SPATIALITY IN SMALL GROUP INTERACTION

by

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ABSTRACT

The social sciences have usually treated the physical environment in group interaction as a given, rather than as an influential factor on human behaviour. Recently, sociologists, psychologists, psychiatrists, architects and geographers have come to view the importance of the inter-relationship between man and his environment. This change of orientation, however, has begun to produce an overemphasis on the impact of the environment with a consequent neglect on the behavioural use of the environment. A comprehensive ecological orientation must stress linkages in both directions - man's use of and affect on the environment and the effect and impact of the environment on man's behaviour.

Although this thesis is not an empirical study, it does attempt, by a review of the literature available in this field, to show that man does not merely respond or adapt to his surroundings but constructs and modifies the environment in his interpersonal exchanges with others.

The aim of this thesis is to underscore the fact that man's active use of the physical environment is a part of his non-verbal behaviour. This proposition is based on the demonstrable assumption that the spatial and physical properties of the environment are part and parcel of ongoing social interaction. The specific intent of the thesis is to integrate the research on spatial arrangement in small groups, to suggest some possible directions for further research in this field, and to note some potentially useful applications of the present findings.

The thesis focuses on three major questions:

1. How man structures microspace.
2. How he relates physically to persons with whom he is interacting.
3. What is communicated by different spatial arrangements.

The studies reviewed, though differing widely in approach and methodology, all denote the importance of spatiality in social interaction. Taken together, they reveal the conjoint functions of culture, personality, task, and environment in accounting for spatial arrangements in small groups.

The arrangement of the thesis develops its focus from the most primary level, the individual, to the processes of interaction in small groups concerning spatial arrangement, spatial adjustment and interpersonal impact, to the level of the hierarchical organization of a group. The validity of the researchers' hypotheses is examined by brief evaluations of the methodologies of the various studies reported, leading to more general commentary about the state of research in this field. The body of the thesis contains four chapters which link the issue of spatiality to major themes in group interaction: emotional climate and attitude, nature of task, communication patterns, and leadership. The final section of each chapter points out some possible avenues of research and application, and a concluding chapter puts the issues of spatiality, nonverbal behaviour, and group interaction in integrated perspective.
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PREFACE

The ecology of human behaviour or the nature of the mutual interaction between man and his environment, is certainly not a new topic. However, for social scientists the physical environment has been conceived for many years as a given, rather than as a source of parameters for understanding human behaviour.

Recently psychologists, psychiatrists, architects, geographers, and others have been trying to understand the complex relationship which man has with his physical environment. Recognition of the importance of these relationships has led to the formulation of problems in terms of 'interpersonal-ecological' 'sociophysical' and 'spatial behaviour' - all of which attempt to link man and his environment.

An ecological orientation to interpersonal behaviour includes the study of how man mutually interacts with his physical environment in the course of managing his relationship with others. In a sense, it can be illustrated as a simple ABX model, where A and B refer to social actors, and X includes physical aspects of the environment. This framework is based on the general assumption that the spatial and physical properties of the environment are part and parcel of ongoing social interaction.

In most human group situations, individuals intentionally position themselves with respect to others. Estman and Harper (1971)
state that: "People 'shop' in a spatially defined market, to find that space which most suits their purpose. A user's choice of space may be considered as that location which benefits him most." (p.433)

Osmond (1959) posited that the physical environment may promote or discourage certain human behaviours. To classify spaces with respect to their support of social interaction, he called those that promote social interaction Sociopetal, and those that discourage it, Sociofugal.

Since man does not merely respond or adapt to his physical environment, but uses and shapes it in his interpersonal exchange with others, a comprehensive ecological orientation must stress linkages in both directions --

a) Man's use of, and effect on the environment.

b) The effect and impact of the environment on man's interpersonal behaviour.

