in extension, that is, to give a complete enumeration of the parameters derived from maximisation. It should

be noted, however, that a complete ennumeration of all parameters has not been attempted here, first because the essential point of the exercise can be made without it, and second because of diminishing returns. Beyond simple maximisation procedures, the exercise becomes more complex, and the overall contribution to the thesis becomes much less.

a) Stage 1: Maximisation of one dimension.

The first step in this stage was to give one direction a maximum score of 18. In this case direction U in the dimension U - D was selected, but the selection was arbitrary; because of the symmetry of the relationships between the dimensions, any dimension, and any direction within that dimension, could have been selected. The numerical values would have been the same, although, of course, they would have been assigned to different directions.

The maximisation of a particular direction is simple; it involves scoring 2 where that direction is indicated, and 0 where its contrary is indicated. Thus, the dimension U-D has the two directions U (for Up) and D (for Down). To maximise U all adjectives having a designation U, singly or in combination, are given 2, and all adjectives with a designation containing D are given 0. Necessarily, this operation limits the maximum score that may be assigned to the other dimensions. As noted above, however, the point of this exercise is to discover the extent to which the limitation occurs.

The next step, after the maximisation of one dimension, was to maximise one of the two remaining dimensions using those label clusters left over. The principle is the same as that described above, although the number of appropriate labels left is of course reduced. In this step the direction P, from the dimension P - N, was selected for constrained secondary maximisation.

Finally in this stage, the remaining dimension (F - B) was given tertiary maximisation in the direction F. Again the principle here is the same as that described above. Of the remaining labels those with ascriptions containing F were given 2 points, and those with ascriptions containing B were given 0.

A variation used in this stage involved the maximisation of the U - D dimension in the U direction, followed by the simultaneous maximisation of the remaining two directions as follows: P - N in the N direction and F - B in the B direction. Details of this operation are the same as those for stage 2, except that the simultaneous maximisation is accomplished last instead of first (see table I.1. below).

b) Stage 2: Simultaneous maximisation of two dimensions.

In this stage two dimensions were selected for simultaneous maximisation. These were U - D in the U direction, and P - N in the P direction. Again, the same principle outlined above was observed, although in this case directional labels containing both U and P were assigned a value of 2, and all of those containing the con-

traries D and N, even those that also had one of the selected directions (e.g. UNF, DPF), were given 0.

Finally in this stage the dimension F - B was maximised in the direction F using what was left (see tables I.1. and I.2. below).

Table I.1. Distribution of scores given to the SYMLOG Dimensions, tabulated by Directional Labels.

Directional Label	Stage 1 Maximise U (a)	Stage 1 Maximise U (b)	Stage 2 Maximise U & P	Stage 3 Maximise U, P & F
U	2	2	2	2
UP	2	2	2	2
UPF	2	2	2	2
UF	2	2	2	2
UNF	2	2	0	0
UN	2	2	0	0
UNB	2	2	0	0
UB	2	2	2	0
UPB	2	2	2	0
P	2	2	2	2
PF	2	2	2	2
F	2	2	2	2
NF	0	0	0	0
N	0	0	0	0
NB	0	0	0	0
B	0	0	0	0
PB	2	0	2	0
DP	0	0	0	0
DPF	0	0	0	0
DF	0	0	0	0
DNF	0	0	0	0
DN	0	0	0	0
DNB	0	0	0	0
DB	0	0	0	0
DPB	0	0	0	0
D	0	0	0	0

KEY: Stage 1, a: Maximise U - D in the U direction; then maximise P - N in the N direction; then maximise F - B in the F direction.

Stage 1, b: Maximise U - D in the U direction; then simultaneously maximise P - N in the N direction and F - B in the F direction.

Stage 2: Simultaneously maximise U - D in the D direction and P - N in the P direction; then maximise F - B in the F direction.

Stage 2: Simultaneously maximise U - D in the U direction; P - N in the N direction; and F- B in the F direction.

The left hand column of table I.1 is taken directly from the SYMLOG Adjective Rating Form (see Bales et al., 1979, appendix C, pp 392 - 395. See also appendices E - H in this volume).

c) Stage 3: Simultaneous maximisation of three dimensions.

In this stage all three dimensions were maximised as follows: U - D in the U direction; P - N in the P direction; F - B in the F direction. For this stage only those labels containing the selected directions were given a score of 2, and all of those containing any of the contraries were given 0. This is made clearer in table I.1., and the results are given in table I.2.

3. RESULTS.

SYMLOG totals are derived as follows. First the totals for the positive directions U, P, F, and the negative directions, D, N, B, are tabulated separately. The latter is then subtracted from the former, which gives an overall total, together with net direction. This can be accomplished by hand using a scoring overlay (see Bales et al., 1979: appendix H, pp 418 - 419). For present purposes, however, they were derived via the computer programme Doormat (see appendices K & L in this volume). The results are given in table I.2. below.

Table I.2. SYMLOG Maximum Values: Totals derived from systematic maximisation of SYMLOG Dimensions in specified directions.

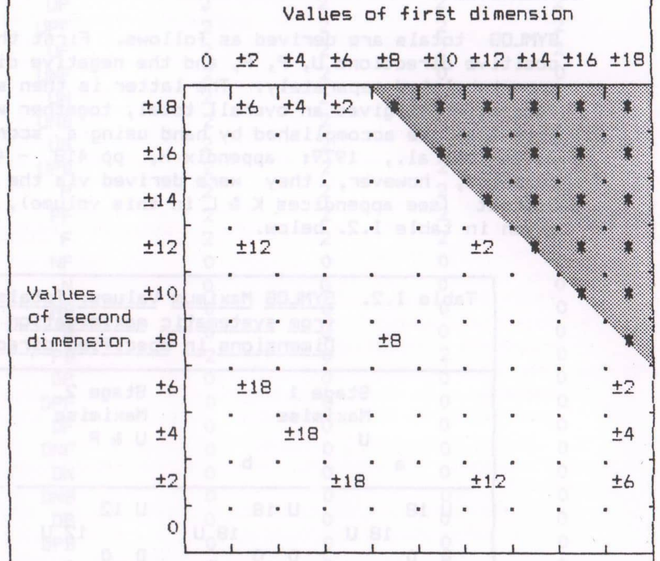
Stage 1 Maximise U (a)	Stage 1 Maximise U (b)	Stage 2 Maximise U & P	Stage 3 Maximise U, P, & F
U 18	U 18	U 12	U 8
18 U	18 U	12 U	8 U
D 0	D 0	D 0	D 0
P 12	P 10	P 12	P 8
6 P	4 P	12 P	8 P
N 6	N 6	N 0	N 0
F 10	F 10	F 8	F 8
2 F	4 F	2 F	8 F
B 8	B 6	B 6	B 0

KEY: See table I.1. above.

The numerical values reported in table I.2. are not, of course, restricted to the directions U, P, and F in the manner shown, but, for the moment, the discussion will be kept to that particular

presentation. It will be noted here that when the direction U is assigned the maximum value 18, the highest value that P can attain when given secondary maximisation is 6, that is to say **less than half way along the scale**. Even more severe, when P is given secondary maximisation, F is restricted to a **highest possible value** of 2, which represents very little deviation from 0. The situation is hardly better when the two directions P and F are simultaneously given secondary maximisation; both attain, as a highest possible value, only 4, which, on a scale of 0 - 18, is a very small value. Thus it is the nature of the SYMLOG dimensions that when U is given a maximum value the degrees of freedom of the other two dimensions are very restricted indeed.

Figure I.1. SYMLOG Maximum Values: Values derived by direct substitution.



KEY: * = "Impossible cell".

This figure shows the values that SYMLOG Dimensions may take. If the values of two of the dimensions are known, then the maximum value that the third dimension can take is shown at the intersection. The "impossible cells" indicate areas where if one dimension takes on a specified value, then the second one cannot take on a value indicated by the scale at the top or the left. For example, if the first dimension takes on a value of ±18, then the second and third dimensions cannot take on values between 8 and 18 in any direction.

It will also be noted that when all three dimensions are maximised simultaneously, that is when none of the contrary directions have a value above zero, then the maximum possible value is only 8, which is less than half way along the scale. Again this seems to be a very severe restriction.

The symmetrical relationships between SYMLOG Dimensions, and the indicative directions within them, was noted above. What this means is that any set of totals such as those in table I.2. can be transferred by simple substitution to other combinations of dimensional directions. For example, the figures in table I.2. under the heading "Stage 1, a" indicate that when U takes on a value of 18, then the highest possible value that P can take is 12, and if it does then the highest value that F can take is 2. However, the figures can be interpreted more generally to indicate that when any dimension takes on a value of ±18, then the highest possible value that either of the two remaining dimensions can take is ±12, and if it does then the remaining dimension can take at most a value of ±2.

This property has one important consequence for the establishment of upper limits. That is that once having derived one set of values, as in table I.2 above, then a complete set of values can be derived by direct substitution. The fact that such substitutions can be made means that some of the parameters for the SYMLOG Rating Method can be established readily by direct substitution for all possible combinations. This was undertaken here, and the results are shown in figure I.1. above.

It should be noted that, although only 13 out of a possible 100 cells in figure I.1 have numerical values in them, these actually represent 104 separate data points. To see that this is so, consider that for the cell at the intersection for values ±8 the following permutations are available:

1) 8U, 8P, 8F.
2) 8U, 8P, 8B.
3) 8U, 8N, 8F.
4) 8U, 8N, 8B.
5) 8D, 8P, 8F.
6) 8D, 8P, 8B.
7) 8D, 8N, 8F.
8) 8D, 8N, 8B.

This is a simple example; for the remainder of the cells in figure I.1. the number of separate data points varies, but not straightforwardly. For example, the six cells representing values 18, 6, 2, jointly represent 48 points. It might also be noted that they convey the same information, so there is a certain amount of redundancy in the figure, although nothing very serious in terms of the present exercise.

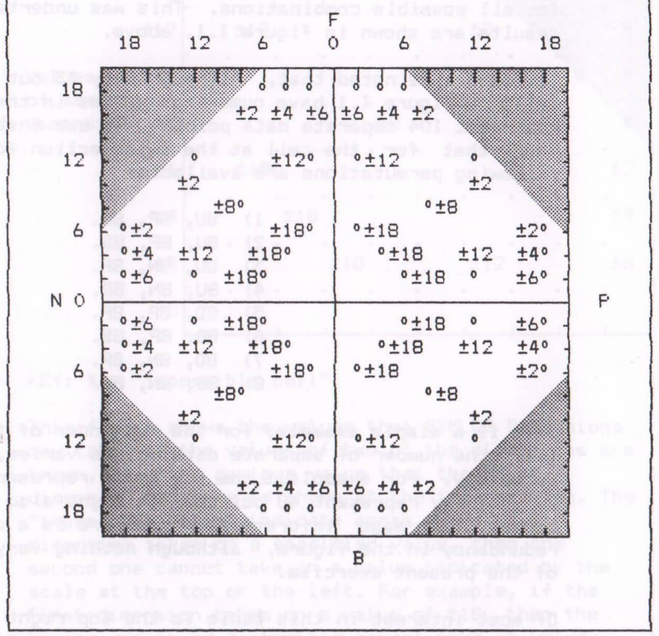
Of most interest in this table is the top right hand corner; the "impossible cells". These represent areas which cannot be completed because the attainment of any of the values specified by the scales at the top or left of the table by one dimension precludes the attainment of values indicated by the cells. For example, if one dimension was assigned the value +16, then neither

of the two other dimensions could attain any value between 10 - 18 in any direction.

It would be interesting to see how the figures developed in the bottom left hand corner, but here, as for the remaining blank cells in the matrix, deriving figures is more complex than it was in the derivation of those given. The reason for this is very straightforward. When a dimension is assigned maximum points in a specified direction, there is only one way that it can be done. When a dimension is minimised, however, that is assigned a value of 0 there are several different ways available. In point of fact there are at least 45 different ways it can be achieved, and probably more. Moreover, each different method has different implications for the remaining two dimensions.

When it comes to computing the number of different ways in which a dimension can be assigned values intermediate to 0 and those maxima already given, then the number becomes considerably larger. In terms of the present exercise, the computational complexity would be unacceptably high, and the additional information gained negligible.

Figure I.2. SYMLOG Maximum Values Plotted on a Field Diagram.



As a final part of the exercise, the figures used in the derivation of figure I.1. have been plotted on a SYMLOG Field Diagram (see figure I.2.). In point of fact this is only a partial plotting because some of the points (those involving different values for U - D) map directly onto one another. For example, the two points of the diagram denoted by the co-ordinates {18U, 6P, 2F} and {18D, 6P, 2f} appear on top of one another because, as noted in chapter 2, the diagram is a two-dimensional representation of a three-dimensional space. Again, this is not too serious for present purposes. Nevertheless, in the diagram the U - D dimension is indicated in numerical form, as in standard field diagrams, but with the notation ±n.

It will be seen at once that the pattern indicated by figure I.1. is repeated in the field diagram; there are very clearly circumscribed areas in the corners which are not attainable. The area within which the SYMLOG ratings fall appears to be octagonal, which would indicate that the operative space for SYMLOG is not a cube, but something a good deal more complex. Interestingly, one would have predicted the space to have been spherical, and perhaps if the mathematics were worked out in more detail it might well yet turn out to be.

4. DISCUSSION.

The main message of the results above is obvious; large areas of the SYMLOG space are not accessible via raw ratings derived from the SYMLOG Adjective Rating Form. Indeed, the theoretical space upon which SYMLOG is posited is not, in this instance at least, cubic as Bales et al (1979) suggest, but a more complex shape.

The extent to which this is a problem for SYMLOG as a whole is not clear, although it must be remarked that theoretically at least Bales is being consistent. For example, it is theoretically plausible that extremes of dominant and friendly behaviour will to some extent preclude task related behaviours. Moreover this sort of proposition has also received some empirical corroboration, not least in Bales own work (e.g. Bales, 1958), although it might also be remarked that a large part of this thesis has called much of this evidence into question.

Nevertheless, there are problems here. Bales discusses SYMLOG in terms of independent orthogonal axes and yet proceeds to measure group member perceptions in terms of axes which, although orthogonal, are quite clearly interdependent. He has preserved the hypothesis of contrariety which he discussed in 1956 (Bales, 1956, 1958). Moreover, although one can easily accept that behaviour of one sort will tend to reduce the extent to which behaviour of another sort can be accomplished, there is a question as to whether the extent of this sort of interaction is quite so severe as that observed in these results.

Overall, there is an inconsistency here, although quite what can be done to resolve it is not clear. What it does point to, however, is that SYMLOG still has some areas of development yet to be completed, a fact that Bales is well aware of (Bales et al., 1979: 11 - 13).

It is not altogether clear what implications these results might have for the practical use of SYMLOG, and in particular the inter-

pretation of empirical results derived from the rating scales. However, it is important that the fact that raw ratings cannot give maximum scores on all dimensions simultaneously is borne in mind when the ratings scales are being used.

Finally, one aspect to this exercise which has not been emphasised is that it has concentrated on raw scores alone. The reason for mentioning it here is that within the methods allied to the field diagrams is what is known as the expansion multiplier. This is applied to diagrams in order to expand the points within the space, and make their relationships clearer. It is therefore possible that if someone received ratings of, for example, 8U, 8P, 8F, then by application of the expansion multiplier (in this case something in the order of 2.25) the net result would be 18U, 18P, 18F, or something very close to it.

The nature of the calculations involved in deriving the expansion multiplier, however, have no mathematical properties which have any direct relevance to the interpretation of the Field Diagrams (see Bales, et al., 1979: appendix K, pp 433 - 444). The Expansion Multiplier is, in fact, a topographical modification of the distribution of the points relative to the visual area which they occupy, but not relative to the mathematical area, or the conceptual space which this is thought to denote. It simply expands the visual aspect of the points, while leaving unchanged the essential distributive relationships between them. In other words, it is simply a graphical ploy which applies a linear expansion to ink marks on a two dimensional surface. So, although something approaching maximum scores on all three dimensions simultaneously can be obtained after expansion, it is misleading. The expansion does not affect interpretation, and therefore it has no essential meaning.

APPENDIX J: SIGMA: A MEASURE OF CONCORDANCE.

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1. INTRODUCTION.

It was remarked in chapter 9 that Kendall's Coefficient of Concordance (Kendall's W) presents some problems when used to assess levels of agreement within groups. In particular, as Smith (1963) noted, when group members consistently give equal ratings to all other members, that is when there is agreement but no perceived or rated differentiation with respect to a specified sociometric scale, then Kendall's W returns a value of 0. In conventional interpretation this would, or should, be taken to indicate that there is no agreement amongst group members with respect to a derived status order. It should be remarked that this is not necessarily a problem; for some purposes a refusal to differentiate can be interpreted as a lack of agreement, particularly in cases where it is inanimate objects that are to be sorted rather than people. And it should also be remembered that Kendall developed his measure in respect of situations other than those of human groups (Kendall, 1948, 1970; Siegel, 1956). In terms of the model of "group" used in this thesis, however, the restriction imposed by Kendall's W is a problem.

Kendall's W can only be applied when there is hierarchical structuring. That is to say, if there is structuring along the lines of relative rank ordering, then Kendall's W gives a good estimate of the degree of agreement, since it offers a statistical comparison of several different sets of rankings with respect to the same objects. If this is recast in terms of human groups, however, then it implies that a group of people can only constitute a "group", as opposed to some other kind of human collectivity, if its emergent structure is hierarchical, that is, if its members are differentiated in terms of their worth and contribution. Thus, if the restrictions imposed by Kendall's W are accepted, then it implies a definition of group such that the term group necessarily implies hierarchical structure. For the purpose of this thesis, however, this is not acceptable.

Chapters 3 and 4 above present arguments in which the term "group" is defined in terms of a shared sense of social order; social order in this context including both hierarchical and isocratic forms of structure (see also chapters 1 & 2). The latter kind of structure, however, would be assigned a value of 0 by Kendall's W, and thus be excluded from consideration a priori. Therefore, Kendall's W is alone not sufficient as a measure of inter-rater agreement for the purposes of this thesis. What is required is another measure which is sensitive both to hierarchical and isocratic structures. This appendix presents such a measure called, for reasons to be given later, Sigma (σ).

The remainder of this appendix consists of a brief examination of the rationale behind Kendall's W based on mean ranks, and the presentation of an alternative rationale based on the standard deviation of sets of rankings. It is the latter which underlies Sigma. Following this is a description of the calculation of Sigma, together with its formalisation, and a short set of validations for matrices both with and without the main diagonal. Some problems of the latter are identified, and as a result a table of upper limits is given. Finally the discussion centres on the use

of Sigma as a supplementary measure to Kendall's W, rather than as a replacement. The reason for this is that within the context of this thesis, mainly because of time, it would be impossible to develop Sigma as a "stand alone" statistic, and at its present level of development it cannot be used without the backup of a well founded measure such as Kendall' W.

2. THE RATIONALE BEHIND KENDALL'S W.

Kendall's W is appropriate where n people rank k objects. The results of this process are typically presented in a k x n matrix. By definition, where a group of people are in perfect agreement as to the relative ordering of a set of objects, then each column of the k x n matrix will contain ranks of only one value. It follows, therefore, that the column totals will take values in the series: {n, 2n, 3n ... kn}, although not necessarily in that order (Siegel, 1956: 230 - 231). This is illustrated in matrix [A], below.

[A]

		Objects				
		1	2	3	...	k
Raters	1	1	2	3	...	k
	2	1	2	3	...	k
	3	1	2	3	...	k
	.					
	.					
	.					
	n	1	2	3	...	k
Total		n	2n	3n	...	kn
Mean		1	2	3	...	k

This can perhaps be illustrated more clearly by means of a concrete example. Since the thesis is concerned almost exclusively with square matrices, that is where k = n, the examples that follow will all be of square matrices, based loosely around the idea of interpersonal sociometric evaluation. Nevertheless, the discussion could be extended to rectangular matrices without too much difficulty. For the purpose of the following examples consider a situation where five people rank order each other with respect to some sociometric criterion, Liking, for example. Matrix [B] illustrates the result when all of these agree with one another as to their relative rank ordering:

[B]

Raters \ Ratees	1	2	3	4	5
1	1	2	3	4	5
2	1	2	3	4	5
3	1	2	3	4	5
4	1	2	3	4	5
5	1	2	3	4	5
Total	5	10	15	20	25
Mean	1	2	3	4	5

In this example n = 5, and it will be noted that the column totals do indeed follow the series {n, 2n ...}, as mentioned previously.

Conversely, when there is no agreement amongst assigned rankings within the matrix, then the column totals, in a rectangular matrix, will all approximate the same value (Siegel, 1956: 230 - 231). In a square matrix they will all take the same value. In point of fact this value will be equal to:

[2] ΣR_i

which, because the maximum rank that can be assigned in a square matrix is equal to n, is equivalent to:

[3] $(1 + 2 + 3 + \ldots + n)$

Thus, in a 5 x 5 matrix where the rankings are in total disagreement, the column totals will all be equal to (5 + 4 + 3 + 2 + 1) = 15. This is illustrated in matrix [C].

[C]

Raters \ Ratees	1	2	3	4	5
1	1	2	3	4	5
2	5	1	2	3	4
3	4	5	1	2	3
4	3	4	5	1	2
5	2	3	4	5	1
Total	15	15	15	15	15

The means by which Kendall takes these pieces of information, and uses them to derive his coefficient of concordance, is not really relevant here (see Siegel, 1956: 229 - 232 for an account). What is relevant, however, is that it becomes plain why a matrix of

rankings which do not sort objects or people into a hierarchical structure, that is a matrix of equal rankings, will return a value of zero like a matrix demonstrating disagreement (see matrix [D]).

[D]

Raters \ Ratees	1	2	3	4	5
1	3	3	3	3	3
2	3	3	3	3	3
3	3	3	3	3	3
4	3	3	3	3	3
5	3	3	3	3	3
Total	15	15	15	15	15

It will be noted that the vector of column totals for matrix [D] is exactly the same as that for matrix [C]. Since it is this set of figures which Kendall's W uses to derive its result, then it treats the two matrices as equivalent, even though in psychological terms they are quite different. This becomes a problem if one wishes to retain the idea of equal ranking as a possible empirical alternative to hierarchical differentiation. Thus, some other measure is obviously necessary. The suggestion to be made here, which developed out of earlier work (Prince, 1983), is that as an alternative to using column totals as the basis of a measure of concordance, one could instead make use of the standard deviations of the ranks within the columns.

3. DEFINITIONS.

At this point it might be useful to consider, in formal terms, what it is that an alternative measure would be used to evaluate, that is, it would be helpful to identify "criterial situations". It would also be helpful to construct some basic requirements of the statistic itself. To this end some formal definitions are in order, beginning with "agreement" and "disagreement".

Definition [1]. **Complete agreement** is indicated by a matrix iff the distribution of ranks is such that each column comprises one and only one value of rank.

This corresponds to matrix [B] above, and also to matrix [D]. It might, however, be more useful to characterise [D] separately as a special case.

Definition [2]. **Complete disagreement** is indicated by a matrix iff the distribution of ranks is such that each column contains all and every possible rank assignment.

This corresponds to matrix [C] above. It might be noted that this definition is only appropriate to square matrices with the main diagonal included. Rectangular matrices, and those with the main

diagonal excluded need a different definition. The latter will not be considered here, because as noted earlier the thesis is mainly concerned with square matrices. The former will, however, be treated separately later on.

Definition [3]. Complete agreement without differentiation is indicated by a matrix iff all cells within the matrix contain the same value rank assignments.

This definition is intended to cover the situation illustrated by matrix [D]. Emphasis here should be placed on the fact that this definition refers to rank assignments only; a matrix of ratings which indicated agreement without differentiation need only have equal values within each row.

4. CRITERIA.

For convenience of interpretation an alternative statistic should yield a value of 0 for "no agreement" and 1 for "complete agreement". This will make it consistent with both Kendall's W and with correlation coefficients such as Spearman's Rho and Pearson's Product Moment.

Such a statistic will be considered useful if and only if it meets the following initial criteria:

Criterion [1]. It should return a value of 1 for those situations defined as complete agreement (i.e. definition [1] and matrix [B]).

This requirement is, in effect, a stipulation that if Kendall's W returns a value of 1, then so should the alternative statistic.

Criterion [2]. It should return a value of 1 for those situations defined as of complete agreement, but without differentiation (i.e. definition [3] and matrix [D]).

This requirement stipulates that in the special circumstances defined by definition [3], the alternative statistic will yield a value of 1, even though Kendall's W yields a value of 0.

Criterion [3]. It should return a value of 0 for situations defined as "no agreement" (i.e. definition [2] and matrix [C]).

Here, where Kendall's W returns a value of zero for situations defined by definition [2], then so should the alternative statistic.

By setting up the criteria in this way, it will be seen that a ready means of testing against an independent criterion is also set up. That is, the alternative statistic can be tested initially against Kendall's W. This, of course, would not be sufficient for a full development, but for present purposes, which are simply to construct a means by which the two situations defined by definitions [2] and [3] may be readily distinguished, then it should suffice.

Secondary criteria for an alternative statistic would have to include the stipulations that it returns equal values for comparable situations, and that the interpretation of any given value can be seen to have, at the very least, face validity in the light of raw data. These are extremely important, but unfortunately well beyond the scope of this thesis.