The purpose of this thesis is to make a small beginning at bringing some conceptual order to this broad field of study by integrating the research on spatial arrangement in the sub-field of small groups, by suggesting some possible directions for future research in this field, and by noting some potentially useful applications of the current findings which in some cases go beyond the relatively narrow confines of small-group interaction.

Before undertaking a review of specific studies in the field, it is necessary to discuss the basic concepts which have generated this whole area of inquiry. The first section of the introduction reviews some major concepts and research trends in the field of spatial behaviour. This is followed by an illustrative application of these concepts, and a review of studies in the area of spatial behaviour within group process.
CHAPTER I

Introduction

Space has two different meanings:

1. The more familiar one refers to 'space' in the Geographic sense.

2. The second facet of the term 'space' can be called "personal space of the organism".

Every living thing has a physical boundary that separates it from its external environment. Beginning with the single-celled bacteria, and ending with man, every organism has a detectable limit which defines its shape and the space it occupies. As one goes up the phylogenetic scale, another non-physical boundary appears which exists outside the physical one. This new boundary is harder to delimit than the first, but is just as real. Hall calls it the "organism's territory". The act of laying claim to, and defending a territory is termed "Territoriality".

The concept 'territoriality' which originated in animal studies, i.e., Ethology, has broad documentation. The following scientists are a few who have studied territoriality: Ardrey (1966), Carpenter (1958), Darling (1937), Hediger (1961), Howard (1920, 1948). In Ethology the concept has generally implied more or less permanent attachment to a relatively specified area, as well as active defence of that space against intrusion. The patterns of acquisition and defence of certain geographic
areas were found to be species-specific in the animal kingdom. Territoriality also refers specifically to the protective distance maintained between the parties involved. Furthermore, territoriality has been found to be equally important within a social unit. The amount of space an animal can maintain between himself and others, has been taken to be a reliable indication of the animal's relative social position (King 1965).

The application of a concept derived from animal studies to human behaviour inevitably raises questions concerning the correspondence of the behaviours. There is some agreement (Hediger 1950, Lorenz 1966, McBride 1964) that there is an instinctual biological basis for territorial behaviour in animals. Among those working with human spatial behaviour, some — Ardrey 1966, Esser et al 1965, Lorenz 1967 — regard territorial drive and dominance order in man as universally instinctive biological behaviour as well. Others such as Sommer and Becker (1969) and Leach (1966), do not believe that the underlying mechanisms of animal and human territoriality are identical. The issue remains unresolved in the absence of evidence demonstrating the case one way or the other in relation to patterns of animal and human territoriality. Whether territoriality is solely a product of genes or culture, or culture alone, or some combination of the two, is often debated. Nevertheless, it does appear to be a pervasive behavioural mode amongst humans. Hall has outlined territoriality as "one of the primary message systems by which man communicates" (Hall and Trager 1953).
Social scientists have become impressed with the utility of the concept of territoriality as it has been defined by ethologists. However, when the term is applied by social scientists to human behaviour, the concept — "Personal Space" — is preferred. In this respect personal space may be defined as the area immediately surrounding the individual, where the majority of his interaction with others takes place.

Personal space is clearly a form of territoriality but, as Sommer (1959) points out, it can be distinguished from territoriality in two ways:

a) It has no fixed geographic reference points.

b) It moves about with the individuals and expands and contracts under varying conditions.

A personal space is not a defined area, but rather a dynamic distance-maintaining system, which is part of the individual's general interaction pattern. While differences between individuals alter their spatial behaviour to a certain extent, the overall patterns are culturally bounded (Hall 1966).

Personal space or personal distance makes no assumption about the space per se, but rather concentrates on the inter-personal relations which define the shape of the space. The individual defines relationships by maintaining a certain distance between himself and others. It is the relative distance, not a fixed spatial area, that is at stake. In most cultures, a polite individual will generally alter his own behaviour in an effort to maintain an acceptable distance, rather than relying upon the other interactant.
Social relationship and attitude has been shown to be related to the approach distance between individuals in a variety of situations. In general, the study of the physical environment or the spatial influences on behaviour has come to be known as proxemics. The definition of proxemics includes the total behaviour of man in regard to the structuring of space, from the way he perceives his environment in terms of space, to the way he uses space in his interpersonal relations. One assumption of proxemics is that the relationship between an individual's spatial behaviour and his surroundings promotes certain behaviour. This behaviour may result from both self-selection from the environment, and environmental support. A classic example of this concept involves the position of a leader in a group. A person sitting at the head of a table may have consciously positioned himself in order to lead the group; conversely if an individual happens to be sitting there, he will find himself advantageously positioned in order to assume a leadership role (Strodtbeck and Hook 1961). Edward T. Hall, who coined the term "Proxemics", defines it as: "the inter-related observations and theories of man's use of space as a specialized elaboration of culture" (1966:1). Hall linked this term with the concept of territoriality on three levels:

a) the manipulation of a microspace in face to face interaction.

b) man's interaction with his architectural structure.

c) man's relationship to the urban and non-urban areas.
In keeping with the nature of this thesis, the discussion of proxemics will be limited to the human perception, structuring, and use of space on the interpersonal level. Such questions as how man structures microspace, how he relates physically to persons with whom he is interacting, and what is communicated by these physical relationships, will be discussed. Proxemic behaviour will also be viewed as "a constellation of sensory inputs that is coded in a particular way" (Hall 1968:94), as illustrated by the process by which spatial behaviour provides cues which serve as communicative devices that facilitate or hinder the development of certain patterns of interaction.

The study of ecology covers both the distribution and the density of organisms. Within the social sciences the majority of ecological studies have dealt with larger stable human aggregations rather than arrangements within a small group. In small group research, social scientists have usually focused upon the effects of such variables as group size, type of leadership, and various personality traits, on group interaction. Yet the consideration of space as an important variable is a relatively recent phenomenon, as there has been a tendency to neglect the spatial arrangement of individuals as a significant variable in any type of social intercourse. The reason for the previous neglect is not quite clear. It is possible that space was considered too unimportant to
have any effect relative to task or subject variables. Alternatively, the influence of spatial arrangement in social situations may have been so generally accepted as to be treated as given and not requiring special attention.

Systematic study of spatial arrangements as an independent variable in face-to-face groups, or "small group ecology" as the field has been termed, is a comparatively recent development. At present there is neither a general framework nor programatic strategy for research in the field of proxemics in small group interaction, and only a few guiding theoretical concepts have been postulated. Generally speaking, the field appears to be characterized by isolated programs of research, none of which are comprehensive. For example, Kuethe 1962a, 1962b, 1964; Fisher 1967; Kuethe and Weingartner 1964; focussed on physical distance and use of intervening objects in interpersonal situations such as casual acquaintance versus good friends, adults versus children, normal versus emotionally disturbed subjects and homosexuals. Hall (1955, 1959, 1963, 1966) emphasizes the way in which man consciously and unconsciously structures his microspace, and he has developed a notational system for observational recording of salient spatial features of social interactions. He has proposed that the distances that participants maintain in face-to-face interaction are related systematically to the nature of interaction as they vary from intimate, through casual-personal, to social-consultative and finally public distance. Associated with each social distance are cue and information exchange properties such as kinesthetic or possible body contact, thermal, olfactory, visual and oral. Other approaches stem from
clinical psychology and psychiatry. Esser 1966, Esser et al 1965, Almond and Esser 1965, studied spatial behaviour in psychiatric wards. Horowitz 1965, Horowitz, Duff and Stratton 1964, analyzed spatial behaviour in interaction between therapist and patient. Winick and Holt (1961) reported on the significance of chairs and seating positions in group therapy situations. Sommer, a social psychologist, had done extensive work in this area, including the study of seating arrangements of schizophrenics (1959), seating with respect to leader (1961), how people position themselves in libraries so as to avoid others (1966), and seating preferences in different types of classrooms as a function of distance and accessibility to an instructor (1967a). Researchers studying proxemics in human groups have utilised a broad range of methodology ranging from controlled laboratory experiments to simple observational studies in natural settings. As yet, no specific method has been found to be unique to the study of proxemics, or more revealing of its complexity than any other method.