So, these are the definitions and criteria which an alternative measure to Kendall's W will have to meet. As noted earlier, the suggestion is that they can be met by making use of the standard deviations of the values appearing within the columns of a matrix. The discussion will now turn to consider this proposition. At this point the name "Sigma" will be introduced to refer to the alternative statistic. The reason for this name is quite simply because this statistic is based on standard deviations, and it seemed appropriate to acknowledge the fact in some way.

5. THE RATIONALE BEHIND SIGMA.

The rationale behind Sigma is even more straightforward than that behind Kendall's W. When a column contains all the same figures, then the standard deviation of those figures will be zero. Transferring this to the discussion above, it will be seen readily that in cases both where Kendall's W indicates agreement and in those where there is agreement but no differentiation, the columns contain uniform values. Hence, the standard deviations are zero in both cases. Taking this as a basis, then it should be possible to construct an alternative statistic which will indicate agreement in both situations. Here, of course, the value returned is zero, but it is a straightforward matter to turn it into 1 by simply taking the value returned and subtracting it from 1.

The evaluation of disagreement is less straightforward than that of agreement, because there is no obvious criterion by which to judge it. What is important here is that whatever value is derived it should equal 1, so that when subtracted from 1 it will yield a net value of 0. This would further suggest the necessity for the calculation of some value which, so to speak, automatically reflects a situation of disagreement. This value would then act as a divisor, so that when a set of empirically derived figures reflect the same situation, the net result is 1. It is therefore important to have some estimate of how high the standard deviation can get, that is its upper limits, and this, of course, will depend very much on particular cases. Fortunately at least one upper limit can be readily established with reference to the definitions given earlier.

The situation of complete disagreement was defined above (defintion [2]) as a state of affairs in which in and every possible rank assignement appeared in each column of the matrix. Thus for any given value of n, a value for the standard deviation can be calculated which will be constant for all matrices of that size. This value can be defined as the standard deviation of the series of values {1, 2, 3, ... n}.

Using this value as a divisor guarantees that whenever a situation of disagreement is observed within a set of figures, the result is 1, and when subtracted from 1, as for situations of agreement, the net result is therefore guaranteed to be 0. Thus two steps in the development of Sigma have been established. Now they need to be combined, and for this it is essential that the use of the divisor described above does not disrupt the result for the calculation of agreement. This will be examined later.

So far the calculations have been focussed at the level of individual columns, and not at a more general level taking into account the whole matrix. They need to be made more general. What this suggests is that some form of averaging needs to take place, but the question is what needs to be averaged, and what does one then do with the result?

One obvious suggestion would be to divide the standard deviations for each column by the value denoting disagreement, since this is a constant upper value, then take the mean value. This would then be subtracted from 1 to give an overall value. In effect this is testing the observed figures against a null hypothesis that there is no disagreement.

An alternative, which yields identical results, but is less involved, is to take the mean of the column standard deviations, then divide by the constant for disagreement, and finally subtract from 1.

In both of these cases what is happening is that the mean amount by which the pooled columns deviate from the independent criterion given by the constant value for disagreement is being evaluated. This would seem, prima facie, to be a reasonable strategy for developing the measure of concordance. Accordingly, the second alternative will be adopted, on the grounds of greater simplicity.

Thus, several steps have been described in the rationale behind Sigma, and simultaneously the possible steps in its calculation. These steps, will now be summarised, and some formalisation introduced. Following this an evaluation will be presented.

6. STEPS IN THE CALCULATION OF SIGMA.

For the purpose of the calculation of Sigma, a decision needs to be taken about which kind of standard deviation will be most appropriate. The decision taken here is that all values will be calculated on the basis of the sample standard deviation, not the more usual population standard deviation. The reason for this is very straightforward; the matrices for which the statistic is being constructed are here regarded as representing the whole of the appropriate population and not just a sample of it. Therefore an estimate for the population from which they are drawn is neither helpful nor relevant. The whole of what follows proceeds, therefore, on the basis of this assumption.

a) Calculation of the constant.

It has been suggested that for any matrix of size n, a constant value can be calculated which reflects a situation of disagreement. This constant was defined as the standard deviation of the set of values {1, 2, 3, ... n}. For convenience this value will be referred to as k, which is the conventional mathematical symbol for a constant. Thus, in formal terms the calculation of this constant can be given as

[4]
$$k = \sqrt{\frac{\sum_{1}^{n}\left(R_i - \left(\frac{1+2+ \ldots + n}{n}\right)\right)^2}{n}}$$

where:

R_i is any rank value in the series {1, 2, 3, ... n};

$\frac{1+2+ \ldots + n}{n}$ is the mean value of the series {1, 2, 3, ... n}.

A table of values for these constants is given at the end of this appendix.

b) Calculation of the column standard deviations.

Using the conventional formula, sample standard deviations are calculated for each column of the matrix.

c) Calculation of the mean standard deviation.

Using the conventional formula, the mean standard deviation for the matrix is calculated. For clarity this will be labelled S.

d) Calculation of Sigma.

To calculate Sigma, divide the result of step (c), the mean standard deviation, by the result of step (a), the constant k, and subtract the result from 1. This can be shown formally as:

[5]
$$\sigma = 1 - \frac{S}{k}$$

7. TRIALS AND COMPARISONS.

Having demonstrated the procedure for calculating Sigma, it is now essential to demonstrate that it gives the required results. To achieve this Sigma will be calculated for the three matrices [B],

[C], [D] given earlier. These, it will be recalled, represent situations of agreement, disagreement, and agreement without differentiation respectively.

The first step is to calculate the constant. This will be the same for all three matrices, since they are all size 5. Thus, from step (a) above (equation 4), the constant will take the value of the standard deviation of the series {1,2,3,4,5}, which is 1.4142. That is

$$k = 1.4142$$

a) Calculation of Sigma for agreement.

At this point the calculations are different for each matrix. In this case the calculations are being conducted on matrix [B], the one illustrating complete agreement. The next step in the calculation is to derive sample standard deviations for each of the columns. In the case of matrix [B] this produces the following vector:

{0,0,0,0,0}

From this vector a mean value is calculated in the usual manner, that is by adding the values and dividing by n. Obviously in this example the mean value is also 0. Thus:

$$S = 0$$

Finally, Sigma is calculated by dividing the value of S by the value of the constant k, and then subtracting from 1 (equation 5). In this case, therefore, the calculation is:

$$\sigma = 1 - \frac{0}{1.4142}$$

therefore: $\sigma = 1 - 0$

therefore: $\sigma = 1$

Therefore, in a situation defined as one of complete agreement, Sigma yields a value of 1, thus meeting criterion [1] above.

b) Calculation of Sigma for disagreement.

For this calculation matrix [C] will be used. The constant k remains at a value of 1.4142. Calculating the standard deviations of the columns yields the following vector: {1.4142; 1.4142; 1.4142; 1.4142; 1.4142}, therefore the mean standard deviation will also have the value 1.4142. Thus, the value of Sigma will be derived from the equation:

$$\sigma = 1 - \frac{1.4142}{1.4142}$$

therefore $\sigma = 1 - 1$

therefore $\sigma = 0$

Therefore in a situation defined as one of complete disagreement, Sigma yields a value of 0, thus meeting criterion [3].

c) Calculation of Sigma for non-differentiated agreement.

In this example matrix [D] is being used. Again the constant remains at a value of 1.4142. The column standard deviations yield a vector of {0,0,0,0,0}, thus giving a mean standard deviation of 0. Therefore Sigma is calculated by:

$$\sigma = 1 - \frac{0}{1.4142}$$

therefore $\sigma = 1 - 0$

therefore $\sigma = 1$

Therefore in a situation defined as one of complete agreement, but without differentiation, Sigma yields a value of 1, thus meeting criterion [2].

Thus, in terms of the three criteria set out earlier, Sigma delivers the right kind of results. Obviously what has been given above does not constitute a sufficient validation of Sigma, for that considerably more work needs to be undertaken. Nevertheless, that it meets the basic criteria is a factor in its favour.

8. MATRICES EXCLUDING THE MAIN DIAGONAL.

Unfortunately, while Sigma passes its trials in complete square matrices, it does not give such consistently good results in those where the main diagonal has been left out. It is unfortunate because the bulk of the analysis in the thesis is concerned with just such matrices.

Taking out the main diagonal of a matrix causes several problems in relation to the calculation of Sigma, as it does in general methodological terms. Nevertheless, for reasons given in chapter 9 above, it was considered necessary that self ratings be excluded from the general analyses, and this necessitates in turn the exclusion of the main diagonal from all of the interpersonal matrices.

Of immediate concern is the effect that leaving out the main diagonal has on matrices instantiating complete agreement in hierarchical differentiation. There is no effect on those illustrating disagreement or agreement with no differentiation. Sigma, as should be obvious from the discussion above, relies on the fact that in situations of agreement the columns contain constant values, and in situations of disagreement they contain the greatest variety of values possible. Thus leaving out the main diagonal does not greatly affect matrices showing non-differentiated agr-

eement and disagreement, but it does affect those showing agreement quite substantially. To see this consider the effect on matrix [B] when the main diagonal is removed:

[E]

Raters \ Ratees	1	2	3	4	5
1		1	2	3	4
2	1		2	3	4
3	1	2		3	4
4	1	2	3		4
5	1	2	3	4	
Total	4	7	10	13	16

It is obvious here that the column standard deviations are not going to be equal. Hence the basis for calculating Sigma and deriving a value of 1, as this example requires, is lost. It is also clear that the definition of complete agreement given earlier (definition [1]) is not appropriate in this case, and thus requires some modification:

Definition [4]. **Complete agreement** in matrices excluding the main diagonal, is indicated iff the relative rank ordering is in a constant direction within all rows of the matrix.

This, of course, is only a minor adjustment, since it does not solve the problem indicated above, that is, that when the main diagonal is excluded, Sigma does not meet criterion 1 given earlier.

In addition to this problem, excluding the main diagonal also requires some change in the equations. This is actually rather minor, and simply consists of substituting the term (n - 1) for the term (n) where it occurs, to take account of the fact that an n x n matrix without a main diagonal actually consists of n(n - 1) data points.

That there is obviously a problem here cannot be denied. That it is not obvious how it can be resolved is also undeniable. Nevertheless, there are reasons for not wishing to abandon Sigma at this point, in particular the fact that it can fairly successfully discriminate situations of agreement without differentiation and non agreement. To this extent it is still useful, and serves to provide slightly different information to that given by Kendall's W. This suggests that the two statistics could be used side by side.

So, the question is, what effect does leaving out the main diagonal have on Sigma? The answer is that it depresses the maximum value in situations of agreement in hierarchical evaluation. Taking matrix [E] as an example.

The constant in this example can be defined as the standard deviation of the series {1, 2, 3, ... n-1}, which in this case is equal to 1.118. Thus:

$$k = 1.118$$

The standard deviations of the columns yield the vector:

$$\{0;\ 0.433;\ 0.5;\ 0.433;\ 0\}$$

which in turn gives a value of S (the mean standard deviation) of:

$$S = 0.273$$

Taking these values and substituting them into equation [5] gives the following:

$$\sigma = 1 - \frac{0.273}{1.118}$$

therefore $$\sigma = 1 - 0.244$$

therefore $$\sigma = 0.756$$

Obviously this value is some way from 1. What is clear, however, is that this value will be a constant for matrices of size 5, because the situation illustrated by matrix [E] still constitutes a general illustration of agreement in matrices of this kind and size. Therefore, although a value of 1 is not attainable in these circumstances by Sigma at its present stage of development, nevertheless there is an upper value which remains constant. This of course will alter with the size of the matrix, but being a constant with respect to size means that the values can be tabulated. These are given at the end of the appendix.

9. SIGMA AND KENDALL'S W USED IN CONJUNCTION.

It is obvious that Sigma cannot stand alone as a measure of concordance. Indeed it was not really the intention to develop it as such, but to develop it as an adjunct to Kendall's W. The reason for this is quite simply that the time necessary for developing any statistic fully was not available, and Kendall's W, having been developed, tested and evaluated, and also having had its critical values tabulated, provides a well founded base of information that it would be rather foolish to try and do without.

So the intention was to try and use the two measures in tandem. Figure J.1. below gives an indication of how.

It will be seen that when used together, Kendall's W and Sigma can help to distinguish the main situations with which this appendix has been concerned. The blank cell in the diagram is probably unattainable; in no cases so far observed has Sigma taken on a low value when Kendall's W takes on a high value.

Figure J.1. Kendall's W and Sigma: Complementary aspects.

		Kendall's W	
		High	Low
Sigma	High	High agreement on differentiation.	High agreement on non-differentiation.
	Low		Low agreement.

10. DISCUSSION.

The main purpose of this appendix was to introduce a new statistical procedure, so that situations described above as high agreement with no differentiation could be readily distinguished from situations of no agreement. The procedure offered was called Sigma, in deference to its origin in the standard deviation.

It was shown that Sigma returned values of 0 when there was no agreement, and 1 when there was agreement both for hierarchical differentiation and for non- differentiation. This, however, was shown to be the case only for square matrices with the main diagonal included. Where the main diagonal was excluded, it was demonstrated that the upper values of Sigma, for situations of agreement on hierarchical structuring, were deflated. This was acknowledged as a problem, although no obvious solution presented itself. Nevertheless, if used in tandem with Kendall's W, rather than as a substitute, it was suggested that the desired distinctions could be readily, and effectively, discerned.

Quite clearly, however, if Sigma is to become a useful statistic in more than the limited way suggested here, then more research needs to be carried out. In particular some kind of correction needs to be worked out for excluded self ratings, and, a factor not yet mentioned, a set of critical values would need to be constructed. If nothing else the distribution of Sigma values should be established, and from this an estimate of probabilities. These, however, need the attention of a statistician.

For the present two tables of values are appended here. The first is a table of values of the constant k, for square matrices of size 4 to 10. The second is a table of upper values of Sigma, in situations of complete agreement on differentiation, for matrices size 4 to 10 with the main diagonal excluded.

Table J.1. Table of values for the constant k.
Square matrices size 4 to 10.

	With main diagonal						
	4	5	6	7	8	9	10
k	1.118	1.414	1.708	2.000	2.291	2.582	2.872
	Without main diagonal						
	4	5	6	7	8	9	10
k	0.816	1.118	1.414	1.708	2.000	2.291	2.582

Table J.2. Table of upper values of Sigma for the evaluation of agreement on differentiation.

Square matrices size 4 to 10.
Main diagonal excluded.

	Matrix size						
	4	5	6	7	8	9	10
σ	0.71	0.76	0.79	0.82	0.84	0.85	0.87

APPENDIX K: DOORMAT; A SUITE OF BASIC PROGRAMMES FOR INITIAL ANALYSES OF RAW DATA MATRICES DERIVED FROM SOCIOMETRIC QUESTIONNAIRES, SYMLOG, ASO AND SPI.

1. INTRODUCTION. 589

2. PROGRAMME "MENU" 591

3. PROGRAMME "MAT8" 591

4. PROGRAMME "SYMLOG" 609

1. INTRODUCTION.

In view of the enormous amount of data collected, and the necessity for conducting a considerable number of initial analyses it was considered important to try and automate as much of the process as possible. The reasons for this are obvious, but nevertheless may be summarised briefly in terms of the sheer amount of time that manual computation takes in this kind of work, and the fact that such computation is, even when conducted assiduously, liable to be error prone. With these in mind, a suite of programmes was written for the IBM PC (and later the Amstrad 1512), called DOORMAT (largely because it affords an entry into some aspects of the matrices which formed the bulk of the data).

In its present form DOORMAT consists of five programmes linked through an overarching "front end". Including the front end these programmes are loosely grouped into three areas. Area 1 consists of a programme called "MENU", and this acts as a link to all the other programmes; the listing of "Menu" follows this introduction.

Area 2 consists of four programmes, each with the filetype "MAT#". These are "Mat4", "Mat5", "Mat67" and "Mat8", and are designed to analyse matrices of the size indicated at the end of the name. Thus "Mat4" is designed specifically to analyse 4x4 matrices. It might be noted that a more elegant approach to the problem, one that would have allowed analysis of matrices of any size, only presented itself when the algorithm for automatic ranking was being constructed. By then it was too late to rewrite. Nevertheless, within the requirements of these programmes they do their job as it was intended.

Each of the "Mat#" programmes calculates, for a matrix of the specified size, totals means and standard deviations on both the columns and rows, as well as the Grand Total and Mean for the matrix. Two things should be noted, however. First, these calculations, and those which are described below, are conducted on a matrix with the main diagonal void (that is with self ratings excluded). The reasons for this are given in chapter 9 above. Second, the value for the standard deviation which is returned represents the population standard deviation rather than the sample standard deviation (that is the numerator used is n, not n-1). The reason for this is that for the purposes to which the analyses were to be put, the groups from which the data were gathered themselves constituted the population of interest, that is to say, they were not considered as a sample of some other population. In particular the standard deviations were used as guides to the amount of consensus within the group, and the extent to which individuals within the group differentiated the other group members. In the light of this, an estimate for a supragroup population seemed to be unintelligible and uninterpretable.

If requested via the sub-menus within the programme, all of the "Mat#" programmes will automatically assign rankings to values within the cells (row by row) and then return column means. They also calculate, for each cell of the matrix, deviations from the row means and then return column mean deviations. In addition two coefficients of concordance are calculated; Kendall's W (with

Taylor's modification - see Taylor, 1951), and Sigma (see appendix J above).

Finally, each of these programmes provide, if requested, summaries of the preceeding operations, with rankings automatically assigned. A sample of the output from these programmes is given in appendix L below.

The listing given below is that of "Mat8", the largest of these programmes. A complete listing of all the programmes is not necessary since "Mat8" displays all the essential structural features. Neither is a complete listing possible; in total DOORMAT comprises over 4,500 lines of code of which the "Mat#" programmes account for 3,267. If listed in toto this would require at least 110 pages - far too large for present purposes.

The third and last area into which the programmes are grouped is covered by the single programme "Symlog". In its present state this actually comprises of three integrated programmes, although four were originally projected. These consist of first what has been called "Intrapersonal SYMLOG" which calculates SYMLOG totals on ratings for "Self", "Wish", "LPC" and "MPC" (see appendix L below). In addition it returns values for graph distances between these points in both two and three dimensions, although it is worth noting that the two dimesional values are equivalent to values of Cronbach's D calculated on raw SYMLOG data.

The second programme calculates values of ASO from ratings of LPC and MPC. It returns values of ASO for Task activity, Social activity and overall ASO, labelling the values as High, Medium or Low, thus allowing for ready scanning of the data. Additionally, because the LPC/MPC scales used in the Warwick Q were different to those used in the SGQ (see appendices F and G above), there is also a conversion of Warwick Q scores to the 7-point convention used in SGQ.

Finally the programme SPI takes data entered direct from Belbin's questionnaire and calculates column totals. It has the additional feature of allowing re-entry of incorrect data (as do all the programmes discussed here) without having to enter all of the data points again, and of disallowing data entry where the row totals do not add up to the required 10.

The fourth programme was to be labelled "Interpersonal SYMLOG", which speaks for itself. Time, however, simply ran out.

The full listing for programme "SYMLOG" is given at the end of this appendix.