The organization of this thesis develops its focus from the most primary level -- the individual -- to the processes of interaction in small groups concerning spatial arrangement, spatial adjustment, and interpersonal impact, to the level of the hierarchical organization of a group (the evolvement of leadership).

Specifically, Chapter I focuses on the impact of spatial arrangement upon the individual in terms of his interpersonal attitude and the overall emotional climate that typify his relationships with others
Chapter 2 centers upon the nature of interaction (e.g., co-action, co-operation, competition) in a small group. In this chapter, in addition to individuals' spatial adjustments (vis-a-vis others) and reaction to spatial arrangements, a further element is added: the task environment of the group.

Chapter 3 considers the effects of spatial arrangement on the communication network which evolves in a group and the effects of communication patterns on spatial choices made by members of the group. The patterns of communication which evolve can be considered as the infrastructure of an organization.

Chapter 4 focuses on the "organization" which emerges in the small group and, in particular, the establishment of a hierarchy and leadership.

The internal structure of each chapter consists of three parts. The first part consists of a review of the most prominent hypotheses and concepts which have been used to explore and describe the group process in question. In the second part, the merit of these hypotheses are examined by brief evaluations of the various studies reported and through providing cross-references of supporting evidence. The final section of each chapter points out some possible avenues of research and application. It should be noted that the focus of this thesis is deliberately narrow and no attempt is made to consider other variables affecting each of the processes considered, i.e. variables other than the effects of spatial arrangement.
CHAPTER II.

Spatial Arrangement, Emotional Climate and Attitudes

A. Conceptual Background

Spacing of individuals in any face to face group is not random, but follows from the personality and cultural background of the individuals involved, what they are doing and the nature of the physical setting. In social situations, it has been observed that interpersonal space may accent, qualify and delimit verbal interaction. Generally speaking, we can interpret the way in which the members of the group arrange themselves spatially as one form of non-verbal communication. It is likely that in almost all interpersonal situations, physical proximity may both reflect and affect the interpersonal profile of attitudes and the overall emotional climate.

This chapter will attempt to show, on the basis of the available literature, how spatial arrangements serve as an important factor in determining the emotional climate and the intensity of feeling as well as attitudes of participants within an interpersonal setting.

In order to show how spatial distance has a communication value, to transfer and perceive a variety and range of attitudes, it is necessary to first show that the ability to assess the appropriate distance for any social interaction is a general quality. Animal studies indicate that individual distance is learned during the early years of life. Early in his life the member learnt how far he must stay from his species members.
McBride (1963) who has studied the spatial behaviour of animals in confinement has found that avoidance movements and turning aside are common reactions to crowding, particularly when a submissive animal is close to a dominant animal. Crook (1961) studied the spacing mechanisms in birds. He found that each bird maintains individual distance. Individual distance he defined as the area around a bird within which the approach of a neighbouring bird is reacted to with either avoidance or attack. Crook suggested a number of measurements when studying individual distance:

1. The arrival distance - how far from settled birds a newcomer will land,
2. The settled distance - the resultant distance after adjustments have occurred,
3. The distance after departure.

These concepts have analogues in human behaviour and probably have stimulated much of the work concerning intrusion and violation of spatial norms.

Among human beings, individual distance is not an absolute figure but varies with the relationship between the individuals and their bodily orientations. A violation of expected interactional distance by one participant produces a variety of adaptive responses on the part of others (the victims). The intensity of reactions is influenced by many factors including territoriality, the dominance-submission relationship between participants, the locus of the violation and, when relevant, attribution of sexual motives to the violator of norms.