It should be noted that the various algorithms are clearly labelled throughout the listings, and should, therefore, be relatively easy to identify. That for automatic ranking was originally given to me, in BBC Basic, by Dr. I. E. Morley of the **University of Warwick**, and I gratefully acknowledge the fact here that without it these programmes would have been of considerably less use than they have turned out to be.


```
1 '=================================================
2 'PROGRAM MENU
3 '=================================================
5 KEY OFF
10 COLOR 8,7,3
15 CLS
20 LOCATE 4,33:PRINT"MAIN MENU"
25 LOCATE 5,33:PRINT"---------"
30 LOCATE 7,25:PRINT"[1] INPUT A MATRIX"
35 LOCATE 9,25:PRINT"[2] INTERPERSONAL SYMLOG"
40 LOCATE 11,25:PRINT"[3] INTRAPERSONAL SYMLOG"
45 LOCATE 13,25:PRINT"[4] ASO (LPC/MPC)"
50 LOCATE 15,25:PRINT"[5] BELBIN'S SPI"
55 LOCATE 17,25:PRINT"[6] EXIT TO SYSTEM"
60 LOCATE 20,25:INPUT"ENTER YOUR CHOICE HERE -->",CHOICE$
65 IF CHOICE$ = "1" GOTO 100
70 IF CHOICE$ = "2" GOTO 130
75 IF CHOICE$ = "3" THEN RUN "SYMLOG"
80 IF CHOICE$ = "4" THEN RUN "SYMLOG"
85 IF CHOICE$ = "5" THEN RUN "SYMLOG"
90 IF CHOICE$ = "6" GOTO 140
95 BEEP: GOTO 55
100 CLS:  LOCATE 11,18:INPUT"O.K.  BUSTER, HOW MANY GROUP MEMBERS?
      (4-8) ",N%
105 IF N%=4 THEN RUN "MAT4"
110 IF N%=5 THEN RUN "MAT5"
115 IF N%=6 THEN RUN "MAT67"
120 IF N%=7 THEN RUN "MAT67"
125 IF N%=8 THEN RUN "MAT8"
130 COLOR 14,1,3: CLS: FOR DO = 1 TO 35
135 LOCATE 11,25:PRINT"SORRY NO SOFTWARE YET": NEXT DO
140 COLOR 13,5,12: CLS: FOR DO = 1 TO 35
145 LOCATE 11,25:PRINT"BYEEEEEEEEEEEE!": NEXT DO
150 IF CHOICE$="6" THEN SYSTEM
155 END
```

```
1 '=================================================
2 'PROGRAM MAT8
3 '=================================================
5 KEY OFF
10 COLOR 14,1,3
15 CLS:LOCATE 11,4:INPUT"Is this a continuation of data input from
      the same group? (Y/N) ",PORT$
20 DEF FNS(X)=SQR(X)
25 DEF FNM(X)=X/(N%-1)
30 DEF FNR(X)=INT(X*100!+.5)/100!
35 OPTION BASE 1
40 GOTO 115
45 RESTORE
50 PORT$="0"
55 ERASE RDATA
60 ERASE RANK
65 ERASE RSUM
70 ERASE SRANK
75 ERASE TIE%
80 ERASE TDATA
85 ERASE TRANK
```

```
90 ERASE TTIE
95 ERASE MRANK
100 GATE%=0
105 COLOR 14,1,3
110 REM-------------------------------------------------
115 REM MAIN MENU MATRIX ANALYSIS
120 REM-------------------------------------------------
125 CLS: X$="0": X%=0
130 LOCATE 4,21:PRINT"ANALYSIS OF DATA FROM AN 8-PERSON GROUP"
135 LOCATE 5,21:PRINT"---------------------------------
    ------"
140 LOCATE 7,22:PRINT"[1] INPUT A MATRIX OR START A SERIES"
145 LOCATE 9,22:PRINT"[2] COMPLETE A SERIES OF MATRICES"
150 LOCATE 11,22:PRINT"[3] RETURN TO MAIN MENU"
155 LOCATE 13,22:PRINT"[4] EXIT TO SYSTEM"
160 LOCATE 20,22:INPUT"ENTER YOUR CHOICE HERE -->",CHOICE$
165 IF CHOICE$ = "3" THEN RUN "MENU"
170 IF CHOICE$ = "4" THEN COLOR 13,5,12: CLS
175 IF CHOICE$ = "4" THEN LOCATE 11,25:PRINT "BYEEEEEEEEEEE!":
    SYSTEM
180 IF PORT$="Y" GOTO 215
185 CLS:LOCATE 11,25:INPUT"Warwick Q (1) or SGQ (2)?  ",DOOR$
190 IF DOOR$="1" THEN LOCATE 14,25:PRINT"You have selected Warwick
    Q.":GOTO 205
195 IF DOOR$="2" THEN LOCATE 14,25:PRINT"You have selected
    SGQ.":GOTO 205
200 BEEP: GOTO 185
205 LOCATE 16,25:INPUT"IS THIS CORRECT? (Y/N) ",K$
210 IF K$="N" GOTO 185
215 IF CHOICE$ = "1" GOTO 245
220 IF CHOICE$ = "2" GOTO 230
225 BEEP: GOTO 160
230 CLS: LOCATE 11,25: INPUT"START WITH WHICH QUESTION? ",X$
235 LOCATE 13,25:INPUT"ARE YOU SURE? (Y/N) ",K$
240 IF K$="N" GOTO 230
245 CLS:LOCATE 11,20:INPUT"Do you want to save data on disc? (Y/N)
    ",K$
250 IF K$="N" GOTO 575
255 GATE%=1
260 CLS:LOCATE 11,25:PRINT"PUT DATA DISC IN DRIVE: B"
265 LOCATE 13,25:INPUT"Strike RETURN when ready.",K$
270 CLS:LOCATE 4,15:PRINT"To save data you need to enter a unique
    filename"
275 LOCATE 5,15:PRINT"consisting of up to 14 characters."
280 LOCATE 14,15:PRINT"The files you already have stored are
    listed below:"        FILES "B:"
285 LOCATE 6,15:INPUT"ENTER FILENAME HERE: ",INFILE$
290 INFILE$="B:"+INFILE$
295 CLOSE #1:OPEN INFILE$ FOR APPEND AS #1 LEN=256
300 GOTO 575
305 REM-------------------------------------------------
310 REM SUB MENU
315 REM-------------------------------------------------
320 COLOR 14,1,3: LOCATE 1,71:INPUT "",CHOICE$: CLS
325 LOCATE 1,25:PRINT"SUB-MENU: ANALYSING 8 x 8 MATRIX"
330 LOCATE 2,20:PRINT"---------------------------------
    ----------"
335 LOCATE 3,20:PRINT"[1]  DEVIATIONS FROM ROW MEANS"
```



```
340 LOCATE 4,20:PRINT"[2]  MEAN RANKS"
345 LOCATE 5,20:PRINT"[3]  SUMMARIES"
350 LOCATE 6,20:PRINT"---------------------------------
    ----------"
355 LOCATE 7,20:PRINT"[4]  DISPLAY LAST RAW DATA MATRIX"
360 LOCATE 8,20:PRINT"[5]  DISPLAY LAST SET OF RANKS"
365 LOCATE 9,20:PRINT"[6]  DISPLAY LAST SET OF SUMMARIES"
370 LOCATE 10,20:PRINT"-----------------------
    ----------"
375 LOCATE 11,20:PRINT"[7]  RE-ENTER LAST RAW DATA MATRIX"
380 LOCATE 12,20:PRINT"[8]  ENTER NEW MATRIX IN THE SERIES"
385 LOCATE 13,20:PRINT"[9]  ENTER DATA FOR ANOTHER 8-PERSON GROUP"
390 LOCATE 14,20:PRINT"---------------------------------
    ----------"
395 LOCATE 15,20:PRINT"[10] GO BACK TO MAIN MENU"
400 LOCATE 22,20:PRINT"ENTER YOUR CHOICE HERE -->"
405 LOCATE 22,48:INPUT "",CHOICE$
410 IF CHOICE$ = "1" GOTO 2635   'Deviations from row mean
415 IF CHOICE$ = "2" GOTO 2930   'Ranks
420 IF CHOICE$ = "3" GOTO 3655   'Summaries
425 IF CHOICE$ = "4" GOTO 2340   'Display last raw data
430 IF CHOICE$ = "5" GOTO 3210   'Display last ranks
435 IF CHOICE$ = "6" GOTO 3860   'Display last summaries
440 IF CHOICE$ = "7" GOTO 470    'Re-enter raw data
445 IF CHOICE$ = "8" GOTO 4390   'Enter new matrix
450 IF CHOICE$ = "9" GOTO 45     'Enter data for new group
455 IF CHOICE$ = "10" THEN RUN "MENU"
460 BEEP:GOTO 400
465 REM-------------------------------------------------
470 CLS:LOCATE 11,25:PRINT"ARE YOU ABSOLUTELY SURE THAT"
475 LOCATE 12,25:INPUT"YOU WANT TO DO THIS THING? (Y/N) ",K$
480 IF K$="N" THEN CLS: GOTO 325
485 CLS:GOTO 1405
490 REM-------------------------------------------------
495 REM PRINT SUMMARY MATRIX (No data); All sizes, 4 to 8
500 REM-------------------------------------------------
505 GOTO 565
510 CLS
515 GOSUB 895
520 LOCATE 1,1:PRINT QU$ " SUMMARIES (Means)
525 LOCATE 3,1: PRINT "_____________________________________
    _____"
530 LOCATE 5,1: PRINT "RATINGS": LOCATE 7,1: PRINT "(Ranks)"
535 LOCATE 8,1: PRINT "_____________________________________
    _____"
540 LOCATE 10,1: PRINT "DEVIATIONS": LOCATE 12,1: PRINT "(Ranks)"
545 LOCATE 13,1: PRINT "_____________________________________
    _____"
550 LOCATE 15,1: PRINT "RANKS": LOCATE 17,1: PRINT "(Ranks)"
555 LOCATE 18,1: PRINT "_____________________________________
    _____"
560 RETURN
565 GOSUB 510
570 REM-------------------------------------------------
575 REM ***MATRIX DETAILS INPUT***
580 REM-------------------------------------------------
585 IF PORT$="Y" THEN OPEN "DETAIL" FOR INPUT AS #2
590 IF PORT$="Y" THEN INPUT #2,SC$,GN$,SN$,SD$,N%,DOOR$,GATE%:
```

```
      CLOSE #2
595 IF PORT$="Y" GOTO 975
600 CLS
605 N%=8
610 LOCATE 4,25:PRINT"(1) WHAT IS THE SERIES CODE? _____"
615 LOCATE 4,59:INPUT"",SC$
620 LOCATE 6,25:PRINT"(2) WHAT IS THE GROUP NUMBER? ____"
625 LOCATE 6,59:INPUT"",GN$
630 LOCATE 8,25:PRINT"(3) WHAT IS THE SESSION NUMBER? __"
635 LOCATE 8,59:INPUT"",SN$
640 LOCATE 10,25:PRINT"(4) WHAT IS THE SESSION DATE? ____"
645 LOCATE 10,59:INPUT"",SD$
650 LOCATE 12,25:PRINT"(5) NUMBER OF GROUP MEMBERS ______";N%
655 LOCATE 16,25:PRINT"ARE THESE DETAILS CORRECT? TYPE Y or N"
660 LOCATE 16,64:INPUT"",D$
665 IF D$="Y" GOTO 955
670 IF D$="N" GOTO 700
675 BEEP: LOCATE 18,25:PRINT"PLEASE TYPE Y or N"      "
680 GOTO 660
685 REM-----------------------------------------------
690 REM DETAIL AMENDMENT ROUTINE
695 REM-----------------------------------------------
700 LOCATE 18,25:PRINT"WHAT DO YOU WANT TO ALTER?      "
705 LOCATE 20,25:PRINT"PLEASE TYPE: All, 1, 2, 3, or 4"
710 LOCATE 20,60:INPUT"",A$
715 IF A$="ALL" GOTO 600
720 IF A$="1" THEN GOSUB 780
725 IF A$="2" THEN GOSUB 805
730 IF A$="3" THEN GOSUB 830
735 IF A$="4" THEN GOSUB 855
740 LOCATE 18,25:PRINT"DO YOU WANT TO ALTER ANYTHING ELSE? Y or N"
745 LOCATE 20,25:PRINT"                                      "
750 LOCATE 18,68:INPUT"",B$
755 IF B$="Y" GOTO 700
760 IF B$="N" GOTO 955
765 BEEP: LOCATE 20,25:PRINT"PLEASE TYPE Y or N       "
770 GOTO 750
775 REM-----------------------------------------------
780 REM SUBROUTINE: ALTER SERIES CODE
785 REM-----------------------------------------------
790 LOCATE 4,59:INPUT"",SC$
795 RETURN
800 REM-----------------------------------------------
805 REM SUBROUTINE: ALTER GROUP NUMBER
810 REM-----------------------------------------------
815 LOCATE 6,59:INPUT"",GN$
820 RETURN
825 REM-----------------------------------------------
830 REM SUBROUTINE: ALTER SESSION NUMBER
835 REM-----------------------------------------------
840 LOCATE 8,59:INPUT"",SN$
845 RETURN
850 REM-----------------------------------------------
855 REM SUBROUTINE: ALTER SESSION DATE
860 REM-----------------------------------------------
865 LOCATE 10,59:INPUT"",SD$
870 RETURN
```



```
875 REM-----------------------------------------------
880 rem SUBROUTINE: PRINT GROUP DETAILS
885 REM-----------------------------------------------
890 GOTO 945
895 CLS
900 LOCATE 1,1:PRINT"SERIES: ";SC$;". *GROUP No.: ";GN$;".
    *SESSION No.: ";SN$;"."
905 LOCATE 3,1:PRINT"DATE OF SESSION: ";SD$;". *No. OF MEMBERS:
    ";N%;"."
910 LOCATE 4,1:PRINT"_____
    _____"
915 INPUT"",K$: CLS
920 IF K$<>"P" GOTO 940
921 LPRINT CHR$(27) + "<"
925 LPRINT"SERIES: ";SC$;". *GROUP No.: ";GN$;". *SESSION No.:
    ";SN$;"."
930 LPRINT"DATE OF SESSION: ";SD$;". *No. OF MEMBERS: ";N%;"."
935 LPRINT"_____
    _____"
940 RETURN
945 GOSUB 895
950 REM-----------------------------------------------
955 REM QUESTION TITLES & BREAK-IN LOOP
960 REM-----------------------------------------------
965 CLOSE #2: OPEN "DETAIL" FOR OUTPUT AS #2
970 WRITE #2,SC$,GN$,SN$,SD$,N%,DOOR$,GATE%:CLOSE #2
975 TI%=INT((N%-1)/2)
980 DIM RDATA(N%,N%)
985 DIM RANK(N%,N%)
990 DIM RSUM(3,N%)
995 DIM SRANK(3,N%)
1000 DIM TIE%(N%,TI%)
1005 DIM TDATA(N%,N%)
1010 DIM TRANK(1,N%)
1015 DIM TTIE(N%,1)
1020 DIM MRANK(N%+2,N%)
1025 REM-----------------------------------------------
1030 DATA "Qu.1: TALKING"
1035 DATA "Qu.2: QUALITY OF IDEAS"
1040 DATA "Qu.3: QUANTITY OF IDEAS"
1045 DATA "Qu.4a: GUIDANCE ATTEMPTS"
1050 DATA "Qu.4b: QUALITY OF GUIDANCE"
1055 DATA "Qu.5: LIKING"
1060 DATA "Qu.6: CLARIFICATION"
1065 DATA "Qu.7: POTENTIAL HELP"
1070 DATA "Qu.8: DISLIKING"
1075 DATA "Qu.9a: HURT FEELINGS (Filtered)"
1080 DATA "Qu.9b: ATTEMPTS TO SOOTHE HURT FEELINGS"
1085 DATA "Qu.9c: EFFECTIVENESS OF ATTEMPTS TO SOOTHE HURT
     FEELINGS"
1090 DATA "Qu.10: ATTEMPTED DOMINATION"
1095 DATA "Qu.11: JOKING (Filtered)"
1100 DATA "Qu.12: LESS THAN DESIRED CONTRIBUTION"
1105 DATA "Qu.13: EXPECTATIONS (Wished for)"
1110 DATA "Qu.14: EXPECTATIONS (Predictions)"
1115 DATA "Qu.15: OVERTALKING"
1120 DATA "Qu.16: WITHDRAWAL"
1125 DATA "Qu.17a: ATTEMPTED INFLUENCE"
```

```
1130 DATA "Qu.17b: SUCCESSFUL INFLUENCE"
1135 DATA "Qu.18a: HOSTILITY (Filtered)"
1140 DATA "Qu.18b: ATTEMPTS TO CALM HOSTILITY"
1145 DATA "Qu.18c: EFFECTIVENESS OF ATTEMPTS TO CALM HOSTILITY"
1150 DATA "Qu.19: FUTURE COLLEAGUES"
1155 DATA "Qu.20a: ATTEMPTED CORDIALITY"
1160 DATA "Qu.20b: SUCCESSFUL CORDIALITY"
1165 DATA "Qu.1: IDEAS"
1170 DATA "Qu.2: GUIDANCE"
1175 DATA "Qu.3: LIKING"
1180 DATA "Qu.4: FUNCTIONS AS LEADER"
1185 DATA "Qu.5: COLLEAGUES"
1190 DATA "Qu.6: STANDS OUT AS LEADER"
1195 IF DOOR$="1" THEN FOR DO=1 TO 27: READ QU$: NEXT DO
1200 IF X$="1", THEN GOTO 1390
1205 IF DOOR$="1" GOTO 1370
1210 IF X$="2",THEN X%=2
1215 IF X$="3",THEN X%=3
1220 IF X$="4",THEN X%=4
1225 IF X$="4A",THEN X%=4
1230 IF X$="4B",THEN X%=5
1235 IF X$="5",THEN X%=6
1240 IF X$="6",THEN X%=7
1245 IF X$="7",THEN X%=8
1250 IF X$="8",THEN X%=9
1255 IF X$="9",THEN X%=10
1260 IF X$="9A",THEN X%=10
1265 IF X$="9B",THEN X%=11
1270 IF X$="9C",THEN X%=12
1275 IF X$="10",THEN X%=13
1280 IF X$="11",THEN X%=14
1285 IF X$="12",THEN X%=15
1290 IF X$="13",THEN X%=16
1295 IF X$="14",THEN X%=17
1300 IF X$="15",THEN X%=18
1305 IF X$="16",THEN X%=19
1310 IF X$="17",THEN X%=20
1315 IF X$="17A",THEN X%=20
1320 IF X$="17B",THEN X%=21
1325 IF X$="18",THEN X%=22
1330 IF X$="18A",THEN X%=22
1335 IF X$="18B",THEN X%=23
1340 IF X$="18C",THEN X%=24
1345 IF X$="19",THEN X%=25
1350 IF X$="20",THEN X%=26
1355 IF X$="20A",THEN X%=26
1360 IF X$="20B",THEN X%=27
1365 IF DOOR$="2" GOTO 1375
1370 LET X%=VAL(X$)
1375 FOR DO = 1 TO X%-1: READ QU$: NEXT DO
1380 IF DOOR$="1" THEN Y%=6
1385 IF DOOR$="2" THEN Y%=27
1390 FOR QU = X% TO Y%
1395 READ QU$
1400 GOSUB 895
1405 LOCATE 1,1:PRINT QU$
```



```
1410 REM-----------------------------------------------
1415 REM SUBROUTINE: PRINT AN 8 X 8 MATRIX
1420 REM-----------------------------------------------
1425 GOTO 1500
1430 LOCATE 3,1:PRINT"S    1     2     3     4     5     6"
1435 LOCATE 4,1:PRINT"-------------------------------------
     ---------"
1440 LOCATE 3,42:PRINT"7     8"
1445 LOCATE 4,37:PRINT"---------------"
1450 LOCATE 5,1:PRINT"1"
1455 LOCATE 6,1:PRINT"2"
1460 LOCATE 7,1:PRINT"3"
1465 LOCATE 8,1:PRINT"4"
1470 LOCATE 9,1:PRINT"5"
1475 LOCATE 10,1:PRINT"6"
1480 LOCATE 11,1:PRINT"7"
1485 LOCATE 12,1:PRINT"8"
1490 LOCATE 13,1:PRINT"-------------------------------------
     -------------------"
1495 RETURN
1500 GOSUB 1430
1505 REM-----------------------------------------------
1510 REM SUBROUTINE: PRINT 'T,X,SD'
1515 REM-----------------------------------------------
1520 GOTO 1560
1525 LOCATE 14,1:PRINT"T": LOCATE 16,1:PRINT"X": LOCATE
18,1:PRINT"SD"
1530 LOCATE 13,1:PRINT"-------------------------------------
     ------------------- --------------------"
1535 LOCATE 19,1:PRINT"-------------------------------------
     -----------------------------------------"
1540 LOCATE 3,42:PRINT"7     8       T     X     SD"
1545 LOCATE 4,37:PRINT"--------------- ---------- ---------- -----"
1550 LOCATE 19,1:PRINT"-------------------------------------
     -----------------------------------------------"
1555 RETURN
1560 GOSUB 1525
1565 GOTO 1615
1570 REM-----------------------------------------------
1575 SUBROUTINE: PRINT 'X'
1580 REM-----------------------------------------------
1585 GOTO 1605
1590 LOCATE 14,1:PRINT"X"
1595 LOCATE 15,1:PRINT"-------------------------------------
     -----------------------------------------------"
1600 RETURN
1605 GOSUB 1590
1610 REM-----------------------------------------------
1615 REM ENTER AN 8 X 8 RAW DATA MATRIX
1620 REM-----------------------------------------------
1625 LOCATE 5,6:INPUT"",A: LOCATE 5,12:INPUT"",B: LOCATE
     5,18:INPUT"",C
1630 LOCATE 5,24:INPUT"",D: LOCATE 5,30:INPUT"",E: LOCATE
     5,36:INPUT"",F
1635 LOCATE 5,42:INPUT"",AB
1640 LOCATE 5,48:INPUT"",AC
1645 LOCATE 6,6:INPUT"",G: LOCATE 6,12:INPUT"",H: LOCATE
     6,18:INPUT"",I
```

```
1650 LOCATE 6,24:INPUT"",J: LOCATE 6,30:INPUT"",K: LOCATE
     6,36:INPUT"";L
1655 LOCATE 6,42:INPUT"",AD
1660 LOCATE 6,48:INPUT"",AE
1665 LOCATE 7,6:INPUT"",M: LOCATE 7,12:INPUT"",N: LOCATE
     7,18:INPUT"",O
1670 LOCATE 7,24:INPUT"",P: LOCATE 7,30:INPUT"",Q: LOCATE
     7,36:INPUT"",R
1675 LOCATE 7,42:INPUT"",AF
1680 LOCATE 7,48:INPUT"",AG
1685 LOCATE 8,6:INPUT"",S: LOCATE 8,12:INPUT"",T: LOCATE
     8,18:INPUT"",U
1690 LOCATE 8,24:INPUT"",V: LOCATE 8,30:INPUT"",W: LOCATE
     8,36:INPUT"",X
1695 LOCATE 8,42:INPUT"",AH
1700 LOCATE 8,48:INPUT"",AI
1705 LOCATE 9,6:INPUT"",Y: LOCATE 9,12:INPUT"",Z: LOCATE
     9,18:INPUT"",AA
1710 LOCATE 9,24:INPUT"",BB: LOCATE 9,30:INPUT"",CC: LOCATE
     9,36:INPUT"",DD
1715 LOCATE 9,42:INPUT"",AJ
1720 LOCATE 9,48:INPUT"",AK
1725 LOCATE 10,6:INPUT"",EE: LOCATE 10,12:INPUT"",FF: LOCATE
     10,18:INPUT"",GG
1730 LOCATE 10,24:INPUT"",HH: LOCATE 10,30:INPUT"",II: LOCATE
     10,36:INPUT"",JJ
1735 LOCATE 10,42:INPUT"",AL
1740 LOCATE 10,48:INPUT"",AM
1745 LOCATE 11,6:INPUT"",KK: LOCATE 11,12:INPUT"",LL: LOCATE
     11,18:INPUT"",MM
1750 LOCATE 11,24:INPUT"",NN: LOCATE 11,30:INPUT"",OO: LOCATE
     11,36:INPUT"",PP
1755 LOCATE 11,42:INPUT"",AN
1760 LOCATE 11,48:INPUT"",AO
1765 LOCATE 12,6:INPUT"",QQ: LOCATE 12,12:INPUT"",RR: LOCATE
     12,18:INPUT"",SS
1770 LOCATE 12,24:INPUT"",TT: LOCATE 12,30:INPUT"",UU: LOCATE
     12,36:INPUT"",VV
1775 LOCATE 12,42:INPUT"",AP: LOCATE 12,48:INPUT"",AQ
1780 REM-----------------------------------------------
1785 LET T1=(B+C+D+E+F+AB+AC): LET T2=(G+I+J+K+L+AD+AE): LET
     T3=(M+N+P+Q+R+AF+AG)
1790 LET T4=(S+T+U+W+X+AH+AI): LET T5=(Y+Z+AA+BB+DD+AJ+
     AK): LET T6=(EE+FF+GG+HH+II+AL+AM)
1795 LET T7=(KK+LL+MM+NN+OO+PP+AO)
1800 LET T8=(QQ+RR+SS+TT+UU+VV+AP)
1805 REM-----------------------------------------------
1810 LET X1=T1/7: LET X2=T2/7: LET X3=T3/7: LET X4=T4/7: LET
     X5=T5/7
1815 LET X6=T6/7: LET X7=T7/7: LET X8=T8/7
1820 REM-----------------------------------------------
1825 LET RD12=(B-X1): LET RD13=(C-X1): LET RD14=(D-X1): LET
     RD15=(E-X1)
1830 LET D12=(B-X1)^2: LET D13=(C-X1)^2: LET D14=(D-X1)^2: LET
     D15=(E-X1)^2
1835 LET RD16=(F-X1)
1840 LET D16=(F-X1)^2
1845 LET RD17=(AB-X1): LET D17=(AB-X1)^2
```



```
1850 LET RD18=(AC-X1): LET D18=(AC-X1)^2
1855 LET RD21=(G-X2): LET RD23=(I-X2): LET RD24=(J-X2): LET
     RD25=(K-X2)
1860 LET D21=(G-X2)^2: LET D23=(I-X2)^2: LET D24=(J-X2)^2: LET
     D25=(K-X2)^2
1865 LET RD26=(L-X2): LET D26=(L-X2)^2
1870 LET RD27=(AD-X2): LET D27=(AD-X2)^2
1875 LET RD28=(AE-X2): LET D28=(AE-X2)^2
1880 LET RD31=(M-X3): LET RD32=(N-X3): LET RD34=(P-X3): LET
     RD35=(Q-X3)
1885 LET D31=(M-X3)^2: LET D32=(N-X3)^2: LET D34=(P-X3)^2: LET
     D35=(Q-X3)^2
1890 LET RD36=(R-X3): LET D36=(R-X3)^2
1895 LET RD37=(AF-X3): LET D37=(AF-X3)^2
1900 LET RD38=(AG-X3): LET D38=(AG-X3)^2
1905 LET RD41=(S-X4): LET RD42=(T-X4): LET RD43=(U-X4): LET
     RD45=(W-X4)
1910 LET D41=(S-X4)^2: LET D42=(T-X4)^2: LET D43=(U-X4)^2: LET
     D45=(W-X4)^2
1915 LET RD46=(X-X4): LET D46=(X-X4)^2
1920 LET RD47=(AH-X4): LET D47=(AH-X4)^2
1925 LET RD48=(AI-X4): LET D48=(AI-X4)^2
1930 LET RD51=(Y-X5): LET RD52=(Z-X5): LET RD53=(AA-X5): LET
     RD54=(BB-X5)
1935 LET D51=(Y-X5)^2: LET D52=(Z-X5)^2: LET D53=(AA-X5)^2: LET
     D54=(BB-X5)^2
1940 LET RD56=(DD-X5): LET D56=(DD-X5)^2
1945 LET RD57=(AJ-X5): LET D57=(AJ-X5)^2
1950 LET RD58=(AK-X5): LET D58=(AK-X5)^2
1955 LET RD61=(EE-X6): LET RD62=(FF-X6): LET RD63=(GG-X6): LET
     RD64=(HH-X6)
1960 LET D61=(EE-X6)^2: LET D62=(FF-X6)^2: LET D63=(GG-X6)^2: LET
     D64=(HH-X6)^2
1965 LET RD65=(II-X6): LET D65=(II-X6)^2
1970 LET RD67=(AL-X6): LET D67=(AL-X6)^2
1975 LET RD68=(AM-X6): LET D68=(AM-X6)^2
1980 LET RD71=(KK-X7): LET RD72=(LL-X7): LET RD73=(MM-X7): LET
     RD74=(NN-X7)
1985 LET D71=(KK-X7)^2: LET D72=(LL-X7)^2: LET D73=(MM-X7)^2: LET
     D74=(NN-X7)^2
1990 LET RD75=(OO-X7): LET RD76=(PP-X7): LET D75=(OO-X7)^2: LET
     D76=(PP-X7)^2
1995 LET RD78=(AO-X7): LET D78=(AO-X7)^2
2000 LET RD81=(QQ-X8): LET RD82=(RR-X8): LET RD83=(SS-X8): LET
     RD84=(TT-X8)
2005 LET D81=(QQ-X8)^2: LET D82=(RR-X8)^2: LET D83=(SS-X8)^2: LET
     D84=(TT-X8)^2
2010 LET RD85=(UU-X8): LET RD86=(VV-X8): LET RD87=(AP-X8)
2015 LET D85=(UU-X8)^2: LET D86=(VV-X8)^2: LET D87=(AP-X8)^2
2020 REM-----------------------------------------------
2025 LET D1=SQR((D12+D13+D14+D15+D16+D17+D18)/7)
2030 LET D2=SQR((D21+D23+D24+D25+D26+D27+D28)/7)
2035 LET D3=SQR((D31+D32+D34+D35+D36+D37+D38)/7)
2040 LET D4=SQR((D41+D42+D43+D45+D46+D47+D48)/7)
2045 LET D5=SQR((D51+D52+D53+D54+D56+D57+D58)/7)
2050 LET D6=SQR((D61+D62+D63+D64+D65+D67+D68)/7)
2055 LET D7=SQR((D71+D72+D73+D74+D75+D76+D78)/7)
2060 LET D8=SQR((D81+D82+D83+D84+D85+D86+D87)/7)
```

```
2065 REM-------------------------------------------------
2070 LET GTOTAL=(B+C+D+E+F+G+I+J+K+L+M+N+P+Q+R+S+T+U+W+
     X+Y+Z+AA+B B+DD+EE+FF+GG+HH+II)
2075 LET GTOTAL=(GTOTAL+AB+AD+AF+AH+AJ+AL+KK+LL+MM+NN+OO+PP)
2080 LET GTOTAL=(GTOTAL+AC+AE+AG+AI+AK+AM+AO+QQ+RR+SS+TT+UU+VV+AP)
2085 IF N%=8, THEN LET GMEAN=GTOTAL/56
2090 REM-------------------------------------------------
2095 LET T9=(G+M+S+Y+EE+KK+QQ): LET T10=(B+N+T+Z+FF+LL+RR): LET
     T11=(C+I+U+AA+GG+MM+SS)
2100 LET T12=(D+J+P+BB+HH+NN+TT): LET T13=(E+K+Q+W+II+OO+UU): LET
     T14=(F+L+R+X+DD+PP+VV)
2105 LET T15=(AB+AD+AF+AH+AJ+AL+AP)
2110 LET T16=(AC+AE+AG+AI+AK+AM+AO)
2115 REM-------------------------------------------------
2120 LET X9=T9/7: LET X10=T10/7: LET X11=T11/7: LET X12=T12/7
2125 LET X13=T13/7: LET X14=T14/7: LET X15=T15/7: LET X16=T16/7
2130 REM-------------------------------------------------
2135 LET D112=(G-X9)^2: LET D113=(M-X9)^2: LET D114=(S-X9)^2: LET
     D115=(Y-X9)^2
2140 LET D116=(EE-X9)^2
2145 LET D117=(KK-X9)^2
2150 LET D118=(QQ-X9)^2
2155 LET D221=(B-X10)^2: LET D223=(N-X10)^2: LET D224=(T-X10)^2
2160 LET D225=(Z-X10)^2: LET D226=(FF-X10)^2
2165 LET D227=(LL-X10)^2
2170 LET D228=(RR-X10)^2
2175 LET D331=(C-X11)^2: LET D332=(I-X11)^2: LET D334=(U-X11)^2
2180 LET D335=(AA-X11)^2: LET D336=(GG-X11)^2
2185 LET D337=(MM-X11)^2
2190 LET D338=(SS-X11)^2
2195 LET D441=(D-X12)^2: LET D442=(J-X12)^2: LET D443=(P-X12)^2
2200 LET D445=(BB-X12)^2: LET D446=(HH-X12)^2
2205 LET D447=(NN-X12)^2
2210 LET D448=(TT-X12)^2
2215 LET D551=(E-X13)^2: LET D552=(K-X13)^2: LET D553=(Q-X13)^2
2220 LET D554=(W-X13)^2: LET D556=(II-X13)^2
2225 LET D557=(OO-X13)^2
2230 LET D558=(UU-X13)^2
2235 LET D661=(F-X14)^2: LET D662=(L-X14)^2: LET D663=(R-X14)^2
2240 LET D664=(X-X14)^2: LET D665=(DD-X14)^2
2245 LET D667=(PP-X14)^2
2250 LET D668=(VV-X14)^2
2255 LET D771=(AB-X15)^2: LET D772=(AD-X15)^2: LET D773=(AF-X15)^2
2260 LET D774=(AH-X15)^2: LET D775=(AJ-X15)^2: LET D776=(AL-X15)^2
2265 LET D778=(AP-X15)^2
2270 LET D881=(AC-X16)^2: LET D882=(AE-X16)^2: LET D883=(AG-X16)^2
2275 LET D884=(AI-X16)^2: LET D885=(AK-X16)^2: LET D886=(AM-X16)^2
2280 LET D887=(AO-X16)^2
2285 REM-------------------------------------------------
2290 LET D9 =SQR((D112+D113+D114+D115+D116+D117+D118)/7)
2295 LET D10=SQR((D221+D223+D224+D225+D226+D227+D228)/7)
2300 LET D11=SQR((D331+D332+D334+D335+D336+D337+D338)/7)
2305 LET D12=SQR((D441+D442+D443+D445+D446+D447+D448)/7)
2310 LET D13=SQR((D551+D552+D553+D554+D556+D557+D558)/7)
2315 LET D14=SQR((D661+D662+D663+D664+D665+D667+D668)/7)
2320 LET D15=SQR((D771+D772+D773+D774+D775+D776+D778)/7)
2325 LET D16=SQR((D881+D882+D883+D884+D885+D886+D887)/7)
2330 GOTO 2530
```



```
2335 REM-------------------------------------------------
2340 REM DISPLAY OLD RAW DATA MATRIX; 8 X 8 MATRIX
2345 REM-------------------------------------------------
2350 GOSUB 895
2355 GOSUB 1430
2360 GOSUB 1525
2365 LOCATE 1,1:PRINT QU$
2370 LOCATE 5,5:PRINT A: LOCATE 5,11:PRINT B: LOCATE 5,17:PRINT C
2375 LOCATE 5,23:PRINT D: LOCATE 5,29:PRINT E: LOCATE 5,35:PRINT F
2380 LOCATE 5,41:PRINT AB
2385 LOCATE 5,47:PRINT AC
2390 LOCATE 6,5:PRINT G: LOCATE 6,11:PRINT H: LOCATE 6,17:PRINT I
2395 LOCATE 6,23:PRINT J: LOCATE 6,29:PRINT K: LOCATE 6,35:PRINT L
2400 LOCATE 6,41:PRINT AD
2405 LOCATE 6,47:PRINT AE
2410 LOCATE 7,5:PRINT M: LOCATE 7,11:PRINT N: LOCATE 7,17:PRINT O
2415 LOCATE 7,23:PRINT P: LOCATE 7,29:PRINT Q: LOCATE 7,35:PRINT R
2420 LOCATE 7,41:PRINT AF
2425 LOCATE 7,47:PRINT AG
2430 LOCATE 8,5:PRINT S: LOCATE 8,11:PRINT T: LOCATE 8,17:PRINT U
2435 LOCATE 8,23:PRINT V: LOCATE 8,29:PRINT W: LOCATE 8,35:PRINT X
2440 LOCATE 8,41:PRINT AH
2445 LOCATE 8,47:PRINT AI
2450 LOCATE 9,5:PRINT Y: LOCATE 9,11:PRINT Z: LOCATE 9,17:PRINT AA
2455 LOCATE 9,23:PRINT BB: LOCATE 9,29:PRINT CC: LOCATE 9,35:PRINT
     DD
2460 LOCATE 9,41:PRINT AJ
2465 LOCATE 9,47:PRINT AK
2470 LOCATE 10,5:PRINT EE: LOCATE 10,11:PRINT FF: LOCATE
     10,17:PRINT GG
2475 LOCATE 10,23:PRINT HH: LOCATE 10,29:PRINT II: LOCATE
     10,35:PRINT JJ
2480 LOCATE 10,41:PRINT AL
2485 LOCATE 10,47:PRINT AM
2490 LOCATE 11,5:PRINT KK: LOCATE 11,11:PRINT LL: LOCATE 11,17:
     PRINT MM
2495 LOCATE 11,23:PRINT NN: LOCATE 11,29:PRINT OO: LOCATE 11,35:
     PRINT PP
2500 LOCATE 11,41:PRINT AN
2505 LOCATE 11,47:PRINT AO
2510 LOCATE 12,5:PRINT QQ: LOCATE 12,11:PRINT RR: LOCATE 12,17:
     PRINT SS
2515 LOCATE 12,23:PRINT TT: LOCATE 12,29:PRINT UU: LOCATE 12,35:
     PRINT VV
2520 LOCATE 12,41:PRINT AP: LOCATE 12,47:PRINT AQ
2525 REM-------------------------------------------------
2530 LOCATE 5,55:PRINT T1: LOCATE 5,61:PRINT FNR(X1): LOCATE 5,67:
     PRINT FNR(D1)
2535 LOCATE 6,55:PRINT T2: LOCATE 6,61:PRINT FNR(X2): LOCATE 6,67:
     PRINT FNR(D2)
2540 LOCATE 7,55:PRINT T3: LOCATE 7,61:PRINT FNR(X3): LOCATE 7,67:
     PRINT FNR(D3)
2545 LOCATE 8,55:PRINT T4: LOCATE 8,61:PRINT FNR(X4): LOCATE 8,67:
     PRINT FNR(D4)
2550 LOCATE 9,55:PRINT T5: LOCATE 9,61:PRINT FNR(X5): LOCATE 9,67:
     PRINT FNR(D5)
2555 LOCATE 10,55:PRINT T6: LOCATE 10,61:PRINT FNR(X6): LOCATE
     10,67: PRINT FNR(D6)
```

```
2560 LOCATE 11,55:PRINT T7: LOCATE 11,61:PRINT FNR(X7): LOCATE
     11,67: PRINT FNR(D7)
2565 LOCATE 12,55:PRINT T8: LOCATE 12,61:PRINT FNR(X8): LOCATE
     12,67: PRINT FNR(D8)
2570 LOCATE 14,55:PRINT"¦ Grand Total = "GTOTAL: LOCATE 15,55:
     PRINT"¦"
2575 LOCATE 16,55:PRINT"¦ Grand Mean  = "FNR(GMEAN)
2580 REM-----------------------------------------------
2585 LOCATE 14,5:PRINT T9: LOCATE 16,5:PRINT FNR(X9): LOCATE
     18,5:PRINT FNR(D9)
2590 LOCATE 14,11:PRINT T10: LOCATE 16,11:PRINT FNR(X10): LOCATE
     18,11: PRINT FNR(D10)
2595 LOCATE 14,17:PRINT T11: LOCATE 16,17:PRINT FNR(X11): LOCATE
     18,17: PRINT FNR(D11)
2600 LOCATE 14,23:PRINT T12: LOCATE 16,23:PRINT FNR(X12): LOCATE
     18,23: PRINT FNR(D12)
2605 LOCATE 14,29:PRINT T13: LOCATE 16,29:PRINT FNR(X13): LOCATE
     18,29: PRINT FNR(D13)
2610 LOCATE 14,35:PRINT T14: LOCATE 16,35:PRINT FNR(X14): LOCATE
     18,35: PRINT FNR(D14)
2615 LOCATE 14,41:PRINT T15: LOCATE 16,41:PRINT FNR(X15): LOCATE
     18,41: PRINT FNR(D15)
2620 LOCATE 14,47:PRINT T16: LOCATE 16,47:PRINT FNR(X16): LOCATE
     18,47: PRINT FNR(D16)
2625 GOTO 310
2630 REM-----------------------------------------------
2635 REM DEVIATIONS FROM ROW MEAN; 8 X 8 MATRIX
2640 REM-----------------------------------------------
2645 CLS: GOSUB 1430
2650 GOSUB 1590
2655 LOCATE 1,1:PRINT QU$;" (Deviations from row mean)"
2660 LOCATE 5,11:PRINT USING"###.##";RD12: LOCATE 5,17:PRINT
     USING"###.##";RD13
2665 LOCATE 5,23:PRINT USING"###.##";RD14: LOCATE 5,29:PRINT
     USING"###.##";RD15
2670 LOCATE 5,35:PRINT USING"###.##";RD16
2675 LOCATE 5,41:PRINT USING"###.##";RD17
2680 LOCATE 5,47:PRINT USING"###.##";RD18
2685 LOCATE 6,5:PRINT USING"###.##";RD21: LOCATE 6,17:PRINT
     USING"###.##";RD23
2690 LOCATE 6,23:PRINT USING"###.##";RD24: LOCATE 6,29:PRINT
     USING"###.##";RD25
2695 LOCATE 6,35:PRINT USING"###.##";RD26
2700 LOCATE 6,41:PRINT USING"###.##";RD27
2705 LOCATE 6,47:PRINT USING"###.##";RD28
2710 LOCATE 7,5:PRINT USING"###.##";RD31: LOCATE 7,11:PRINT
     USING"###.##";RD32
2715 LOCATE 7,23:PRINT USING"###.##";RD34: LOCATE 7,29:PRINT
     USING"###.##";RD35
2720 LOCATE 7,35:PRINT USING"###.##";RD36
2725 LOCATE 7,41:PRINT USING"###.##";RD37
2730 LOCATE 7,47:PRINT USING"###.##";RD38
2735 LOCATE 8,5:PRINT USING"###.##";RD41: LOCATE 8,11:PRINT
     USING"###.##";RD42
2740 LOCATE 8,17:PRINT USING"###.##";RD43: LOCATE 8,29:PRINT
     USING"###.##";RD45
2745 LOCATE 8,35:PRINT USING"###.##";RD46
2750 LOCATE 8,41:PRINT USING"###.##";RD47
```



```
2755 LOCATE 8,47:PRINT USING"###.##";RD48
2760 LOCATE 9,5:PRINT USING"###.##";RD51: LOCATE 9,11:PRINT
     USING"###.##";RD52
2765 LOCATE 9,17:PRINT USING"###.##";RD53: LOCATE 9,23:PRINT
     USING"###.##";RD54
2770 LOCATE 9,35:PRINT USING"###.##";RD56
2775 LOCATE 9,41:PRINT USING"###.##";RD57
2780 LOCATE 9,47:PRINT USING"###.##";RD58
2785 LOCATE 10,5:PRINT USING"###.##";RD61: LOCATE 10,11:PRINT
     USING"###.##"; RD62
2790 LOCATE 10,17:PRINT USING"###.##";RD63: LOCATE 10,23:PRINT
     USING"###.##"; RD64
2795 LOCATE 10,29:PRINT USING"###.##";RD65
2800 LOCATE 10,41:PRINT USING"###.##";RD67
2805 LOCATE 10,47:PRINT USING"###.##";RD68
2810 LOCATE 11,5:PRINT USING"###.##";RD71: LOCATE 11,11:PRINT
     USING"###.##"; RD72
2815 LOCATE 11,17:PRINT USING"###.##";RD73: LOCATE 11,23:PRINT
     USING"###.##"; RD74
2820 LOCATE 11,29:PRINT USING"###.##";RD75: LOCATE 11,35:PRINT
     USING"###.##"; RD76
2825 LOCATE 11,47:PRINT USING"###.##";RD78
2830 LOCATE 12,5:PRINT USING"###.##";RD81: LOCATE 12,11:PRINT
     USING"###.##"; RD82
2835 LOCATE 12,17:PRINT USING"###.##";RD83: LOCATE 12,23:PRINT
     USING"###.##"; RD84
2840 LOCATE 12,29:PRINT USING"###.##";RD85: LOCATE 12,35:PRINT
     USING"###.##"; RD86
2845 LOCATE 12,41:PRINT USING"###.##";RD87
2850 REM-----------------------------------------------
2855 LET TD1=(RD21+RD31+RD41+RD51+RD61+RD71+RD81)
2860 LET TD2=(RD12+RD32+RD42+RD52+RD62+RD72+RD82)
2865 LET TD3=(RD13+RD23+RD43+RD53+RD63+RD73+RD83)
2870 LET TD4=(RD14+RD24+RD34+RD54+RD64+RD74+RD84)
2875 LET TD5=(RD15+RD25+RD35+RD45+RD65+RD75+RD85)
2880 LET TD6=(RD16+RD26+RD36+RD46+RD56+RD76+RD86)
2885 LET TD7=(RD17+RD27+RD37+RD47+RD57+RD67+RD87)
2890 LET TD8=(RD18+RD28+RD38+RD48+RD58+RD68+RD78)
2895 REM-CALCULATE-&-PRINT-MEANS----------------------
2900 LOCATE 14,5:PRINT FNR(FNM(TD1)): LOCATE 14,11: PRINT
     FNR(FNM(TD2))
2905 LOCATE 14,17:PRINT FNR(FNM(TD3)): LOCATE 14,23: PRINT
     FNR(FNM(TD4))
2910 LOCATE 14,29:PRINT FNR(FNM(TD5)): LOCATE 14,35: PRINT
     FNR(FNM(TD6))
2915 LOCATE 14,41:PRINT FNR(FNM(TD7)): LOCATE 14,47: PRINT
     FNR(FNM(TD8))
2920 GOTO 310
2925 REM-----------------------------------------------
2930 REM RANKING ROUTINE (All sizes)
2935 REM-----------------------------------------------
2940 KW$="0"
2945 LET RDATA(1,1)=-99: LET RDATA(1,2)=B: LET RDATA(1,3)=C: LET
     RDATA(1,4)=D
2950 LET RDATA(1,5)=E: LET RDATA(1,6)=F: LET RDATA(2,1)=G: LET
     RDATA(2,2)=-99
2955 LET RDATA(2,3)=I: LET RDATA(2,4)=J: LET RDATA(2,5)=K: LET
     RDATA(2,6)=L
```

```
2960 LET RDATA(3,1)=M: LET RDATA(3,2)=N: LET RDATA(3,3)=-99: LET
     RDATA(3,4)=P
2965 LET RDATA(3,5)=Q: LET RDATA(3,6)=R: LET RDATA(4,1)=S: LET
     RDATA(4,2)=T
2970 LET RDATA(4,3)=U: LET RDATA(4,4)=-99: LET RDATA(4,5)=W: LET
     RDATA(4,6)=X
2975 LET RDATA(5,1)=Y: LET RDATA(5,2)=Z: LET RDATA(5,3)=AA: LET
     RDATA(5,4)=BB
2980 LET RDATA(5,5)=-99: LET RDATA(5,6)=DD: LET RDATA(6,1)=EE: LET
     RDATA(6,2)=FF
2985 LET RDATA(6,3)=GG: LET RDATA(6,4)=HH: LET RDATA(6,5)=II: LET
     RDATA(6,6)=-99
2990 LET RDATA(1,7)=AB: LET RDATA(2,7)=AD: LET RDATA(3,7)=AF: LET
     RDATA(4,7)=AH
2995 LET RDATA(5,7)=AJ: LET RDATA(6,7)=AL: LET RDATA(7,7)=-99
3000 LET RDATA(7,1)=KK: LET RDATA(7,2)=LL: LET RDATA(7,3)=MM: LET
     RDATA(7,4)=NN
3005 LET RDATA(7,5)=OO: LET RDATA(7,6)=PP
3010 LET RDATA(1,8)=AC: LET RDATA(2,8)=AE: LET RDATA(3,8)=AG: LET
     RDATA(4,8)=AI
3015 LET RDATA(5,8)=AK: LET RDATA(6,8)=AM: LET RDATA(7,8)=AO: LET
     RDATA(8,8)=-99
3020 LET RDATA(8,1)=QQ: LET RDATA(8,2)=RR: LET RDATA(8,3)=SS: LET
     RDATA(8,4)=TT
3025 LET RDATA(8,5)=UU: LET RDATA(8,6)=VV: LET RDATA(8,7)=AP
3030 REM-----------------------------------------------
3035 GOTO 3200
3040 COLOR 10,2,2
3045 CLS:LOCATE 12,12:PRINT"I am going into DEEP THOUGHT. Please
     do not disturb"
3050 FOR ROW%=1 TO N%
3055 FOR COL%=1 TO N%
3060 IF RDATA(ROW%,COL%)=-1, THEN RANK(ROW%,COL%)=-1: GOTO 3105
3065 COUNT%=1
3070 FOR K%=1 TO N%
3075 IF ROW%=COL% THEN GOTO 3105
3080 IF K%=COL%, THEN GOTO 3095
3085 IF RDATA(ROW%,K%)=-1, THEN GOTO 3095
3090 IF RDATA(ROW%,COL%)<RDATA(ROW%,K%) THEN COUNT%=COUNT%+1
3095 NEXT K%
3100 RANK(ROW%,COL%)=COUNT%
3105 NEXT COL%
3110 NEXT ROW%
3115 COLOR 4,2,2: BEEP: LOCATE 12,12:PRINT"
   STAND BY                "
3120 'COMPUTE TIES-------------------------------------
3125 FOR ROW%=1 TO N%
3130 FOR COL%=1 TO N%
3135 IF RDATA(ROW%,COL%)=-1 THEN GOTO 3180
3140 T%=0
3145 FOR K%=1 TO N%
3150 IF ROW%=COL%, THEN GOTO 3180
3155 IF K%=COL% OR RDATA(ROW%,K%)=-1 THEN GOTO 3165
3160 IF RDATA(ROW%,COL%)=RDATA(ROW%,K%) THEN T%=T%+1
3165 NEXT K%
3170 IF T%=0 THEN GOTO 3180
3175 RANK(ROW%,COL%)=((RANK(ROW%,COL%)+RANK(ROW%,COL%)+T%)/2)
3180 NEXT COL%
```



```
3185 NEXT ROW%
3190 COLOR 15,0,3: CLS
3195 RETURN
3200 GOSUB 3040
3205 REM-----------------------------------------------
3210 REM PRINT RANKS AND CALCULATE MEANS
3215 REM-----------------------------------------------
3220 GOSUB 895
3225 CLS:GOSUB 1430
3230 GOSUB 1590
3235 LOCATE 1,1:PRINT QU$;" (Mean Ranks)"
3240 LOCATE 5,11:PRINT RANK(1,2): LOCATE 5,17:PRINT RANK(1,3)
3245 LOCATE 5,23:PRINT RANK(1,4): LOCATE 5,29:PRINT RANK(1,5)
3250 LOCATE 5,35:PRINT RANK(1,6)
3255 LOCATE 5,41:PRINT RANK(1,7)
3260 LOCATE 5,47:PRINT RANK(1,8)
3265 LOCATE 6,5:PRINT RANK(2,1): LOCATE 6,17:PRINT RANK(2,3)
3270 LOCATE 6,23:PRINT RANK(2,4): LOCATE 6,29:PRINT RANK(2,5)
3275 LOCATE 6,35:PRINT RANK(2,6)
3280 LOCATE 6,41:PRINT RANK(2,7)
3285 LOCATE 6,47:PRINT RANK(2,8)
3290 LOCATE 7,5:PRINT RANK(3,1): LOCATE 7,11:PRINT RANK(3,2)
3295 LOCATE 7,23:PRINT RANK(3,4): LOCATE 7,29:PRINT RANK(3,5)
3300 LOCATE 7,35:PRINT RANK(3,6)
3305 LOCATE 7,41:PRINT RANK(3,7)
3310 LOCATE 7,47:PRINT RANK(3,8)
3315 LOCATE 8,5:PRINT RANK(4,1): LOCATE 8,11:PRINT RANK(4,2)
3320 LOCATE 8,17:PRINT RANK(4,3): LOCATE 8,29:PRINT RANK(4,5)
3325 LOCATE 8,35:PRINT RANK(4,6)
3330 LOCATE 8,41:PRINT RANK(4,7)
3335 LOCATE 8,47:PRINT RANK(4,8)
3340 LOCATE 9,5:PRINT RANK(5,1): LOCATE 9,11:PRINT RANK(5,2)
3345 LOCATE 9,17:PRINT RANK(5,3): LOCATE 9,23:PRINT RANK(5,4)
3350 LOCATE 9,35:PRINT RANK(5,6)
3355 LOCATE 9,41:PRINT RANK(5,7)
3360 LOCATE 9,47:PRINT RANK(5,8)
3365 LOCATE 10,5:PRINT RANK(6,1): LOCATE 10,11:PRINT RANK(6,2)
3370 LOCATE 10,17:PRINT RANK(6,3): LOCATE 10,23:PRINT RANK(6,4)
3375 LOCATE 10,29:PRINT RANK(6,5)
3380 LOCATE 10,41:PRINT RANK(6,7)
3385 LOCATE 10,47:PRINT RANK(6,8)
3390 LOCATE 11,5:PRINT RANK(7,1): LOCATE 11,11:PRINT RANK(7,2)
3395 LOCATE 11,17:PRINT RANK(7,3): LOCATE 11,23:PRINT RANK(7,4)
3400 LOCATE 11,29:PRINT RANK(7,5): LOCATE 11,35:PRINT RANK(7,6)
3405 LOCATE 11,47:PRINT RANK(7,8): LOCATE 12,5:PRINT RANK(8,1)
3410 LOCATE 12,11:PRINT RANK(8,2): LOCATE 12,17:PRINT RANK(8,3)
3415 LOCATE 12,23:PRINT RANK(8,4): LOCATE 12,29:PRINT RANK(8,5)
3420 LOCATE 12,35:PRINT RANK(8,6): LOCATE 12,41:PRINT RANK(8,7)
3425 REM-CALCULATE-MEANS--------------------------------
3430 K%=1
3435 FOR CL%=1 TO N%
3440 MRANK(1,CL%)=0
3445 FOR RO%=1 TO N%
3450 IF RO%=CL% GOTO 3460
3455 MRANK(1,CL%)=MRANK(1,CL%)+RANK(RO%,CL%)
3460 NEXT RO%
3465 MRANK(1,CL%)=FNM(MRANK(1,CL%))
3470 NEXT CL%
```

```
3475 REM-PRINT-MEANS-----------------------------------
3480 LOCATE 14,5:PRINT FNR(MRANK(1,1)): LOCATE 14,11: PRINT
     FNR(MRANK(1,2))
3485 LOCATE 14,17:PRINT FNR(MRANK(1,3)): LOCATE 14,23: PRINT
     FNR(MRANK(1,4))
3490 LOCATE 14,29:PRINT FNR(MRANK(1,5)): LOCATE 14,35: PRINT
     FNR(MRANK(1,6))
3495 LOCATE 14,41:PRINT FNR(MRANK(1,7)): LOCATE 14,47: PRINT
     FNR(MRANK(1,8))
3500 IF KW$="1" GOTO 3625
3505 BEEP:COLOR 12,0,3:LOCATE 17,1:PRINT"STAND BY; Calculating
     Kendall's W"
3510 REM-------------------------------------------------
3515 FOR CL%=1 TO N%                'Deviations
3520 FOR RO%=1 TO N%
3525 K%=RO%+1
3530 IF RO%=CL% GOTO 3540
3535 MRANK(K%,CL%)=(RANK(RO%,CL%)-MRANK(1,CL%))^2
3540 NEXT RO%
3545 NEXT CL%
3550 K%=N%+2                        'Standard deviations
3555 FOR CL%=1 TO N%
3560 MRANK(K%,CL%)=0
3565 FOR RO%=2 TO N%+1
3570 MRANK(K%,CL%)=MRANK(K%,CL%)+MRANK(RO%,CL%)
3575 NEXT RO%
3580 MRANK(K%,CL%)=SQR(FNM(MRANK(K%,CL%)))
3585 NEXT CL%
3590 SDR=0
3595 FOR CL%=1 TO N%
3600 SDR=SDR+MRANK(K%,CL%)
3605 NEXT CL%
3610 SDR=SDR/N%
3615 KN=2
3620 SIGMA=(1-(SDR/KN)): GOSUB 4040
3625 K%=N%+2
3630 LOCATE 17,1:PRINT"KENDALL'S W (Taylor's Modification) =
     ";FNR(KW);"  (S' = ";SQS;")
3635 LOCATE 18,1:PRINT"Chi Square = ";FNR(CHI): LOCATE
     19,1:PRINT"SDr: ";: FOR CL%=1 TO N%
3640 PRINT FNR(MRANK(K%,CL%));: NEXT CL%
3645 LOCATE 20,1:PRINT"Xsdr = ";SDR;" Sigma = ";FNR(SIGMA): GOTO
     310
3650 REM-------------------------------------------------
3655 REM CALCULATE RANKS FOR SUMMARIES
3660 REM-------------------------------------------------
3665 LET RSUM(1,1)=X9: LET RSUM(1,2)=X10: LET RSUM(1,3)=X11
3670 LET RSUM(1,4)=X12: LET RSUM(1,5)=X13: LET RSUM(1,6)=X14
3675 LET RSUM(1,7)=X15: LET RSUM(1,8)=X16
3680 LET RSUM(2,1)=FNM(TD1): LET RSUM(2,2)=FNM(TD2): LET
     RSUM(2,3)=FNM(TD3)
3685 LET RSUM(2,4)=FNM(TD4): LET RSUM(2,5)=FNM(TD5): LET
     RSUM(2,6)=FNM(TD6)
3690 LET RSUM(2,7)=FNM(TD7): LET RSUM(2,8)=FNM(TD8)
3695 LET RSUM(3,1)=(1/MRANK(1,1)): LET RSUM(3,2)=
     (1/MRANK(1,2)): LET RSUM(3,3)=(1/MRANK(1,3))
3700 LET RSUM(3,4)=(1/MRANK(1,4)): LET RSUM(3,5)=
     (1/MRANK(1,5)): LET RSUM(3,6)=(1/MRANK(1,6))
```



```
3705 LET RSUM(3,7)=(1/MRANK(1,7)): LET RSUM(3,8)=(1/MRANK(1,8))
3710 REM-------------------------------------------------
3715 REM CALCULATE RANKS FOR SUMMARIES
3720 REM-------------------------------------------------
3725 GOTO 3850
3730 COLOR 13,5,12: CLS
3735 LOCATE 12,12:PRINT"I will now hibernate for a while: please
     be patient"
3740 FOR RO%=1 TO 3