Felipe and Sommer's study (1966, Exp. 2) showed that spatial invasion and violation of expected distance have a disruptive effect
and can produce reactions ranging from flight at one extreme to antagonistic display at the other. Common reactions included the following activities: shift in position, interposing a barrier between "victims" and the invader, looking away to avoid extensive eye contact, and moving farther away. If those were precluded by the situation or failed because the invader shifts position too, (treatment 1 called for E to maintain the arrival distance, and to keep S from adjusting to a settled distance) flight reactions occurred.

Mehrabian (1969) used the term "immediacy" to refer to the cumulative effects of increasing proximity, touching, forward leaning, eye contact and directness of body orientation between interacting persons. The relationship between these nonverbal behaviours is apparently as Argyle and Dean (1965) claimed, a reciprocal or compensating one. Thus in order to maintain intimacy or immediacy at a comfortable level, when one dimension becomes too intense, compensation can be made by decreasing the level of one or more of the other dimensions.

Patterson and Mullens and Romano (1971) attempted to examine the specific compensatory behaviour in response to the "immediacy" of the intruder. The results indicated that compensatory reactions were produced as a function of the increasing immediacy of an intruder. Leaning away was the most significant response and so was blocking which involved either turning away from the intruder or using a hand or elbow in a position to screen the intruder. The findings are consistent with the view that a variety of non-verbal behaviour may be reciprocally altered to maintain a relatively constant degree of intimacy or interpersonal involvement.
Felipe and Sommer (1966, Exp. 1) attempted a similar study of the reaction to spatial invasion with mental patients. The reactions of the patients were very similar to those of normal subjects in similar conditions. Within two minutes, 36% of the experimental subjects had been driven away. Within nine minutes fully half of Ss had departed, compared with only 8% of the control patients. At the end of the twenty minute session, 64% of the Ss had departed, compared with 33% of the controls. The patient's actual departure from his chair was the most obvious reaction to the intrusion. However, again, many more subtle indications of the patients' discomfort were evident. Typically the victim would immediately face away from E, pull in his shoulders, and place his elbows at his side. Mumbling, irrelevant laughter and delusional talk also seemed to be used by the "victim" to keep E at a distance.

These observations suggest that the biological concept of individual distance between animals has a parallel in human behaviour, termed personal space. However, the concept when applied to humans is extended to include a broader set of behavioural dimensions specific to humans only. Personal space is hypothesized to act as a buffer zone which serves as protection against threats to one's emotional well-being (Horowitz and Duff and Stratton 1964).

The perception of threatening elements in inter-personal situations, whether originating predominantly from environmental or intrapsychic sources, seems to call forth measures for self protection. This applies to threats to one's self-esteem as well as to the threat of bodily harm. Thus environmental or internal threats to self-esteem
should produce greater spatial distances. It is known that greater spatial distances will be used under stress conditions by highly anxious people and by people who perceive their body-image boundaries as weak or unstructured.

In Luft's study (1966) pairs of female subjects were asked to rate their impressions of one another. Following that, estimates of the distance between them were related to their manifest anxiety scores. The results show that in six of seven dyads, the individuals having the greater manifest anxiety in each pair, judged the distance between herself and her partner, significantly closer than did her less anxious partner. The judged distance by the more anxious member was also less than the actual distance.

Fisher, Cleveland and Horowitz (1966) have presented conceptual formulations which suggest that the Rorschach variable of body-image boundary may be related to personal space. They stated that:

"A person with a weak body-image boundary is held to 'create' exterior conditions which will artificially provide a substitute boundary." (p.355)

Such a perception of one's body boundary as lacking definite structure and substance, or as weak and permeable, should result in greater use of personal space. Leipold (1963), Patterson and Holmes (1966) found that extroverts have a tendency to approach the experimenter more closely than introverts in interview sessions. The same notion that personality weakness may be supplemented by spatial usage led Dosev and Meisels (1969) to their study in which personality variables were assessed by the Rorschach test. In this study, personal space was measured by having subjects approach each other, take a seat close to or far from the experimenter, and trace one silhouette in relation to another. The
results support the hypothesis of increasing spatial distance by people high in anxiety. In an experimental setting, galvanic skin responses (GSR's) were found to vary as a function of distance and the nature of the interaction (McBride, King and James 1965). Approaching a subject from the front produced a greater response than approaching from the side, which in turn produced a greater response than that from behind. GSR's at 1 - 3 feet did not differ significantly, but GSR's at 9 feet were significantly less than those at the shorter distance.