3745 FOR CL%=1 TO N%
3750 COUNT%=1
3755 FOR KA%=1 TO N%
3760 IF RSUM(RO%,CL%)<RSUM(RO%,KA%) THEN COUNT%=COUNT%+1
3765 NEXT KA%
3770 SRANK(RO%,CL%)=COUNT%
3775 NEXT CL%
3780 NEXT RO%
3785 'COMPUTE TIES-----------------------------------------
3790 FOR RO%=1 TO 3
3795 FOR CL%=1 TO N%
3800 T%=0
3805 FOR KA%=1 TO N%
3810 IF RSUM(RO%,CL%)=RSUM(RO%,KA%) THEN T%=T%+1
3815 NEXT KA%
3820 IF T%=0 THEN GOTO 3830
3825 SRANK(RO%,CL%)=((SRANK(RO%,CL%)+SRANK(RO%,CL%)+T%-1)/2)
3830 NEXT CL%
3835 NEXT RO%
3840 COLOR 15,0,3:CLS
3845 RETURN
3850 GOSUB 3730
3855 REM-------------------------------------------------
3860 REM PRINT SUMMARIES; 8,Square MATRIX
3865 REM-------------------------------------------------
3870 GOSUB 510
3875 LOCATE 5,15:PRINT FNR(X9): LOCATE 5,21:PRINT FNR(X10)
3880 LOCATE 5,27:PRINT FNR(X11): LOCATE 5,33:PRINT FNR(X12)
3885 LOCATE 5,39:PRINT FNR(X13): LOCATE 5,45:PRINT FNR(X14)
3890 LOCATE 5,51:PRINT FNR(X15)
3895 LOCATE 5,57:PRINT FNR(X16)
3900 LOCATE 10,15:PRINT FNR(FNM(TD1)): LOCATE 10,21:PRINT
     FNR(FNM(TD2))
3905 LOCATE 10,27:PRINT FNR(FNM(TD3)): LOCATE 10,33:PRINT
     FNR(FNM(TD4))
3910 LOCATE 10,39:PRINT FNR(FNM(TD5)): LOCATE 10,45:PRINT
     FNR(FNM(TD6))
3915 LOCATE 10,51:PRINT FNR(FNM(TD7))
3920 LOCATE 10,57:PRINT FNR(FNM(TD8))
3925 LOCATE 15,15:PRINT FNR(MRANK(1,1)): LOCATE 15,21:PRINT
     FNR(MRANK(1,2))
3930 LOCATE 15,27:PRINT FNR(MRANK(1,3)): LOCATE 15,33:PRINT
     FNR(MRANK(1,4))
3935 LOCATE 15,39:PRINT FNR(MRANK(1,5)): LOCATE 15,45:PRINT
     FNR(MRANK(1,6))
3940 LOCATE 15,51:PRINT FNR(MRANK(1,7))
3945 LOCATE 15,57:PRINT FNR(MRANK(1,8))
3950 REM-------------------------------------------------
3955 LOCATE 7,15:PRINT SRANK(1,1): LOCATE 7,21:PRINT SRANK(1,2)
```

```
3960 LOCATE 7,27:PRINT SRANK(1,3): LOCATE 7,33:PRINT SRANK(1,4)
3965 LOCATE 7,39:PRINT SRANK(1,5): LOCATE 7,45:PRINT SRANK(1,6)
3970 LOCATE 7,51:PRINT SRANK(1,7): LOCATE 7,57:PRINT SRANK(1,8)
3975 LOCATE 12,15:PRINT SRANK(2,1): LOCATE 12,21:PRINT SRANK(2,2)
3980 LOCATE 12,27:PRINT SRANK(2,3): LOCATE 12,33:PRINT SRANK(2,4)
3985 LOCATE 12,39:PRINT SRANK(2,5): LOCATE 12,45:PRINT SRANK(2,6)
3990 LOCATE 12,51:PRINT SRANK(2,7): LOCATE 12,57:PRINT SRANK(2,8)
3995 LOCATE 17,15:PRINT SRANK(3,1): LOCATE 17,21:PRINT SRANK(3,2)
4000 LOCATE 17,27:PRINT SRANK(3,3): LOCATE 17,33:PRINT SRANK(3,4)
4005 LOCATE 17,39:PRINT SRANK(3,5): LOCATE 17,45:PRINT SRANK(3,6)
4010 LOCATE 17,51:PRINT SRANK(3,7): LOCATE 17,57:PRINT SRANK(3,8)
4015 LOCATE 20,1:PRINT"KENDALL'S W (Taylor's Modification) =
     ";FNR(KW);"  (S' = ";SQS;")"
4020 LOCATE 21,1:PRINT"Chi Square = ";FNR(CHI): LOCATE 22,1:
     PRINT"Sigma = ";FNR(SIGMA)
4025 COLOR 15,0,3
4030 GOTO 310
4035 REM-------------------------------------------------
4040 'CALCULATE KENDALL'S W
4045 REM-------------------------------------------------
4050 STI=0
4055 KW$="1"
4060 FOR RO%=1 TO N%                    'CLEAR TIE%
4065 FOR CL%=1 TO TI%
4070 TIE%(RO%,CL%)=0
4075 NEXT CL%
4080 NEXT RO%
4085 FOR CL%=1 TO N%                    'Sum ranks by column
4090 TRANK(1,CL%)=0
4095 FOR RO%=1 TO N%
4100 IF RO%=CL% GOTO 4110
4105 TRANK(1,CL%)=TRANK(1,CL%)+RANK(RO%,CL%)
4110 NEXT RO%
4115 NEXT CL%
4120 FOR CL%=1 TO N%                    'Squared deviations
4125 TRANK(1,CL%)=(TRANK(1,CL%)-(N%*(N%-1))/2)^2
4130 NEXT CL%
4135 FOR CL%=1 TO N%                    'Sum squared deviations
4140 IF CL%=1 GOTO 4150
4145 TRANK(1,1)=TRANK(1,1)+TRANK(1,CL%)
4150 NEXT CL%
4155 SQS=TRANK(1,1)*((N%^2)/(N%-2)^2)   ' COMPUTE S
4160 FOR RO%=1 TO N%                    'Compute denominator
4165 FOR CL%=1 TO N%
4170 TDATA(RO%,CL%)=RANK(RO%,CL%)
4175 NEXT CL%
4180 NEXT RO%
4185 FOR RO%=1 TO N%                    'COUNT TIES BY SET BY ROW
4190 J%=1
4195 FOR CL%=1 TO N%
4200 T%=0
4205 FOR K%=1 TO N%
4210 IF RO%=CL% GOTO 4265
4215 IF K%=CL% GOTO 4240
4220 IF K%<CL% GOTO 4240
4225 IF TDATA(RO%,K%)=-2 GOTO 4240
4230 IF TDATA(RO%,CL%)=TDATA(RO%,K%) THEN T%=T%+1
4235 IF TDATA(RO%,CL%)=TDATA(RO%,K%) THEN TDATA(RO%,K%)=-2
```



```
4240 NEXT K%
4245 IF T%=0 GOTO 4265
4250 TIE%(RO%,J%)=T%+1
4255 J%=J%+1
4260 IF J%>TI% GOTO 4270
4265 NEXT CL%
4270 NEXT RO%
4275 FOR RO%=1 TO N%                    'PRINT TIE%-----------
4280 FOR CL%=1 TO TI%
4285 LPRINT TIE%(RO%,CL%);:NEXT CL%
4290 LPRINT: NEXT RO%                   'END PRINT TIE%-------
4295 FOR RO%=1 TO N%                    'Compute Sigma T
4300 FOR CL%=1 TO TI%
4305 TIE%(RO%,CL%)=(TIE%(RO%,CL%)^3)-TIE%(RO%,CL%)
4310 NEXT CL%
4315 NEXT RO%
4320 FOR RO%=1 TO N%
4325 FOR CL%=1 TO TI%
4330 IF CL%=1 GOTO 4340
4335 TIE%(RO%,1)=TIE%(RO%,1)+TIE%(RO%,CL%)
4340 NEXT CL%
4345 TTIE(RO%,1)=TIE%(RO%,1)/12
4350 NEXT RO%
4355 FOR RO%=1 TO N%
4360 STI=STI+TTIE(RO%,1)
4365 NEXT RO%
4370 STI=((N%^3)*((N%^2)-1)/12)-(N%*STI)
4375 KW=SQS/STI: CHI=N%*(N%-1)*KW
4380 BEEP:COLOR 15,0,3
4385 RETURN
4390 IF GATE%<>1 THEN GOTO 4405
4395 WRITE #1,SC$,GN$,SN$,SD$,N%,QU$,A,B,C,D,E,F,AB,AC,
     G,H,I,J,K,L,AD,AE,M,N,O,P,Q,R,AF,AG,S,T,U,V,W,X,
     AH,AI,Y,Z,AA,BB,CC,DD,AJ,AK,EE,FF,GG,HH,II,JJ,AL,
     AM,KK,LL,MM,NN,OO,PP,AN,AO,QQ,RR,SS,TT,UU,VV,AP,AQ
4400 CLOSE #1
4405 NEXT QU
4410 END
```

```
1 '=================================================
2 'PROGRAM SYMLOG
3 '=================================================
5 KEY OFF
10 COLOR 14,1,3
15 DEF FND(X)=INT((8*X)/100)+1
20  CLS:LOCATE 11,4:INPUT"Is this a continuation of data input for
    the same group? (Y/N) ",PORT$
25 GOTO 35
30 RESTORE
35 LET FLAG%=0
40 REM-------------------------------------------------
45 REM INPUT GROUP AND SERIES DETAILS
50 REM-------------------------------------------------
55 IF PORT$="Y" THEN OPEN "DETAIL" FOR INPUT AS #2
60 IF PORT$="Y"  THEN  INPUT  #2,SC$,GN$,SN$,SD$,N%,DOOR$,GATE%:
    CLOSE #2
```

```
65 IF PORT$="Y" GOTO 395
70 CLS
75 LOCATE 4,25:INPUT"[1] WHAT IS THE SERIES CODE? _____",SC$
80 LOCATE 6,25:INPUT"[2] WHAT IS THE GROUP NUMBER? ____",GN$
85 LOCATE 8,25:INPUT"[3] WHAT IS THE SESSION NUMBER? __",SN$
90 LOCATE 10,25:INPUT"[4] WHAT IS THE SESSION DATE? ____",SD$
95 LOCATE 12,25:INPUT"[5] HOW MANY GROUP MEMBERS? ______",N%
100 LOCATE 16,25:INPUT"ARE THESE DETAILS CORRECT? (Y/N) ",D$
105 IF D$="Y" GOTO 385
110 IF D$="N" GOTO 140
115 BEEP: LOCATE 18,25:PRINT"PLEASE TYPE Y or N"
120 GOTO 100
125 REM-------------------------------------------------
130 REM DETAIL AMENDMENT ROUTINE
135 REM-------------------------------------------------
140 LOCATE 18,25:PRINT"WHAT DO YOU WANT TO ALTER?     "
145 LOCATE 20,25: INPUT"PLEASE TYPE: All, 1, 2, 3, 4, or 5. ",A$
150 IF A$="ALL" GOTO 70
155 IF A$="1" THEN GOSUB 215
160 IF A$="2" THEN GOSUB 240
165 IF A$="3" THEN GOSUB 265
170 IF A$="4" THEN GOSUB 290
175 IF A$="5" THEN GOSUB 315
180 LOCATE 20,25:PRINT"                                  "
185 LOCATE 18,25:INPUT"DO YOU WANT TO ALTER ANYTHING  ELSE?  (Y/N)
    ",B$
190 IF B$="Y" GOTO 140
195 IF B$="N" GOTO 385
200 BEEP: LOCATE 20,25:PRINT"PLEASE TYPE Y or N       "
205 GOTO 185
210 REM-------------------------------------------------
215 REM SUBROUTINE: ALTER SERIES CODE
220 REM-------------------------------------------------
225 LOCATE 4,59:INPUT"",SC$
230 RETURN
235 REM-------------------------------------------------
240 REM SUBROUTINE: ALTER GROUP NUMBER
245 REM-------------------------------------------------
250 LOCATE 6,59:INPUT"",GN$
255 RETURN
260 REM-------------------------------------------------
265 REM SUBROUTINE: ALTER SESSION NUMBER
270 REM-------------------------------------------------
275 LOCATE 8,59:INPUT"",SN$
280 RETURN
285 REM-------------------------------------------------
290 REM SUBROUTINE: ALTER SESSION DATE
295 REM-------------------------------------------------
300 LOCATE 10,59:INPUT"",SD$
305 RETURN
310 REM-------------------------------------------------
315 REM SUBROUTINE: ALTER GROUP SIZE
320 REM-------------------------------------------------
325 LOCATE 12,59:INPUT"",N%
330 RETURN
335 REM-------------------------------------------------
340 REM SUBROUTINE: PRINT GROUP DETAILS
345 REM-------------------------------------------------
```



```
350 GOTO 375
355 CLS
360 LOCATE 1,1:PRINT SC$;".  Gn:  ";GN$;". N: ";N%;". Sn: ";SN$;".
    Date: ";SD$;       ". Subject: ";Q
365 LOCATE 2,1:PRINT"-------------------------------------
    ----------------------------------------"
370 RETURN
375 GOSUB 355
380 REM-------------------------------------------------
385 CLOSE #2: OPEN "DETAIL" FOR OUTPUT AS #2
390 WRITE #2,SC$,GN$,SN$,SD$,N%,DOOR$,GATE%: CLOSE #2
395 FOR Q = 1 TO N%
400 REM-------------------------------------------------
405 REM RESET KEY
410 REM-------------------------------------------------
415 LET SU%=0
420 LET SUP%=0
425 LET SUPF%=0
430 LET SUF%=0
435 LET SUNF%=0
440 LET SUN%=0
445 LET SUNB%=0
450 LET SUB%=0
455 LET SUPB%=0
460 LET SP%=0
465 LET SPF%=0
470 LET SF%=0
475 LET SNF%=0
480 LET SN%=0
485 LET SNB%=0
490 LET SB%=0
495 LET SPB%=0
500 LET SDP%=0
505 LET SDPF%=0
510 LET SDF%=0
515 LET SDNF%=0
520 LET SDN%=0
525 LET SDNB%=0
530 LET SDB%=0
535 LET SDPB%=0
540 LET SD%=0
545 REM-------------------------------------------------
550 LET WU%=0
555 LET WUP%=0
560 LET WUPF%=0
565 LET WUF%=0
570 LET WUNF%=0
575 LET WUN%=0
580 LET WUNB%=0
585 LET WUB%=0
590 LET WUPB%=0
595 LET WP%=0
600 LET WPF%=0
605 LET WF%=0
610 LET WNF%=0
615 LET WN%=0
620 LET WNB%=0
625 LET WB%=0
```

```
630 LET WPB%=0
635 LET WDP%=0
640 LET WDPF%=0
645 LET WDF%=0
650 LET WDNF%=0
655 LET WDN%=0
660 LET WDNB%=0
665 LET WDB%=0
670 LET WDPB%=0
675 LET WD%=0
680 REM-------------------------------------------------
685 LET LU%=0
690 LET LUP%=0
695 LET LUPF%=0
700 LET LUF%=0
705 LET LUNF%=0
710 LET LUN%=0
715 LET LUNB%=0
720 LET LUB%=0
725 LET LUPB%=0
730 LET LP%=0
735 LET LPF%=0
740 LET LF%=0
745 LET LNF%=0
750 LET LN%=0
755 LET LNB%=0
760 LET LB%=0
765 LET LPB%=0
770 LET LDP%=0
775 LET LDPF%=0
780 LET LDF%=0
785 LET LDNF%=0
790 LET LDN%=0
795 LET LDNB%=0
800 LET LDB%=0
805 LET LDPB%=0
810 LET LD%=0
815 REM-------------------------------------------------
820 LET MU%=0
825 LET MUP%=0
830 LET MUPF%=0
835 LET MUF%=0
840 LET MUNF%=0
845 LET MUN%=0
850 LET MUNB%=0
855 LET MUB%=0
860 LET MUPB%=0
865 LET MP%=0
870 LET MPF%=0
875 LET MF%=0
880 LET MNF%=0
885 LET MN%=0
890 LET MNB%=0
895 LET MB%=0
900 LET MPB%=0
905 LET MDP%=0
910 LET MDPF%=0
915 LET MDF%=0
```



```
920 LET MDNF%=0
925 LET MDN%=0
930 LET MDNB%=0
935 LET MDB%=0
940 LET MDPB%=0
945 LET MD%=0
950 REM-------------------------------------------------
955 LET US%=0
960 LET DS%=0
965 LET PS%=0
970 LET NS%=0
975 LET FS%=0
980 LET BS%=0
985 REM-------------------------------------------------
990 LET UW%=0
995 LET DW%=0
1000 LET PW%=0
1005 LET NW%=0
1010 LET FW%=0
1015 LET BW%=0
1020 REM-------------------------------------------------
1025 LET UL%=0
1030 LET DL%=0
1035 LET PL%=0
1040 LET NL%=0
1045 LET FL%=0
1050 LET BL%=0
1055 REM-------------------------------------------------
1060 LET UM%=0
1065 LET DM%=0
1070 LET PM%=0
1075 LET NM%=0
1080 LET FM%=0
1085 LET BM%=0
1090 REM-------------------------------------------------
1095 LET A=0:  LET B=0:  LET C=0:  LET D=0:  LET E=0: LET F=0: LET
     G=0:  LET H=0: LET I=0: LET J=0: LET K=0: LET L=0: LET M=0:
     LET N=0: LET O=0: LET P=0
1100 LET A1=0:  LET B1=0:  LET C1=0: LET D1=0: LET E1=0: LET F1=0:
     LET G1=0: LET H1=0: LET I1=0: LET J1=0: LET K1=0: LET L1=0:
     LET M1=0: LET N1=0: LET O1=0: LET P1=0
1105 LET A2=0:  LET B2=0:  LET C2=0: LET D2=0: LET E2=0: LET F2=0:
     LET G2=0: LET H2=0: LET I2=0: LET J2=0: LET K2=0: LET L2=0:
     LET M2=0: LET N2=0: LET O2=0: LET P2=0
1110 LET A3=0:  LET B3=0:  LET C3=0: LET D3=0: LET E3=0: LET F3=0:
     LET G3=0: LET H3=0: LET I3=0: LET J3=0: LET K3=0: LET L3=0:
     LET M3=0: LET N3=0: LET O3=0: LET P3=0
1115 LET A4=0:  LET B4=0:  LET C4=0: LET D4=0: LET E4=0: LET F4=0:
     LET G4=0: LET H4=0: LET I4=0: LET J4=0: LET K4=0: LET L4=0:
     LET M4=0: LET N4=0: LET O4=0: LET P4=0
1120 LET A5=0:  LET B5=0:  LET C5=0: LET D5=0: LET E5=0: LET F5=0:
     LET G5=0: LET H5=0: LET I5=0: LET J5=0: LET K5=0: LET L5=0:
     LET M5=0: LET N5=0: LET O5=0: LET P5=0
1125 LET A6=0:  LET B6=0:  LET C6=0: LET D6=0: LET E6=0: LET F6=0:
     LET G6=0: LET H6=0: LET I6=0: LET J6=0: LET K6=0: LET L6=0:
     LET M6=0: LET N6=0: LET O6=0: LET P6=0
1130 LET A7=0:  LET B7=0:  LET C7=0: LET D7=0: LET E7=0: LET F7=0:
     LET G7=0: LET H7=0: LET I7=0: LET J7=0: LET K7=0: LET L7=0:
```

```
     LET M7=0: LET N7=0: LET O7=0: LET P7=0
1135 LET A8=0:  LET B8=0:  LET C8=0: LET D8=0: LET E8=0: LET F8=0:
     LET G8=0: LET H8=0: LET I8=0: LET J8=0: LET K8=0: LET L8=0:
     LET M8=0: LET N8=0: LET O8=0: LET P8=0
1140 LET A9=0:  LET B9=0:  LET C9=0: LET D9=0: LET E9=0: LET F9=0:
     LET G9=0: LET H9=0: LET I9=0: LET J9=0: LET K9=0: LET L9=0:
     LET M9=0: LET N9=0: LET O9=0: LET P9=0
1145 REM-------------------------------------------------
1150 LET LPC=0: LET LPCT=0: LET LPCS=0
1155 LET MPC=0: LET MPCT=0: LET MPCS=0
1160 LET ASO=0: LET ASOT=0: LET ASOS=0
1165 REM-------------------------------------------------
1170 LET CW%=0:  LET CH%=0:  LET SH%=0: LET PLA%=0: LET RI%=0: LET
     ME%=0: LET TW%=0: LET CF%=0
1175 REM-------------------------------------------------
1180 IF FLAG%=1, GOTO 1325
1185 REM-------------------------------------------------
1190 REM PRINT MAIN MENU
1195 REM-------------------------------------------------
1200 CLS
1205 GOSUB 355
1210 LOCATE 3,30:PRINT"MENU: INTRAPERSONAL SCALES"
1215 LOCATE 4,30:PRINT"-------------------------"
1220 LOCATE 6,26:PRINT"[1] INPUT OR RE-INPUT ASO (LPC/MPC)"
1225 LOCATE 7,26:PRINT"[2] INPUT OR RE-INPUT SYMLOG"
1230 LOCATE 8,26:PRINT"[3] INPUT BELBIN'S SPI"
1235 LOCATE 9,26:PRINT"[4] RE-INPUT BELBIN'S SPI"
1240 LOCATE 10,26:PRINT"[5] DISPLAY SYMLOG & ASO TOTALS"
1245 LOCATE 11,26:PRINT"[6] DISPLAY BELBIN'S SPI TOTALS"
1250 LOCATE 12,26:PRINT"[7] INPUT DATA FOR A NEW VICTIM"
1255 LOCATE 13,26:PRINT"[8] INPUT DATA FROM ANOTHER GROUP"
1260 LOCATE 14,26:PRINT"[9] RETURN TO MAIN MENU"
1265  LOCATE  20,26:INPUT"TELL  ME WHAT IS YOUR  PLEASURE  HERE  >
     ",CHOICE$
1270 IF CHOICE$ = "1", GOTO 3000
1275 IF CHOICE$ = "2", GOTO 1320
1280 IF CHOICE$ = "3", GOTO 5620
1285 IF CHOICE$ = "4", GOTO 5465
1290 IF CHOICE$ = "5", GOTO 4965
1295 IF CHOICE$ = "6", GOTO 6010
1300 IF CHOICE$ = "7", GOTO 6170
1305 IF CHOICE$="8", GOTO 30
1310 IF CHOICE$ = "9" THEN RUN "MENU"
1315 BEEP: GOTO 1265
1320 REM-------------------------------------------------
1325 REM SYMLOG SUB-MENU
1330 REM-------------------------------------------------
1335 CLS
1340 GOSUB 355
1345 LOCATE 3,29:PRINT"SYMLOG SUB-MENU"
1350 LOCATE 4,29:PRINT"---------------"
1355 LOCATE 6,26:PRINT"[1] INPUT SYMLOG SELF
1360 LOCATE 7,26:PRINT"[2] INPUT SYMLOG WISH
1365 LOCATE 8,26:PRINT"[3] INPUT SYMLOG LPC
1370 LOCATE 9,26:PRINT"[4] INPUT SYMLOG MPC
1375 LOCATE 10,26:PRINT"[5] INPUT SYMLOG TOTALS DIRECT"
1380 LOCATE 11,26:PRINT"[6] DISPLAY SYMLOG TOTALS"
1385 LOCATE 12,26:PRINT"[7] INPUT SYMLOG DATA FOR A NEW VICTIM"
```



```
1390  LOCATE  13,26:PRINT"[8]  RETURN TO  MENU  FOR  INTRAPERSONAL
      SCALES"
1395 LOCATE 14,26:PRINT"[9] RETURN TO MAIN MENU"
1400  LOCATE 20,26:INPUT"WHAT IS YOUR PLEASURE OH ILLUSTRIOUS ONE?
      ",CHOICE$
1405 IF CHOICE$="1", GOTO 1465
1410 IF CHOICE$="2", GOTO 1835
1415 IF CHOICE$="3", GOTO 2205
1420 IF CHOICE$="4", GOTO 2575
1425 IF CHOICE$="5", GOTO 3830
1430 IF CHOICE$="6", GOTO 4965
1435 IF CHOICE$="7", GOTO 1455
1440 IF CHOICE$="8", GOTO 1190
1445 IF CHOICE$="9" THEN RUN "MENU"
1450 BEEP: GOTO 1400
1455 LET FLAG%=1: GOTO 6170
1460 REM-------------------------------------------------
1465 REM INPUT SYMLOG SELF DATA
1470 REM-------------------------------------------------
1475 GOSUB 355
1480 LOCATE 1,70:PRINT"SELF"
1485 PRINT
1490 INPUT"  U ",SU%
1495 INPUT" UP ",SUP%
1500 INPUT"UPF ",SUPF%
1505 INPUT" UF ",SUF%
1510 INPUT"UNF ",SUNF%
1515 INPUT" UN ",SUN%
1520 INPUT"UNB ",SUNB%
1525 INPUT" UB ",SUB%
1530 INPUT"UPB ",SUPB%
1535 INPUT"  P ",SP%
1540 INPUT" PF ",SPF%
1545 INPUT"  F ",SF%
1550 INPUT" NF ",SNF%
1555 INPUT"  N ",SN%
1560 INPUT" NB ",SNB%
1565 INPUT"  B ",SB%
1570 INPUT" PB ",SPB%
1575 INPUT" DP ",SDP%
1580 INPUT"DPF ",SDPF%
1585 INPUT" DF ",SDF%
1590 INPUT"DNF ",SDNF%
1595 INPUT" DN ",SDN%
1600 INPUT"DNB ",SDNB%
1605 INPUT" DB ",SDB%
1610 INPUT"DPB ",SDPB%
1615 INPUT"  D ",SD%
1620 INPUT"",K$
1625 REM-------------------------------------------------
1630 REM PRINT U,D,P,N,F,B & Totals for SYMLOG Self
1635 REM-------------------------------------------------
1640 GOSUB 355
1645 GOSUB 2960
1650 LOCATE  3,30:PRINT"TOTALS  FOR":  LOCATE  4,30:PRINT  "SYMLOG
      SELF"
1655 LOCATE 5,30:PRINT"--------------"
1660 LET US%=(SU%+SUP%+SUPF%+SUF%+SUNF%+SUN%+SUNB%+SUB%+SUPB%)
```

```
1665 LET DS%=(SDP%+SDPF%+SDF%+SDNF%+SDN%+SDNB%+SDB%+SDPB%+SD%)
1670 LET PS%=(SUP%+SUPF%+SUPB%+SP%+SPF%+SPB%+SDP%+SDPF%+SDPB%)
1675 LET NS%=(SUNF%+SUN%+SUNB%+SNF%+SN%+SNB%+SDNF%+SDN%+SDNB%)
1680 LET FS%=(SUPF%+SUF%+SUNF%+SPF%+SF%+SNF%+SDPF%+SDF%+SDNF%)
1685 LET BS%=(SUNB%+SUB%+SUPB%+SNB%+SB%+SPB%+SDNB%+SDB%+SDPB%)
1690 REM-------------------------------------------------
1695 LET SUD% = US%-DS%
1700 IF US%<DS%, THEN SUD%=SUD%*(-1)
1705 LOCATE 7,30:PRINT"U    ";US%: LOCATE 9,30:PRINT "D    ";DS%
1710 IF US%<DS%, GOTO 1725
1715 IF US%>DS%, GOTO 1730
1720 LOCATE 8,40:PRINT "00": GOTO 1740
1725 LOCATE 8,38:PRINT SUD%;"D": GOTO 1740
1730 LOCATE 8,38:PRINT SUD%;"U"
1735 REM-------------------------------------------------
1740 LOCATE 11,30:PRINT"P    ";PS%: LOCATE 13,30:PRINT "N    ";NS%
1745 LET SPN% = PS%-NS%
1750 IF PS%<NS%, THEN SPN%=SPN%*(-1)
1755 IF PS%<NS%, GOTO 1770
1760 IF PS%>NS%, GOTO 1775
1765 LOCATE 12,40:PRINT"00":GOTO 1785
1770 LOCATE 12,38:PRINT SPN%;"N": GOTO 1785
1775 LOCATE 12,38:PRINT SPN%;"P"
1780 REM-------------------------------------------------
1785 LOCATE 15,30:PRINT"F    ";FS%: LOCATE 17,30:PRINT "B    ";BS%
1790 LET SFB% = FS%-BS%
1795 IF FS%<BS%, THEN SFB%=SFB%*(-1)
1800 IF FS%<BS%, GOTO 1815
1805 IF FS%>BS%, GOTO 1820
1810 LOCATE 16,40:PRINT"00":GOTO 1825
1815 LOCATE 16,38:PRINT SFB%;"B": GOTO 1825
1820 LOCATE 16,38:PRINT SFB%;"F"
1825 INPUT"",K$: GOTO 1325
1830 REM-------------------------------------------------
1835 REM INPUT SYMLOG WISH DATA
1840 REM-------------------------------------------------
1845 GOSUB 355
1850 LOCATE 1,70:PRINT"WISH"
1855 PRINT
1860 INPUT"  U ",WU%
1865 INPUT" UP ",WUP%
1870 INPUT"UPF ",WUPF%
1875 INPUT" UF ",WUF%
1880 INPUT"UNF ",WUNF%
1885 INPUT" UN ",WUN%
1890 INPUT"UNB ",WUNB%
1895 INPUT" UB ",WUB%
1900 INPUT"UPB ",WUPB%
1905 INPUT"  P ",WP%
1910 INPUT" PF ",WPF%
1915 INPUT"  F ",WF%
1920 INPUT" NF ",WNF%
1925 INPUT"  N ",WN%
1930 INPUT" NB ",WNB%
1935 INPUT"  B ",WB%
1940 INPUT" PB ",WPB%
1945 INPUT" DP ",WDP%
1950 INPUT"DPF ",WDPF%
```



```
1955 INPUT" DF ",WDF%
1960 INPUT"DNF ",WDNF%
1965 INPUT" DN ",WDN%
1970 INPUT"DNB ",WDNB%
1975 INPUT" DB ",WDB%
1980 INPUT"DPB ",WDPB%
1985 INPUT"  D ",WD%
1990 INPUT"",K$
1995 REM-------------------------------------------------
2000 REM PRINT U,D,P,N,F,B & Totals for SYMLOG Wish
2005 REM-------------------------------------------------
2010 GOSUB 355
2015 GOSUB 2960
2020 LOCATE 3,30:PRINT"TOTALS FOR": LOCATE 4,30:PRINT "SYMLOG
     WISH"
2025 LOCATE 5,30:PRINT"--------------"
2030 LET UW%=(WU%+WUP%+WUPF%+WUF%+WUNF%+WUN%+WUNB%+WUB%+WUPB%)
2035 LET DW%=(WDP%+WDPF%+WDF%+WDNF%+WDN%+WDNB%+WDB%+WDPB%+WD%)
2040 LET PW%=(WUP%+WUPF%+WUPB%+WP%+WPF%+WPB%+WDP%+WDPF%+WDPB%)
2045 LET NW%=(WUNF%+WUN%+WUNB%+WNF%+WN%+WNB%+WDNF%+WDN%+WDNB%)
2050 LET FW%=(WUPF%+WUF%+WUNF%+WPF%+WF%+WNF%+WDPF%+WDF%+WDNF%)
2055 LET BW%=(WUNB%+WUB%+WUPB%+WNB%+WB%+WPB%+WDNB%+WDB%+WDPB%)
2060 REM-------------------------------------------------
2065 LET WUD% = UW%-DW%
2070 IF UW%<DW%, THEN WUD%=WUD%*(-1)
2075 LOCATE 7,30:PRINT"U    ";UW%: LOCATE 9,30:PRINT "D    ";DW%
2080 IF UW%<DW%, GOTO 2095
2085 IF UW%>DW%, GOTO 2100
2090 LOCATE 8,40:PRINT "00": GOTO 2110
2095 LOCATE 8,38:PRINT WUD%;"D": GOTO 2110
2100 LOCATE 8,38:PRINT WUD%;"U"
2105 REM-------------------------------------------------
2110 LOCATE 11,30:PRINT"P    ";PW%: LOCATE 13,30:PRINT ";NW%
2115 LET WPN% = PW%-NW%
2120 IF PW%<NW%, THEN WPN%=WPN%*(-1)
2125 IF PW%<NW%, GOTO 2140
2130 IF PW%>NW%, GOTO 2145
2135 LOCATE 12,40:PRINT"00":GOTO 2155
2140 LOCATE 12,38:PRINT WPN%;"N": GOTO 2155
2145 LOCATE 12,38:PRINT WPN%;"P"
2150 REM-------------------------------------------------
2155 LOCATE 15,30:PRINT"F    ";FW%: LOCATE 17,30:PRINT"B    ";BW%
2160 LET WFB% = FW%-BW%
2165 IF FW%<BW%, THEN WFB%=WFB%*(-1)
2170 IF FW%<BW%, GOTO 2185
2175 IF FW%>BW%, GOTO 2190
2180 LOCATE 16,40:PRINT"00":GOTO 2195
2185 LOCATE 16,38:PRINT WFB%;"B": GOTO 2195
2190 LOCATE 16,38:PRINT WFB%;"F"
2195 INPUT"",K$: GOTO 1325
2200 REM-------------------------------------------------
2205 REM INPUT SYMLOG LPC DATA
2210 REM-------------------------------------------------
2215 GOSUB 355
2220 LOCATE 1,70:PRINT"LPC"
2225 PRINT
2230 INPUT"  U ",LU%
2235 INPUT" UP ",LUP%
```

```
2240 INPUT"UPF ",LUPF%
2245 INPUT" UF ",LUF%
2250 INPUT"UNF ",LUNF%
2255 INPUT" UN ",LUN%
2260 INPUT"UNB ",LUNB%
2265 INPUT" UB ",LUB%
2270 INPUT"UPB ",LUPB%
2275 INPUT"  P ",LP%
2280 INPUT" PF ",LPF%
2285 INPUT"  F ",LF%
2290 INPUT" NF ",LNF%
2295 INPUT"  N ",LN%
2300 INPUT" NB ",LNB%
2305 INPUT"  B ",LB%
2310 INPUT" PB ",LPB%
2315 INPUT" DP ",LDP%
2320 INPUT"DPF ",LDPF%
2325 INPUT" DF ",LDF%
2330 INPUT"DNF ",LDNF%
2335 INPUT" DN ",LDN%
2340 INPUT"DNB ",LDNB%
2345 INPUT" DB ",LDB%
2350 INPUT"DPB ",LDPB%
2355 INPUT"  D ",LD%
2360 INPUT"",K$
2365 REM-----------------------------------------------
2370 REM PRINT U,D,P,N,F,B & Totals for SYMLOG LPC
2375 REM-----------------------------------------------
2380 GOSUB 355
2385 GOSUB 2960
2390 LOCATE 3,30:PRINT"TOTALS FOR": LOCATE 4,30:PRINT"SYMLOG LPC"
2395 LOCATE 5,30:PRINT"--------------"
2400 LET UL%=(LU%+LUP%+LUPF%+LUF%+LUNF%+LUN%+LUNB%+LUB%+LUPB%)
2405 LET DL%=(LDP%+LDPF%+LDF%+LDNF%+LDN%+LDNB%+LDB%+LDPB%+LD%)
2410 LET PL%=(LUP%+LUPF%+LUPB%+LP%+LPF%+LPB%+LDP%+LDPF%+LDPB%)
2415 LET NL%=(LUNF%+LUN%+LUNB%+LNF%+LN%+LNB%+LDNF%+LDN%+LDNB%)
2420 LET FL%=(LUPF%+LUF%+LUNF%+LPF%+LF%+LNF%+LDPF%+LDF%+LDNF%)
2425 LET BL%=(LUNB%+LUB%+LUPB%+LNB%+LB%+LPB%+LDNB%+LDB%+LDPB%)
2430 REM-----------------------------------------------
2435 LET LUD% = UL%-DL%
2440 IF UL%<DL%, THEN LUD%=LUD%*(-1)
2445 LOCATE 7,30:PRINT"U    ";UL%: LOCATE 9,30:PRINT"D    ";DL%
2450 IF UL%<DL%, GOTO 2465
2455 IF UL%>DL%, GOTO 2470
2460 LOCATE 8,40:PRINT "00": GOTO 2480
2465 LOCATE 8,38:PRINT LUD%;"D": GOTO 2480
2470 LOCATE 8,38:PRINT LUD%;"U"
2475 REM-----------------------------------------------
2480 LOCATE 11,30:PRINT"P    ";PL%: LOCATE 13,30:PRINT"N    ";NL%
2485 LET LPN% = PL%-NL%
2490 IF PL%<NL%, THEN LPN%=LPN%*(-1)
2495 IF PL%<NL%, GOTO 2510
2500 IF PL%>NL%, GOTO 2515
2505 LOCATE 12,40:PRINT"00":GOTO 2525
2510 LOCATE 12,38:PRINT LPN%;"N": GOTO 2525
2515 LOCATE 12,38:PRINT LPN%;"P"
2520 REM-----------------------------------------------
2525 LOCATE 15,30:PRINT"F    ";FL%: LOCATE 17,30:PRINT"B    ";BL%
```



```
2530 LET LFB% = FL%-BL%
2535 IF FL%<BL%, THEN LFB%=LFB%*(-1)
2540 IF FL%<BL%, GOTO 2555
2545 IF FL%>BL%, GOTO 2560
2550 LOCATE 16,40:PRINT"00":GOTO 2565
2555 LOCATE 16,38:PRINT LFB%;"B": GOTO 2565
2560 LOCATE 16,38:PRINT LFB%;"F"
2565 INPUT"",K$: GOTO 1325
2570 REM-----------------------------------------------
2575 REM INPUT SYMLOG MPC DATA
2580 REM-----------------------------------------------
2585 GOSUB 355
2590 LOCATE 1,70:PRINT"MPC"
2595 PRINT
2600 INPUT"  U ",MU%
2605 INPUT" UP ",MUP%
2610 INPUT"UPF ",MUPF%
2615 INPUT" UF ",MUF%
2620 INPUT"UNF ",MUNF%
2625 INPUT" UN ",MUN%
2630 INPUT"UNB ",MUNB%
2635 INPUT" UB ",MUB%
2640 INPUT"UPB ",MUPB%
2645 INPUT"  P ",MP%
2650 INPUT" PF ",MPF%
2655 INPUT"  F ",MF%
2660 INPUT" NF ",MNF%
2665 INPUT"  N ",MN%
2670 INPUT" NB ",MNB%
2675 INPUT"  B ",MB%
2680 INPUT" PB ",MPB%
2685 INPUT" DP ",MDP%
2690 INPUT"DPF ",MDPF%
2695 INPUT" DF ",MDF%
2700 INPUT"DNF ",MDNF%
2705 INPUT" DN ",MDN%
2710 INPUT"DNB ",MDNB%
2715 INPUT" DB ",MDB%
2720 INPUT"DPB ",MDPB%
2725 INPUT"  D ",MD%
2730 INPUT"",K$
2735 REM-----------------------------------------------
2740 REM PRINT U,D,P,N,F,B & Totals for SYMLOG MPC
2745 REM-----------------------------------------------
2750 GOSUB 355
2755 GOSUB 2960
2760 LOCATE 3,30:PRINT"TOTALS FOR": LOCATE 4,30:PRINT"SYMLOG MPC"
2765 LOCATE 5,30:PRINT"--------------"
2770 LET UM%=(MU%+MUP%+MUPF%+MUF%+MUNF%+MUN%+MUNB%+MUB%+MUPB%)
2775 LET DM%=(MDP%+MDPF%+MDF%+MDNF%+MDN%+MDNB%+MDB%+MDPB%+MD%)
2780 LET PM%=(MUP%+MUPF%+MUPB%+MP%+MPF%+MPB%+MDP%+MDPF%+MDPB%)
2785 LET NM%=(MUNF%+MUN%+MUNB%+MNF%+MN%+MNB%+MDNF%+MDN%+MDNB%)
2790 LET FM%=(MUPF%+MUF%+MUNF%+MPF%+MF%+MNF%+MDPF%+MDF%+MDNF%)
2795 LET BM%=(MUNB%+MUB%+MUPB%+MNB%+MB%+MPB%+MDNB%+MDB%+MDPB%)
2800 REM-----------------------------------------------
2805 LET MUD% = UM%-DM%
2810 IF UM%<DM%, THEN MUD%=MUD%*(-1)
2815 LOCATE 7,30:PRINT"U    ";UM%: LOCATE 9,30:PRINT"D    ";DM%
```

```
2820 IF UM%<DM%, GOTO 2835
2825 IF UM%>DM%, GOTO 2840
2830 LOCATE 8,40:PRINT "00": GOTO 2850
2835 LOCATE 8,38:PRINT MUD%;"D": GOTO 2850
2840 LOCATE 8,38:PRINT MUD%;"U"
2845 REM------------------------------------------------
2850 LOCATE 11,30:PRINT"P    ";PM%: LOCATE 13,30:PRINT"N    ";NM%
2855 LET MPN% = PM%-NM%
2860 IF PM%<NM%, THEN MPN%=MPN%*(-1)
2865 IF PM%<NM%, GOTO 2880
2870 IF PM%>NM%, GOTO 2885
2875 LOCATE 12,40:PRINT"00":GOTO 2890
2880 LOCATE 12,38:PRINT MPN%;"N": GOTO 2890
2885 LOCATE 12,38:PRINT MPN%;"P"
2890 REM------------------------------------------------
2895 LOCATE 15,30:PRINT"F    ";FM%: LOCATE 17,30:PRINT"B    ";BM%
2900 LET MFB% = FM%-BM%
2905 IF FM%<BM%, THEN MFB%=MFB%*(-1)
2910 IF FM%<BM%, GOTO 2925
2915 IF FM%>BM%, GOTO 2930
2920 LOCATE 16,40:PRINT"00":GOTO 2935
2925 LOCATE 16,38:PRINT MFB%;"B": GOTO 2935
2930 LOCATE 16,38:PRINT MFB%;"F"
2935 INPUT"",K$: GOTO 1325
2940 REM------------------------------------------------
2945 REM SUBROUTINE: PRINT SOME LINES
2950 REM------------------------------------------------
2955 GOTO 2980
2960 LOCATE 10,30:PRINT"--------------"
2965 LOCATE 14,30:PRINT"--------------"
2970 LOCATE 18,30:PRINT"--------------"
2975 RETURN
2980 GOSUB 2960
2985 REM------------------------------------------------
2990 REM LPC
2995 REM------------------------------------------------
3000 IF PORT$="Y" GOTO 3035
3005 CLS:LOCATE 11,25:INPUT"Warwick Q (1) or SGQ (2)?",DOOR$
3010 IF DOOR$="1" THEN LOCATE 14,25:PRINT"You have selected
     Warwick Q":GOTO 3025
3015 IF DOOR$="2" THEN LOCATE 14,25:PRINT"You have selected SGQ"
     :GOTO 3025
3020 BEEP:GOTO 3000
3025 LOCATE 16,25:INPUT"IS THIS CORRECT? (Y/N) ",K$
3030 IF K$="N" GOTO 3000
3035 CLS
3040 GOSUB 355
3045 LOCATE 1,60:PRINT"LPC"
3050 PRINT
3055 INPUT"   EFFICIENT  ",A8: IF A8>99 THEN A8=99
3060 INPUT"  UNPLEASANT  ",B8: IF B8>99 THEN B8=99
3065 INPUT"     HELPFUL  ",C8: IF C8>99 THEN C8=99
3070 INPUT"  PRODUCTIVE  ",D8: IF D8>99 THEN D8=99
3075 INPUT"  UNFRIENDLY  ",E8: IF E8>99 THEN E8=99
3080 INPUT" CONSIDERATE  ",F8: IF F8>99 THEN F8=99
3085 INPUT" ADVENTUROUS  ",G8: IF G8>99 THEN G8=99
3090 INPUT"        COLD  ",H8: IF H8>99 THEN H8=99
3095 INPUT"   RELIABLE  ",I8: IF I8>99 THEN I8=99
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```
3100 INPUT"   AMBITIOUS  ",J8: IF J8>99 THEN J8=99
3105 INPUT"     GLOOMY  ",K8: IF K8>99 THEN K8=99
3110 INPUT"      CLOSE  ",L8: IF L8>99 THEN L8=99
3115 INPUT"ENTERPRISING  ",M8: IF M8>99 THEN M8=99
3120 INPUT"    CARELESS  ",N8: IF N8>99 THEN N8=99
3125 INPUT"       OPEN  ",O8: IF O8>99 THEN O8=99
3130 INPUT" INTERESTING  ",P8: IF P8>99 THEN P8=99
3135 IF DOOR$="2" GOTO 3220
3140 LET A8=FND(A8): LOCATE 3,20:PRINT A8
3145 LET B8=FND(B8): LOCATE 4,20:PRINT B8
3150 LET C8=FND(C8): LOCATE 5,20:PRINT C8
3155 LET D8=FND(D8): LOCATE 6,20:PRINT D8
3160 LET E8=FND(E8): LOCATE 7,20:PRINT E8
3165 LET F8=FND(F8): LOCATE 8,20:PRINT F8
3170 LET G8=FND(G8): LOCATE 9,20:PRINT G8
3175 LET H8=FND(H8): LOCATE 10,20:PRINT H8
3180 LET I8=FND(I8): LOCATE 11,20:PRINT I8
3185 LET J8=FND(J8): LOCATE 12,20:PRINT J8
3190 LET K8=FND(K8): LOCATE 13,20:PRINT K8
3195 LET L8=FND(L8): LOCATE 14,20:PRINT L8
3200 LET M8=FND(M8): LOCATE 15,20:PRINT M8
3205 LET N8=FND(N8): LOCATE 16,20:PRINT N8
3210 LET O8=FND(O8): LOCATE 17,20:PRINT O8
3215 LET P8=FND(P8): LOCATE 18,20:PRINT P8
3220 INPUT"",K$
3225 CLS:LOCATE 11,18:INPUT"ARE LPC RAW SCORES ENTERED
     CORRECTLY?(Y/N)",CHOICE$
3230 IF CHOICE$="N", GOTO 3035
3235 LET LPC = (A8+B8+C8+D8+E8+F8+G8+H8+I8+J8+K8+L8+M8+N8+O8+P8)
3240 CLS
3245 REM------------------------------------------------
3250 REM MPC
3255 REM------------------------------------------------
3260 GOSUB 355
3265 LOCATE 1,60:PRINT"MPC"
3270 PRINT
3275 INPUT"   EFFICIENT  ",A9: IF A9>99 THEN A9=99
3280 INPUT"  UNPLEASANT  ",B9: IF B9>99 THEN B9=99
3285 INPUT"     HELPFUL  ",C9: IF C9>99 THEN C9=99
3290 INPUT"  PRODUCTIVE  ",D9: IF D9>99 THEN D9=99
3295 INPUT"  UNFRIENDLY  ",E9: IF E9>99 THEN E9=99
3300 INPUT" CONSIDERATE  ",F9: IF F9>99 THEN F9=99
3305 INPUT" ADVENTUROUS  ",G9: IF G9>99 THEN G9=99
3310 INPUT"        COLD  ",H9: IF H9>99 THEN H9=99
3315 INPUT"    RELIABLE  ",I9: IF I9>99 THEN I9=99
3320 INPUT"   AMBITIOUS  ",J9: IF J9>99 THEN J9=99
3325 INPUT"     GLOOMY  ",K9: IF K9>99 THEN K9=99
3330 INPUT"      CLOSE  ",L9: IF L9>99 THEN L9=99
3335 INPUT"ENTERPRISING  ",M9: IF M9>99 THEN M9=99
3340 INPUT"    CARELESS  ",N9: IF N9>99 THEN N9=99
3345 INPUT"       OPEN  ",O9: IF O9>99 THEN O9=99
3350 INPUT" INTERESTING  ",P9: IF P9>99 THEN P9=99
3355 IF DOOR$="2" GOTO 3440
3360 LET A9=FND(A9): LOCATE 3,20:PRINT A9
3365 LET B9=FND(B9): LOCATE 4,20:PRINT B9
3370 LET C9=FND(C9): LOCATE 5,20:PRINT C9
3375 LET D9=FND(D9): LOCATE 6,20:PRINT D9
3380 LET E9=FND(E9): LOCATE 7,20:PRINT E9
```

```
3385 LET F9=FND(F9): LOCATE 8,20:PRINT F9
3390 LET G9=FND(G9): LOCATE 9,20:PRINT G9
3395 LET H9=FND(H9): LOCATE 10,20:PRINT H9
3400 LET I9=FND(I9): LOCATE 11,20:PRINT I9
3405 LET J9=FND(J9): LOCATE 12,20:PRINT J9
3410 LET K9=FND(K9): LOCATE 13,20:PRINT K9
3415 LET L9=FND(L9): LOCATE 14,20:PRINT L9
3420 LET M9=FND(M9): LOCATE 15,20:PRINT M9
3425 LET N9=FND(N9): LOCATE 16,20:PRINT N9
3430 LET O9=FND(O9): LOCATE 17,20:PRINT O9
3435 LET P9=FND(P9): LOCATE 18,20:PRINT P9
3440 INPUT"",K$
3445 CLS: LOCATE 11,18:INPUT"ARE MPC RAW SCORES ENTERED
     CORRECTLY?(Y/N)",CHOICE$
3450 IF CHOICE$="N", GOTO 3250
3455 LET MPC = (A9+B9+C9+D9+E9+F9+G9+H9+I9+J9+K9+L9+M9+N9+O9+P9)
3460 CLS
3465 REM-------------------------------------------------
3470 REM CALCULATE ASO; ASO(T); ASO(S) ...
3475 REM-------------------------------------------------
3480 LET A = (A8-A9)^2: LET B = (B8-B9)^2: LET C = (C8-C9)^2: LET
       P = (P8-P9)^2
3485 LET D = (D8-D9)^2: LET E = (E8-E9)^2: LET F = (F8-F9)^2: LET
       G = (G8-G9)^2
3490 LET H = (H8-H9)^2: LET I = (I8-I9)^2: LET J = (J8-J9)^2: LET
       K = (K8-K9)^2
3495 LET L = (L8-L9)^2: LET M = (M8-M9)^2: LET N = (N8-N9)^2: LET
       O = (O8-O9)^2
3500 LET ASO = SQR(A+B+C+D+E+F+G+H+I+J+K+L+M+N+O+P)
3505 REM-------------------------------------------------
3510 LET LPCT = (A8+C8+D8+G8+I8+J8+M8+N8)
3515 LET LPCS = (B8+E8+F8+H8+K8+L8+O8+P8)
3520 LET MPCT = (A9+C9+D9+G9+I9+J9+M9+N9)
3525 LET MPCS = (B9+E9+F9+H9+K9+L9+O9+P9)
3530 REM-------------------------------------------------
3535 LET ASOT = SQR((A8-A9)^2+(C8-C9)^2+(D8-D9)^2+(G8-G9)^2+ (I8-
       I9)^2+(J8-J9)^2+(M8-M9)^2+(N8-N9)^2)
3540   LET ASOS = SQR((B8-B9)^2+(E8-E9)^2+(F8-F9)^2+(H8-H9)^2+(K8-
       K9)^2+(L8-L9)^2+(O8-O9)^2+(P8-P9)^2)
3545 REM-------------------------------------------------
3550 GOSUB 355
3555 LOCATE 3,1:PRINT"ASO Totals:"
3560 IF LPCT<27, GOTO 3575
3565 IF LPCT>45, GOTO 3580
3570 LOCATE 4,6:PRINT"LPC(T)";LPCT;"[M]": GOTO 3585
3575 LOCATE 4,6:PRINT"LPC(T)";LPCT;"[L]": GOTO 3585
3580 LOCATE 4,6:PRINT"LPC(T)";LPCT;"[H]"
3585 REM-------------------------------------------------
3590 IF MPCT<27, GOTO 3605
3595 IF MPCT>45, GOTO 3610
3600 LOCATE 4,25:PRINT"MPC(T)";MPCT;"[M]": GOTO 3615
3605 LOCATE 4,25:PRINT"MPC(T)";MPCT;"[L]": GOTO 3615
3610 LOCATE 4,25:PRINT"MPC(T)";MPCT;"[H]"
3615 REM-------------------------------------------------
3620 IF ASOT<7.542, GOTO 3635
3625 IF ASOT>15.0857, GOTO 3640
3630 LOCATE 4,44:PRINT"ASO(T)";ASOT;"[M]": GOTO 3645
3635 LOCATE 4,44:PRINT"ASO(T)";ASOT;"[L]": GOTO 3645
```



```
3640 LOCATE 4,44:PRINT"ASO(T)";ASOT;"[H]"
3645 REM-------------------------------------------------
3650 IF LPCS<27, GOTO 3665
3655 IF LPCS>45, GOTO 3670
3660 LOCATE 5,6:PRINT"LPC(S)";LPCS;"[M]": GOTO 3675
3665 LOCATE 5,6:PRINT"LPC(S)";LPCS;"[L]": GOTO 3675
3670 LOCATE 5,6:PRINT"LPC(S)";LPCS;"[H]"
3675 REM-------------------------------------------------
3680 IF MPCS<27, GOTO 3695
3685 IF MPCS>45, GOTO 3700
3690 LOCATE 5,25:PRINT"MPC(S)";MPCS;"[M]": GOTO 3705
3695 LOCATE 5,25:PRINT"MPC(S)";MPCS;"[L]": GOTO 3705
3700 LOCATE 5,25:PRINT"MPC(S)";MPCS;"[H]"
3705 REM-------------------------------------------------
3710 IF ASOS<7.542, GOTO 3725
3715 IF ASOS>15.0857, GOTO 3730
3720 LOCATE 5,44:PRINT"ASO(S)";ASOS;"[M]": GOTO 3735
3725 LOCATE 5,44:PRINT"ASO(S)";ASOS;"[L]": GOTO 3735
3730 LOCATE 5,44:PRINT"ASO(S)";ASOS;"[H]"
3735 LOCATE 6,1:PRINT"-------------------------------------
     ----------------------------------------"
3740 IF LPC<54, GOTO 3755
3745 IF LPC>90, GOTO 3760
3750 LOCATE 7,6:PRINT"LPC";LPC;"[M]": GOTO 3765
3755 LOCATE 7,6:PRINT"LPC";LPC;"[L]": GOTO 3765
3760 LOCATE 7,6:PRINT"LPC";LPC;"[H]"
3765 REM-------------------------------------------------
3770 IF MPC<54, GOTO 3785
3775 IF MPC>90, GOTO 3790
3780 LOCATE 7,25:PRINT"MPC";MPC;"[M]": GOTO 3795
3785 LOCATE 7,25:PRINT"MPC";MPC;"[L]": GOTO 3795
3790 LOCATE 7,25:PRINT"MPC";MPC;"[H]"
3795 REM-------------------------------------------------
3800 IF ASO<10.668, GOTO 3815
3805 IF ASO>21.334, GOTO 3820
3810 LOCATE 7,44:PRINT"ASO";ASO;"[M]": GOTO 3825
3815 LOCATE 7,44:PRINT"ASO";ASO;"[L]": GOTO 3825
3820 LOCATE 7,44:PRINT"ASO";ASO;"[H]"
3825 INPUT"",K$:GOTO 1200
3830 REM-------------------------------------------------
3835 REM SUBROUTINE: PRINT SYMLOG TOTALS GRID
3840 REM-------------------------------------------------
3845 GOTO 3905
3850 REM
3855 CLS
3860 GOSUB 355
3865 LOCATE 2,1:PRINT"-----------------------------------
     ----------------------------------------"
3870 LOCATE 3,1:PRINT"SYMLOG"
3875 LOCATE 5,1:PRINT"      SELF        WISH        LPC
     MPC"
3880 LOCATE 6,1:PRINT"   ----------  ----------  ----------
     ----------"
3885 LOCATE 10,1:PRINT"   ----------  ----------  ----------
     ----------"
3890 LOCATE 14,1:PRINT"   ----------  ----------  ----------
     ----------"
3895 LOCATE 19,1:PRINT"-------------------------------
```

```
     ------------------------------------------------"
3900 RETURN
3905 GOSUB 3850
3910 REM-------------------------------------------------
3915 REM SYMLOG SELF: DIRECT INPUT TOTALS
3920 REM-------------------------------------------------
3925 LOCATE 7,1:INPUT"U    ",US%: LOCATE 9,1:INPUT"D    ",DS%
3930 LET SUD% = US%-DS%
3935 IF US%<DS%, THEN SUD%=SUD%*(-1)
3940 GOTO 3975
3945 IF US%<DS%, GOTO 3960
3950 IF US%>DS%, GOTO 3965
3955 LOCATE 8,11:PRINT "00": GOTO 3970
3960 LOCATE 8,9:PRINT SUD%;"D": GOTO 3970
3965 LOCATE 8,9:PRINT SUD%;"U"
3970 RETURN
3975 GOSUB 3945
3980 REM-------------------------------------------------
3985 LOCATE 11,1:INPUT"P    ",PS%: LOCATE 13,1:INPUT"N    ",NS%
3990 LET SPN% = PS%-NS%
3995 IF PS%<NS%, THEN SPN%=SPN%*(-1)
4000 GOTO 4035
4005 IF PS%<NS%, GOTO 4020
4010 IF PS%>NS%, GOTO 4025
4015 LOCATE 12,11:PRINT"00":GOTO 4030
4020 LOCATE 12,9:PRINT SPN%;"N": GOTO 4030
4025 LOCATE 12,9:PRINT SPN%;"P"
4030 RETURN
4035 GOSUB 4005
4040 REM-------------------------------------------------
4045 LOCATE 15,1:INPUT"F    ",FS%: LOCATE 17,1:INPUT"B    ",BS%
4050 LET SFB% = FS%-BS%
4055 IF FS%<BS%, THEN SFB%=SFB%*(-1)
4060 GOTO 4095
4065 IF FS%<BS%, GOTO 4080
4070 IF FS%>BS%, GOTO 4085
4075 LOCATE 16,11:PRINT"00":GOTO 4090
4080 LOCATE 16,9:PRINT SFB%;"B": GOTO 4090
4085 LOCATE 16,9:PRINT SFB%;"F"
4090 RETURN
4095 GOSUB 4065
4100 REM-------------------------------------------------
4105 REM SYMLOG WISH: DIRECT INPUT TOTALS
4110 REM-------------------------------------------------
4115 LOCATE 7,18:INPUT"",UW%: LOCATE 9,18:INPUT"",DW%
4120 LET WUD% = UW%-DW%
4125 IF UW%<DW%, THEN WUD%=WUD%*(-1)
4130 GOTO 4165
4135 IF UW%<DW%, GOTO 4150
4140 IF UW%>DW%, GOTO 4155
4145 LOCATE 8,23:PRINT "00": GOTO 4160
4150 LOCATE 8,21:PRINT WUD%;"D": GOTO 4160
4155 LOCATE 8,21:PRINT WUD%;"U"
4160 RETURN
4165 GOSUB 4135
4170 REM-------------------------------------------------
4175 LOCATE 11,18:INPUT"",PW%: LOCATE 13,18:INPUT"",NW%
4180 LET WPN% = PW%-NW%
```



```
4185 IF PW%<NW%, THEN WPN%=WPN%*(-1)
4190 GOTO 4225
4195 IF PW%<NW%, GOTO 4210
4200 IF PW%>NW%, GOTO 4215
4205 LOCATE 12,23:PRINT"00": GOTO 4220
4210 LOCATE 12,21:PRINT WPN%;"N": GOTO 4220
4215 LOCATE 12,21:PRINT WPN%;"P"
4220 RETURN
4225 GOSUB 4195
4230 REM-------------------------------------------------
4235 LOCATE 15,18:INPUT"",FW%: LOCATE 17,18:INPUT"",BW%
4240 LET WFB% = FW%-BW%
4245 IF FW%<BW%, THEN WFB%=WFB%*(-1)
4250 GOTO 4290
4255 IF FW%<BW%, GOTO 4270
4260 IF FW%>BW%, GOTO 4280
4265 LOCATE 16,23:PRINT"00": GOTO 4285
4270 LOCATE 16,21:PRINT WFB%;"B":GOTO 4285
4275 INPUT"",K$
4280 LOCATE 16,21:PRINT WFB%;"F"
4285 RETURN
4290 GOSUB 4255
4295 REM-------------------------------------------------
4300 REM SYMLOG LPC: DIRECT INPUT TOTALS
4305 REM-------------------------------------------------
4310 LOCATE 7,30:INPUT"",UL%: LOCATE 9,30:INPUT"",DL%
4315 LET LUD% =UL%-DL%
4320 IF UL%<DL%, THEN LUD%=LUD%*(-1)
4325 GOTO 4360
4330 IF UL%<DL%, GOTO 4345
4335 IF UL%>DL%, GOTO 4350
4340 LOCATE 8,35:PRINT"00": GOTO 4355
4345 LOCATE 8,33:PRINT LUD%;"D": GOTO 4355
4350 LOCATE 8,33:PRINT LUD%;"U"
4355 RETURN
4360 GOSUB 4330
4365 REM-------------------------------------------------
4370 LOCATE 11,30:INPUT"",PL%: LOCATE 13,30:INPUT"",NL%
4375 LET LPN% = PL%-NL%
4380 IF PL%<NL%, THEN LPN%=LPN%*(-1)
4385 GOTO 4420
4390 IF PL%<NL%, GOTO 4405
4395 IF PL%>NL%, GOTO 4410
4400 LOCATE 12,35:PRINT"00": GOTO 4415
4405 LOCATE 12,33:PRINT LPN%;"N": GOTO 4415
4410 LOCATE 12,33:PRINT LPN%;"P"
4415 RETURN
4420 GOSUB 4390
4425 REM-------------------------------------------------
4430 LOCATE 15,30:INPUT"",FL%: LOCATE 17,30:INPUT"",BL%
4435 LET LFB% = FL%-BL%
4440 IF FL%<BL%, THEN LFB%=LFB%*(-1)
4445 GOTO 4480
4450 IF FL%<BL%, GOTO 4465
4455 IF FL%>BL%, GOTO 4470
4460 LOCATE 16,35:PRINT"00": GOTO 4475
4465 LOCATE 16,33:PRINT LFB%;"B": GOTO 4475
4470 LOCATE 16,33:PRINT LFB%;"F"
```

```
4475 RETURN
4480 GOSUB 4450
4485 REM-----------------------------------------------
4490 REM SYMLOG MPC: DIRECT INPUT TOTALS
4495 REM-----------------------------------------------
4500 LOCATE 7,42:INPUT"",UM%: LOCATE 9,42:INPUT"",DM%
4505 LET MUD% = UM%-DM%
4510 IF UM%<DM%, THEN MUD%=MUD%*(-1)
4515 GOTO 4550
4520 IF UM%<DM%, GOTO 4535
4525 IF UM%>DM%, GOTO 4540
4530 LOCATE 8,45:PRINT"00": GOTO 4545
4535 LOCATE 8,45:PRINT MUD%;"D": GOTO 4545
4540 LOCATE 8,45:PRINT MUD%;"U"
4545 RETURN
4550 GOSUB 4520
4555 REM-----------------------------------------------
4560 LOCATE 11,42:INPUT"",PM%: LOCATE 13,42:INPUT"",NM%
4565 LET MPN% = PM%-NM%
4570 IF PM%<NM%, THEN MPN%=MPN%*(-1)
4575 GOTO 4610
4580 IF PM%<NM%, GOTO 4595
4585 IF PM%>NM%, GOTO 4600
4590 LOCATE 12,47:PRINT"00": GOTO 4605
4595 LOCATE 12,45:PRINT MPN%;"N": GOTO 4605
4600 LOCATE 12,45:PRINT MPN%;"P"
4605 RETURN
4610 GOSUB 4580
4615 REM-----------------------------------------------
4620 LOCATE 15,42:INPUT"",FM%: LOCATE 17,42:INPUT"",BM%
4625 LET MFB% = FM%-BM%
4630 IF FM%<BM%, THEN MFB%=MFB%*(-1)
4635 GOTO 4955
4640 IF FM%<BM%, GOTO 4655
4645 IF FM%>BM%, GOTO 4660
4650 LOCATE 16,47:PRINT"00": GOTO 4665
4655 LOCATE 16,45:PRINT MFB%;"B": GOTO 4665
4660 LOCATE 16,45:PRINT MFB%;"F"
4665 GOSUB 5150
4670 REM-----------------------------------------------
4675 LOCATE 20,1:PRINT"ASO:"
4680 IF LPCT<27, GOTO 4695
4685 IF LPCT>45, GOTO 4700
4690 LOCATE 20,6:PRINT"LPC(T) = ";LPCT;"[M];": GOTO 4705
4695 LOCATE 20,6:PRINT"LPC(T) = ";LPCT;"[L];": GOTO 4705
4700 LOCATE 20,6:PRINT"LPC(T) = ";LPCT;"[H];"
4705 REM-----------------------------------------------
4710 IF MPCT<27, GOTO 4725
4715 IF MPCT>45, GOTO 4730
4720 LOCATE 20,30:PRINT"MPC(T) = ";MPCT;"[M];": GOTO 4735
4725 LOCATE 20,30:PRINT"MPC(T) = ";MPCT;"[L];": GOTO 4735
4730 LOCATE 20,30:PRINT"MPC(T) = ";MPCT;"[H];"
4735 REM-----------------------------------------------
4740 IF ASOT<7.542, GOTO 4755
4745 IF ASOT>15.0857, GOTO 4760
4750 LOCATE 20,54:PRINT"ASO(T) = ";ASOT;"[M]": GOTO 4765
4755 LOCATE 20,54:PRINT"ASO(T) = ";ASOT;"[L]": GOTO 4765
4760 LOCATE 20,54:PRINT"ASO(T) = ";ASOT;"[H]"
```



```
4765 REM-----------------------------------------------
4770 IF LPCS<27, GOTO 4785
4775 IF LPCS>45, GOTO 4790
4780 LOCATE 21,6:PRINT"LPC(S) = ";LPCS;"[M];": GOTO 4795
4785 LOCATE 21,6:PRINT"LPC(S) = ";LPCS;"[L];": GOTO 4795
4790 LOCATE 21,6:PRINT"LPC(S) = ";LPCS;"[H];"
4795 REM-----------------------------------------------
4800 IF MPCS<27, GOTO 4815
4805 IF MPCS>45, GOTO 4820
4810 LOCATE 21,30:PRINT"MPC(S) = ";MPCS;"[M];": GOTO 4825
4815 LOCATE 21,30:PRINT"MPC(S) = ";MPCS;"[L];": GOTO 4825
4820 LOCATE 21,30:PRINT"MPC(S) = ";MPCS;"[H];"
4825 REM-----------------------------------------------
4830 IF ASOS<7.542, GOTO 4845
4835 IF ASOS>15.0857, GOTO 4850
4840 LOCATE 21,54:PRINT"ASO(S) = ";ASOS;"[M]": GOTO 4855
4845 LOCATE 21,54:PRINT"ASO(S) = ";ASOS;"[L]": GOTO 4855
4850 LOCATE 21,54:PRINT"ASO(S) = ";ASOS;"[H]"
4855 REM-----------------------------------------------
4860 IF LPC<54, GOTO 4875
4865 IF LPC>90, GOTO 4880
4870 LOCATE 22,6:PRINT"LPC    = ";LPC;"[M];": GOTO 4885
4875 LOCATE 22,6:PRINT"LPC    = ";LPC;"[L];": GOTO 4885
4880 LOCATE 22,6:PRINT"LPC    = ";LPC;"[H];"
4885 REM-----------------------------------------------
4890 IF MPC<54, GOTO 4905
4895 IF MPC>90, GOTO 4910
4900 LOCATE 22,30:PRINT"MPC    = ";MPC;"[M];": GOTO 4915
4905 LOCATE 22,30:PRINT"MPC    = ";MPC;"[L];": GOTO 4915
4910 LOCATE 22,30:PRINT"MPC    = ";MPC;"[H];"
4915 REM-----------------------------------------------
4920 IF ASO<10.668, GOTO 4935
4925 IF ASO>21.334, GOTO 4940
4930 LOCATE 22,54:PRINT"ASO    = ";ASO;"[M]": GOTO 4945
4935 LOCATE 22,54:PRINT"ASO    = ";ASO;"[L]": GOTO 4945
4940 LOCATE 22,54:PRINT"ASO    = ";ASO;"[H]"
4945 LOCATE 23,1:PRINT"-----------------------------------
     -----------------------------------------------"
4950 RETURN
4955 GOSUB 4640
4960 INPUT"",K$:GOTO 1325
4965 REM-----------------------------------------------
4970 REM DISPLAY SYMLOG & ASO TOTALS
4975 REM-----------------------------------------------
4980 GOSUB 3850
4985 LOCATE 7,1:PRINT"U": LOCATE 9,1:PRINT"D"
4990 LOCATE 7,6:PRINT US%: LOCATE 9,6:PRINT DS%
4995 GOSUB 3945
5000 LOCATE 13,1:PRINT"N"
5005 LOCATE 11,1:PRINT"P"
5010 LOCATE 11,6:PRINT PS%: LOCATE 13,6:PRINT NS%
5015 GOSUB 4005
5020 LOCATE 15,1:PRINT"F": LOCATE 17,1:PRINT"B"
5025 LOCATE 15,6:PRINT FS%: LOCATE 17,6:PRINT BS%
5030 GOSUB 4065
5035 LOCATE 7,18:PRINT UW%: LOCATE 9,18:PRINT DW%
5040 GOSUB 4135
5045 LOCATE 13,18:PRINT NW%
```

```
5050 LOCATE 11,18:PRINT PW%
5055 GOSUB 4195
5060 LOCATE 15,18:PRINT FW%: LOCATE 17,18:PRINT BW%
5065 GOSUB 4255
5070 LOCATE 7,30:PRINT UL%: LOCATE 9,30:PRINT DL%
5075 GOSUB 4330
5080 LOCATE 11,30:PRINT PL%: LOCATE 13,30:PRINT NL%
5085 GOSUB 4390
5090 LOCATE 15,30:PRINT FL%: LOCATE 17,30:PRINT BL%
5095 GOSUB 4450
5100 LOCATE 7,42:PRINT UM%: LOCATE 9,42:PRINT DM%
5105 GOSUB 4520
5110 LOCATE 11,42:PRINT PM%: LOCATE 13,42:PRINT NM%
5115 GOSUB 4580
5120 LOCATE 15,42:PRINT FM%: LOCATE 17,42:PRINT BM%
5125 GOSUB 4640
5130 REM-------------------------------------------------------------
5135 REM CALCULATE AND PRINT GRAPH DISTANCE MEASURES & CRONBACH'S
     D (SYMLOG)
5140 REM-------------------------------------------------------------
5145 GOTO 5455
5150 LET ASUD% = US%-DS%
5155 LET ASPN% = PS%-NS%
5160 LET ASFB% = FS%-BS%
5165 REM-----------------------------------------------
5170 LET AWUD% = UW%-DW%
5175 LET AWPN% = PW%-NW%
5180 LET AWFB% = FW%-BW%
5185 REM-----------------------------------------------
5190 LET ALUD% = UL%-DL%
5195 LET ALPN% = PL%-NL%
5200 LET ALFB% = FL%-BL%
5205 REM-----------------------------------------------
5210 LET AMUD% = UM%-DM%
5215 LET AMPN% = PM%-NM%
5220 LET AMFB% = FM%-BM%
5225 REM-----------------------------------------------
5230 LET GSW = SQR((ASUD%-AWUD%)^2+(ASPN%-AWPN%)^2+(ASFB%-
     AWFB%)^2)
5235 LET GLM = SQR((ALUD%-AMUD%)^2+(ALPN%-AMPN%)^2+(ALFB%-
     AMFB%)^2)
5240 LET GSL = SQR((ASUD%-ALUD%)^2+(ASPN%-ALPN%)^2+(ASFB%-
     ALFB%)^2)
5245 LET GSM = SQR((ASUD%-AMUD%)^2+(ASPN%-AMPN%)^2+(ASFB%-
     AMFB%)^2)
5250 LET GWL = SQR((AWUD%-ALUD%)^2+(AWPN%-ALPN%)^2+(AWFB%-
     ALFB%)^2)
5255 LET GWM = SQR((AWUD%-AMUD%)^2+(AWPN%-AMPN%)^2+(AWFB%-
     AMFB%)^2)
5260 REM-----------------------------------------------
5265 LOCATE 3,53:PRINT"Graph Distances:"
5270 LOCATE 4,53:PRINT"Self/Wish = ";GSW
5275 LOCATE 5,53:PRINT"LPC/MPC   = ";GLM
5280 LOCATE 6,53:PRINT"--------------------"
5285 LOCATE 7,53:PRINT"Self/LPC  = ";GSL
5290 LOCATE 8,53:PRINT"Self/MPC  = ";GSM
5295 LOCATE 9,53:PRINT"Wish/LPC  = ";GWL
5300 LOCATE 10,53:PRINT"Wish/MPC  = ";GWM
```



```
5305 LOCATE 11,53:PRINT"--------------------------"
5310 REM-----------------------------------------------
5315 REM CRONBACH'S D for SYMLOG Scores
5320 REM-----------------------------------------------
5325 LET CSW1 = ((SU%-WU%)^2+(SUP%-WUP%)^2+(SUPF%-WUPF%)^2+(SUF%-
     WUF%)^2+(SUNF%-WUNF%)^2+(SUN%-WUN%)^2+(SUNB%-
     WUNB%)^2+(SUB%-WUB%)^2+(SUPB%-WUPB%)^2+(SP%-WP%)^2+(SPF%-
     WPF%)^2+(SF%-WF%)^2+(SNF%-WNF%)^2)
5330 LET CSW2 = ((SN%-WN%)^2+(SNB%-WNB%)^2+(SB%-WB%)^2+(SPB%-
     WPB%)^2+(SDP%-WDP%)^2+(SDPF%-WDPF%)^2+(SDF%-WDF%)^2+(SDNF%-
     WDNF%)^2+(SDN%-WDN%)^2+(SDNB%-WDNB%)^2+(SDB%-
     WDB%)^2+(SDPB%-WDPB%)^2+(SD%-WD%)^2)
5335 LET CDSW = SQR(CSW1+CSW2)
5340 LET CLM1 = ((LU%-MU%)^2+(LUP%-MUP%)^2+(LUPF%-MUPF%)^2+(LUF%-
     MUF%)^2+(LUNF%-MUNF%)^2+(LUN%-MUN%)^2+(LUNB%-
     MUNB%)^2+(LUB%-MUB%)^2+(LUPB%-MUPB%)^2+(LP%-MP%)^2+(LPF%-
     MPF%)^2+(LF%-MF%)^2+(LNF%-MNF%)^2)
5345 LET CLM2 = ((LN%-MN%)^2+(LNB%-MNB%)^2+(LB%-MB%)^2+(LPB%-
     MPB%)^2+(LDP%-MDP%)^2+(LDPF%-MDPF%)^2+(LDF%-MDF%)^2+(LDNF%-
     MDNF%)^2+(LDN%-MDN%)^2+(LDNB%-MDNB%)^2+(LDB%-
     MDB%)^2+(LDPB%-MDPB%)^2+(LD%-MD%)^2)
5350 LET CDLM = SQR(CLM1+CLM2)
5355 LET CSL1 = ((SU%-LU%)^2+(SUP%-LUP%)^2+(SUPF%-LUPF%)^2+(SUF%-
     LUF%)^2+(SUNF%-LUNF%)^2+(SUN%-LUN%)^2+(SUNB%-
     LUNB%)^2+(SUB%-LUB%)^2+(SUPB%-LUPB%)^2+(SP%-LP%)^2+(SPF%-
     LPF%)^2+(SF%-LF%)^2+(SNF%-LNF%)^2+(SN%-LN%)^2)
5360 LET CSL2 = ((SNB%-LNB%)^2+(SB%-LB%)^2+(SPB%-LPB%)^2+(SDP%-
     LDP%)^2+(SDPF%-LDPF%)^2+(SDF%-LDF%)^2+(SDNF%-
     LDNF%)^2+(SDN%-LDN%)^2+(SDNB%-LDNB%)^2+(SDB%-
     LDB%)^2+(SDPB%-LDPB%)^2+(SD%-LD%)^2)
5365 LET CDSL = SQR(CSL1+CSL2)
5370 LET CSM1 = ((SU%-MU%)^2+(SUP%-MUP%)^2+(SUPF%-MUPF%)^2+(SUF%-
     MUF%)^2+(SUNF%-MUNF%)^2+(SUN%-MUN%)^2+(SUNB%-
     MUNB%)^2+(SUB%-MUB%)^2+(SUPB%-MUPB%)^2+(SP%-MP%)^2+(SPF%-
     MPF%)^2+(SF%-MF%)^2+(SNF%-MNF%)^2+(SN%-MN%)^2)
5375 LET CSM2 = ((SNB%-MNB%)^2+(SB%-MB%)^2+(SPB%-MPB%)^2+(SDP%-
     MDP%)^2+(SDPF%-MDPF%)^2+(SDF%-MDF%)^2+(SDNF%-
     MDNF%)^2+(SDN%-MDN%)^2+(SDNB%-MDNB%)^2+(SDB%-
     MDB%)^2+(SDPB%-MDPB%)^2+(SD%-MD%)^2)
5380 LET CDSM = SQR(CSM1+CSM2)
5385 LET CWL1 = ((WU%-LU%)^2+(WUP%-LUP%)^2+(WUPF%-LUPF%)^2+(WUF%-
     LUF%)^2+(WUNF%-LUNF%)^2+(WUN%-LUN%)^2+(WUNB%-
     LUNB%)^2+(WUB%-LUB%)^2+(WUPB%-LUPB%)^2+(WP%-LP%)^2+(WPF%-
     LPF%)^2+(WF%-LF%)^2+(WNF%-LNF%)^2+(WN%-LN%)^2)
5390 LET CWL2 = ((WNB%-LNB%)^2+(WB%-LB%)^2+(WPB%-LPB%)^2+(WDP%-
     LDP%)^2+(WDPF%-LDPF%)^2+(WDF%-LDF%)^2+(WDNF%-
     LDNF%)^2+(WDN%-LDN%)^2+(WDNB%-LDNB%)^2+(WDB%-
     LDB%)^2+(WDPB%-LDPB%)^2+(WD%-LD%)^2)
5395 LET CDWL = SQR(CWL1+CWL2)
5400 LET CWM1 = ((WU%-MU%)^2+(WUP%-MUP%)^2+(WUPF%-MUPF%)^2+(WUF%-
     MUF%)^2+(WUNF%-MUNF%)^2+(WUN%-MUN%)^2+(WUNB%-
     MUNB%)^2+(WUB%-MUB%)^2+(WUPB%-MUPB%)^2+(WP%-MP%)^2+(WPF%-
     MPF%)^2+(WF%-MF%)^2+(WNF%-MNF%)^2+(WN%-MN%)^2)
5405 LET CWM2 = ((WNB%-MNB%)^2+(WB%-MB%)^2+(WPB%-MPB%)^2+(WDP%-
     MDP%)^2+(WDPF%-MDPF%)^2+(WDF%-MDF%)^2+(WDNF%-
     MDNF%)^2+(WDN%-MDN%)^2+(WDNB%-MDNB%)^2+(WDB%-
     MDB%)^2+(WDPB%-MDPB%)^2+(WD%-MD%)^2)
5410 LET CDWM = SQR(CWM1+CWM2)
```

```
5415 LOCATE 12,53:PRINT"Cronbach's D:"
5420 LOCATE 13,53:PRINT"Self/Wish     = ";CDSW
5425 LOCATE 14,53:PRINT"LPC/MPC (ASO)= ";CDLM
5430 LOCATE 15,53:PRINT"Self/LPC      = ";CDSL
5435 LOCATE 16,53:PRINT"Self/MPC      = ";CDSM
5440 LOCATE 17,53:PRINT"Wish/LPC      = ";CDWL
5445 LOCATE 18,53:PRINT"Wish/MPC      = ";CDWM
5450 RETURN
5455 GOSUB 5150
5460 INPUT"",K$: GOTO 1200
5465 REM-----------------------------------------------
5470 REM RE-INPUT BELBIN'S SPI BY ROW
5475 REM-----------------------------------------------
5480 CLS
5485 GOSUB 6030
5490 LOCATE 20,15:PRINT"                                "
5495 LOCATE 20,15:INPUT"     ALTER WHICH ROW?",CHOICE$
5500 IF CHOICE$="1" THEN GOSUB 5695
5505 IF CHOICE$="I" THEN GOSUB 5695
5510 IF CHOICE$="2" THEN GOSUB 5730
5515 IF CHOICE$="II" THEN GOSUB 5730
5520 IF CHOICE$="3" THEN GOSUB 5765
5525 IF CHOICE$="III" THEN GOSUB 5765
5530 IF CHOICE$="4" THEN GOSUB 5800
5535 IF CHOICE$="IV" THEN GOSUB 5800
5540 IF CHOICE$="5" THEN GOSUB 5835
5545 IF CHOICE$="V" THEN GOSUB 5835
5550 IF CHOICE$="6" THEN GOSUB 5870
5555 IF CHOICE$="VI" THEN GOSUB 5870
5560 IF CHOICE$="7" THEN GOSUB 5905
5565 IF CHOICE$="VII" THEN GOSUB 5905
5570 IF CHOICE$="ALL" GOTO 5610
5575 LOCATE 20,15:PRINT"                                "
5580 LOCATE 20,15:INPUT"ALTER ANOTHER LINE? (Y/N)",CHOICE$
5585 IF CHOICE$="N" THEN LOCATE 20,15:PRINT"            "
5590 IF CHOICE$="N" THEN GOTO 6000
5595 IF CHOICE$="Y" GOTO 5490
5600 BEEP: GOTO 5580
5605 INPUT"",K$: GOTO 1200
5610 REM-----------------------------------------------
5615 REM INPUT BELBIN'S SPI
5620 REM-----------------------------------------------
5625 GOTO 5685
5630 CLS
5635 GOSUB 355
5640 LOCATE 3,1:PRINT"BELBIN'S TEAM ROLE PERCEPTION INVENTORY"
5645 LOCATE 4,1:PRINT"-----------------------------------
     -----------------------------------------"
5650 LOCATE 5,10:PRINT"CW    CH    SH    PL    RI    ME    TW
     CF"
5655 LOCATE 6,1:PRINT "-----------------------------------
     -----------------------------------------"
5660 LOCATE 8,5:PRINT"I": LOCATE 9,4:PRINT"II": LOCATE 10,3:
     PRINT"III"
5665 LOCATE 11,4:PRINT"IV": LOCATE 12,5:PRINT"V": LOCATE 13,4:
     PRINT"VI"
5670 LOCATE 14,3:PRINT"VII": LOCATE 16,1:PRINT"TOTAL"
```



```
5675 LOCATE 15,1:PRINT"-----------------------------------
     -----------------------"
5680 RETURN
5685 GOSUB 5630
5690 GOTO 5720
5695 LOCATE 8,34:INPUT"",A1: LOCATE 8,46:INPUT"",B1: LOCATE 8,28:
     INPUT"",C1
5700 LOCATE 8,16:INPUT"",D1: LOCATE 8,52:INPUT"",E1: LOCATE 8,22:
     INPUT"",F1
5705 LOCATE 8,10:INPUT"",G1: LOCATE 8,40:INPUT"",H1
5710 IF (A1+B1+C1+D1+E1+F1+G1+H1)<>10, THEN BEEP: GOTO 5695
5715 RETURN
5720 GOSUB 5695
5725 GOTO 5755
5730 LOCATE 9,10:INPUT"",A2: LOCATE 9,16:INPUT"",B2: LOCATE 9,34:
     INPUT"",C2
5735 LOCATE 9,40:INPUT"",D2: LOCATE 9,22:INPUT"",E2: LOCATE 9,46:
     INPUT"",F2
5740 LOCATE 9,28:INPUT"",G2: LOCATE 9,52:INPUT"",H2
5745 IF (A2+B2+C2+D2+E2+F2+G2+H2)<>10, THEN BEEP: GOTO 5730
5750 RETURN
5755 GOSUB 5730
5760 GOTO 5790
5765 LOCATE 10,16:INPUT"",A3: LOCATE 10,52:INPUT"",B3: LOCATE
     10,22: INPUT"",C3
5770 LOCATE 10,28:INPUT"",D3: LOCATE 10,46:INPUT"",E3: LOCATE
     10,34: INPUT"",F3
5775 LOCATE 10,40:INPUT"",G3: LOCATE 10,10:INPUT"",H3
5780 IF (A3+B3+C3+D3+E3+F3+G3+H3)<>10, THEN BEEP: GOTO 5765
5785 RETURN
5790 GOSUB 5765
5795 GOTO 5825
5800 LOCATE 11,46:INPUT"",A4: LOCATE 11,22:INPUT"",B4: LOCATE
     11,40: INPUT"",C4
5805 LOCATE 11,10:INPUT"",D4: LOCATE 11,28:INPUT"",E4: LOCATE
     11,52: INPUT"",F4
5810 LOCATE 11,34:INPUT"",G4: LOCATE 11,16:INPUT"",H4
5815 IF (A4+B4+C4+D4+E4+F4+G4+H4)<>10, THEN BEEP: GOTO 5800
5820 RETURN
5825 GOSUB 5800
5830 GOTO 5860
5835 LOCATE 12,40:INPUT"",A5: LOCATE 12,10:INPUT"",B5: LOCATE
     12,46: INPUT"",C5
5840 LOCATE 12,22:INPUT"",D5: LOCATE 12,34:INPUT"",E5: LOCATE
     12,16: INPUT"",F5
5845 LOCATE 12,52:INPUT"",G5: LOCATE 12,28:INPUT"",H5
5850 IF (A5+B5+C5+D5+E5+F5+G5+H5)<>10, THEN BEEP: GOTO 5835
5855 RETURN
5860 GOSUB 5835
5865 GOTO 5895
5870 LOCATE 13,28:INPUT"",A6: LOCATE 13,46:INPUT"",B6: LOCATE
     13,16: INPUT"",C6
5875 LOCATE 13,52:INPUT"",D6: LOCATE 13,40:INPUT"",E6: LOCATE
     13,10: INPUT"",F6
5880 LOCATE 13,22:INPUT"",G6: LOCATE 13,34:INPUT"",H6
5885 IF (A6+B6+C6+D6+E6+F6+G6+H6)<>10, THEN BEEP: GOTO 5870
5890 RETURN
5895 GOSUB 5870
```

```
5900 GOTO 5930
5905 LOCATE 14,22:INPUT"",A7: LOCATE 14,40:INPUT"",B7: LOCATE
     14,52: INPUT"",C7
5910 LOCATE 14,34:INPUT"",D7: LOCATE 14,10:INPUT"",E7: LOCATE
     14,28: INPUT"",F7
5915 LOCATE 14,16:INPUT"",G7: LOCATE 14,46:INPUT"",H7
5920 IF (A7+B7+C7+D7+E7+F7+G7+H7)<>10, THEN BEEP: GOTO 5905
5925 RETURN
5930 GOSUB 5905
5935 GOTO 6000
5940 LET CW%=(G1+A2+H3+D4+B5+F6+E7)
5945 LET CH%=(D1+B2+A3+H4+F5+C6+G7)
5950 LET SH%=(F1+E2+C3+B4+D5+G6+A7)
5955 LET PLA%=(C1+G2+D3+E4+H5+A6+F7)
5960 LET RI%=(A1+C2+F3+G4+E5+H6+D7)
5965 LET ME%=(H1+D2+G3+C4+A5+E6+B7)
5970 LET TW%=(B1+F2+E3+A4+C5+B6+H7)
5975 LET CF%=(E1+H2+B3+F4+G5+D6+C7)
5980 LOCATE 16,9:PRINT CW%: LOCATE 16,15:PRINT CH%: LOCATE 16,21:
     PRINT SH%
5985 LOCATE 16,27:PRINT PLA%: LOCATE 16,33:PRINT RI%: LOCATE
     16,39: PRINT ME%
5990 LOCATE 16,45:PRINT TW%: LOCATE 16,51:PRINT CF%
5995 RETURN
6000 GOSUB 5940
6005 INPUT"",K$:GOTO 1200
6010 REM-----------------------------------------------
6015 REM DISPLAY BELBIN'S SPI
6020 REM-----------------------------------------------
6025 GOTO 6160
6030 GOSUB 5630
6035 LOCATE 8,33:PRINT A1: LOCATE 8,45:PRINT B1: LOCATE 8,27:PRINT
     C1
6040 LOCATE 8,15:PRINT D1: LOCATE 8,51:PRINT E1: LOCATE 8,21:PRINT
     F1
6045 LOCATE 8,9:PRINT G1: LOCATE 8,39:PRINT H1
6050 LOCATE 9,9:PRINT A2: LOCATE 9,15:PRINT B2: LOCATE 9,33:PRINT
     C2
6055 LOCATE 9,39:PRINT D2: LOCATE 9,21:PRINT E2: LOCATE 9,45:PRINT
     F2
6060 LOCATE 9,27:PRINT G2: LOCATE 9,51:PRINT H2
6065 LOCATE 10,15:PRINT A3: LOCATE 10,51:PRINT B3: LOCATE 10,21:
     PRINT C3
6070 LOCATE 10,27:PRINT D3: LOCATE 10,45:PRINT E3: LOCATE 10,33:
     PRINT F3
6075 LOCATE 10,39:PRINT G3: LOCATE 10,9:PRINT H3
6080 LOCATE 11,45:PRINT A4: LOCATE 11,21:PRINT B4: LOCATE 11,39:
     PRINT C4
6085 LOCATE 11,9:PRINT D4: LOCATE 11,27:PRINT E4: LOCATE 11,51:
     PRINT F4
6090 LOCATE 11,33:PRINT G4: LOCATE 11,15:PRINT H4
6095 LOCATE 12,39:PRINT A5: LOCATE 12,9:PRINT B5: LOCATE 12,45:
     PRINT C5
6100 LOCATE 12,21:PRINT D5: LOCATE 12,33:PRINT E5: LOCATE 12,15:
     PRINT F5
6105 LOCATE 12,51:PRINT G5: LOCATE 12,27:PRINT H5
6110 LOCATE 13,27:PRINT A6: LOCATE 13,45:PRINT B6: LOCATE 13,15:
     PRINT C6
```



```
6115 LOCATE 13,51:PRINT D6: LOCATE 13,39:PRINT E6: LOCATE 13,9:
     PRINT F6
6120 LOCATE 13,21:PRINT G6: LOCATE 13,33:PRINT H6
6125 LOCATE 14,21:PRINT A7: LOCATE 14,39:PRINT B7: LOCATE 14,51:
     PRINT C7
6130 LOCATE 14,33:PRINT D7: LOCATE 14,9:PRINT E7: LOCATE 14,27:
     PRINT F7
6135 LOCATE 14,15:PRINT G7: LOCATE 14,45:PRINT H7
6140 LOCATE 16,9:PRINT CW%: LOCATE 16,15:PRINT CH%: LOCATE 16,21:
     PRINT SH%
6145 LOCATE 16,27:PRINT PLA%: LOCATE 16,33:PRINT RI%: LOCATE
     16,39: PRINT ME%
6150 LOCATE 16,45:PRINT TW%: LOCATE 16,51:PRINT CF%
6155 RETURN
6160 GOSUB 6030
6165 INPUT"",K$:GOTO 1200
6170 NEXT Q
6175 END
```

APPENDIX L: SAMPLE PRINTOUTS FROM DOORMAT.

1. INTRODUCTION. 635

2. RAW DATA MATRIX. 636

3. DEVIATIONS FROM THE ROW MEAN. 636

4. RANK ORDER MATRIX. 637

5. SUMMARIES. 637

6. SYMLOG, AsO and SPI. 638

1. INTRODUCTION.

The structure of Doormat was described in the last appendix. This appendix gives examples of the printouts, which are obtained using the screen dump facility of IBM PCs and clones.

The first printout overleaf displays the raw data matrix, with totals, means and standard deviations given for all rows and columns (minus self ratings), plus the grand total and grand mean for the entire matrix. These are returned automatically once the raw data has been entered.

Beneath this is the matrix obtained when values within the rows are expressed as deviations from the appropriate row mean. Column totals are also given. This matrix is optional, being selected via a menu.

Also optional is the matrix shown on page 637. This displays the raw data matrix expressed as rankings assigned to values in the rows, together with column means.

The final optional display drawn from the Mat# programmes displays the summary vectors derived from the matrices described above. The summaries in this case consist of the column means of the other matrices, together with rankings assigned separately by the summary algorithm.

At the end of the appendix are two separate displays, although in practice they have always been printed on a single sheet. The top display gives a summary of SYMLOG scores for 'Self', 'Wish', LPC and MPC (see last appendix), together with graph distances in two and three dimensions. It might be noted that the SYMLOG totals can be entered either direct, or may be calculated from raw data entry. Beneath this is a matrix of scores derived from Belbin's SPI, together with column totals.

At the head of each page information is given concerning the series, group number, number of members and date of session. In addition, the printouts from the Mat# programmes indicate which sociometric scale is displayed, and those from the SYMLOG programme indicate which subject number is displayed.

SERIES: MAS1-2. *GROUP No.: H1. *SESSION No.: 2.
DATE OF SESSION: 19/11/84. *No. OF MEMBERS.: 5.

Qu.2: GUIDANCE

S	1	2	3	4	5	T	$\bar{X}$	SD
1	90	56	76	56	56	244	61	8.66
2	65	50	65	65	65	260	65	0
3	34	32	77	71	83	220	55	22.42
4	71	59	37	50	37	204	51	14.63
5	80	80	80	80	80	320	80	0
T	250	227	258	272	241	¦ Grand Total = 1248		
$\bar{X}$	62.5	56.75	64.5	68	60.25	¦		
SD	17.32	17.02	16.8	8.75	16.57	¦ Grand Mean = 62.4		

Qu.2: GUIDANCE (Deviations from row mean)

S	1	2	3	4	5
1		-5.00	15.00	-5.00	-5.00
2	0.00		0.00	0.00	0.00
3	-21.00	-23.00		16.00	28.00
4	20.00	8.00	-14.00		-14.00
5	0.00	0.00	0.00	0.00	
$\bar{X}$	-.25	-5	.25	2.75	2.25

SERIES: MAS1-2. *GROUP No.: H1. *SESSION No.: 2.
DATE OF SESSION: 19/11/84. *No. OF MEMBERS.: 5.

Qu.2: GUIDANCE (Mean Ranks)

S	1	2	3	4	5
1		3	1	3	3
2	2.5		2.5	2.5	2.5
3	3	4		2	1
4	1	2	3.5		3.5
5	2.5	2.5	2.5	2.5	
$\bar{X}$	2.25	2.88	2.38	2.5	2.5

Kendall's W (Taylor's Modification) = .05 (S' = 9.722221)
SDr: .75 .74 .89 .35 .94
Xsdr = .7342313 Sigma = .34

SERIES: MAS1-2. *GROUP No.: H1. *SESSION No.: 2.
DATE OF SESSION: 19/11/84. *No. OF MEMBERS.: 5.

Qu.2: GUIDANCE SUMMARIES (Means)

RATINGS	62.5	56.75	64.55	68	60.25
(Ranks)	3	5	2	1	4
DEVIATIONS	-.25	-5	.25	2.75	2.25
(Ranks)	4	5	3	1	2
RANKS	2.25	2.88	2.38	2.5	2.5
(Ranks)	1	5	2	3.5	3.5

KENDALL'S W (Taylor's Modification) = .05 (S' = 9.722221)

Sigma = .34

MAS1-3. Gn.: 1. N: 5. Sn. 1. Date: 12/3/86. Subject 1.

SYMLOG

	SELF	WISH	LPC	MPC
U	8	12	2	10
	00	7 U	8 D	4 U
D	8	5	10	6
P	12	13	8	8
	6 P	7 P	4 P	2 P
N	6	6	4	6
F	6	12	4	12
	5 B	4 F	5 B	8 F
B	11	8	9	4

Graph Distances
Self/Wish = 11.44552
LPC/MPC = 17.80449

Self/LPC = 8.246211
Self/MPC = 14.17745
Wish/LPC = 17.74824
Wish/MPC = 7.071068

Cronbach's D
Self/Wish = 4.358899
LPC/MPC = 5.291503
Self/LPC = 5.099020
Self/MPC = 5.099020
Wish/LPC = 5.744563
Wish/MPC = 3.872984

ASO: LPC(T) = 31 [M]; MPC(T) = 50 [H]; ASO(T) = 9.848858 [M]
LPC(S) = 40 [M]; MPC(S) = 42 [M]; ASO(S) = 6 [L]
LPC = 71 [M]; MPC = 92 [H]; ASO = 11.53256 [M]

BELBIN'S TEAM ROLE PERCEPTION INVENTORY

	CW	CH	SH	PL	RI	ME	TW	CF
I	1	2	1	0	0	3	3	0
II	1	0	0	2	2	1	1	3
III	0	2	1	4	3	0	0	0
IV	0	2	3	2	0	0	3	0
V	1	0	1	2	1	1	2	2
VI	0	1	4	1	2	0	2	0
VII	0	0	3	2	3	2	0	0
TOTAL	3	7	13	13	11	7	11	5

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In compiling this list of references, the following conventions have been adopted.

Where modern editions of old works, or paperback editions of earlier casebound publications, have been consulted, the date of the earlier edition is given, and in such circumstances the publisher's name is followed by the date of the edition used. This is particularly important where a modern edition has been issued of a work by a dead author; it seemed bizarre to cite a recent reference from someone who has been dead for several decades. In some cases, however, the date of original publication was not available (e.g. Gardiner, 1988), and in these cases the modern publication date is used.

Names beginning with 'Mac' and 'Mc' have been treated strictly alphabetically, as have names with 'St'. In the last case, these names have been added after, for example, 'Sprott', and before 'Steiner'.

Where names contained continental honorifics such as 'de' and 'von', the initial capital of the name following has been used. For example 'von Bertalanffy' appears with surnames beginning 'B' and not 'V'. The only exceptions are names which appeared with the honorific in capitals, such as De Lamater and Le Bon.

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