Psychiatric literature rarely refers to the use of space by psychotherapists and patients, however, like other nonverbal communication, space is probably artfully and intuitively used by most psychotherapists. Apparently, closeness and distance as well as the relative position of the patient and the therapist are modulated in different forms of therapy. Furthermore, psychotherapists, who are more successful in treating schizophrenic patients, appear to have relatively less rigid attitudes toward the structure of space in experimental situations than those who are less successful (Pollack and Kiev 1963).

Various studies of psychiatric patients' use of personal space strengthen the assumption that personal space and the perception of personal space is not random, but instead a facet of personality.

Sommer (1959) found that schizophrenics approached a seated decoy differently from a normal subject. In discussion sessions, schizophrenics remained more distant from partners than did normals, who typically made use of corner positions of a table. Horowitz, Duff and Stratton (1964) supported the notion that schizophrenics have a
distorted concept of personal space. This was manifested by greater avoidance tendencies of others than exhibited by normals. One can speculate on whether this relates to the schizophrenic's lack of stable self-image and clear self-boundaries. A person, unsure of who he is, may not be clear as to where he ends and the next person begins. Searless (1960) described patients who may confuse their own spatial boundaries with those of the room. Although it might be true that people with mental or emotional problems have a distorted concept of appropriate personal distance, this distortion is reinforced by the responses of the "normals". Sommer hypothesized that schizophrenia may exhibit a distorted concept of personal space which causes others to become offended and withdraw. Kleck and his associates (1958) have undertaken a series of studies on the effect of stigma upon interaction distance. College students were asked to go into a room and converse with another person who was sometimes described as an epileptic. The findings indicated that the students sat farther from the other person when he was described as an epileptic than when he was not. The experiment was repeated with the other person described as an amputee. In this case, college students were asked to enter a room and teach either an amputee in a wheelchair, or a normal person how to fold paper figures. The results indicated again that the students sat farther from the amputee than from a supposedly normal individual. Kleck concluded that the isolation experienced by the stigmatized individuals being kept at a greater distance, must have some effect upon their motivation, attitudes, and feelings of belonging with normal individuals.
In the foregoing, we have extended the biological concept of individual distance to humans by adding human-specific dimensions of behaviour to the definition serving the extended concept - personal space. We have surveyed the role of personality factors in determining desired personal space, and the role that personal space (and deviations from the desired space) play in determining emotional climate. We now proceed to examine the relationship between attitude profiles and spatial choices, as well as the effects of imposed spatial configurations on the processes of attitudinal change. It is likely that in non-constrained or informal interpersonal situations, proximity may function psychologically as an indicator of positive-negative interpersonal effect. Attitude in this chapter will be defined as the degree of liking, positive evaluation and broad preference of one individual toward another.

Little (1965) intended to assess the effect of the degree of acquaintance between two members of a dyad on their interaction distances in different settings. The first prediction was that interaction between two persons classified variously as friends, acquaintances, or as strangers, would take place at an increasing rank order of distance. The second prediction was that the average interaction distance would increase with increased impersonality of the setting. The task involved the placement of line drawing figures, manipulation of silhouette photographs, and a staged human model. The results indicated a clear inverse relationship between degree of acquaintance of figures and mean distance score. It was found that interpersonal distances in a dyad were markedly influenced by the perceived degree of acquaintance of the members, and to a lesser extent by the setting.
Willis (1966) in his natural-setting observations, attempted to study the initial speaking distance of verbal interaction. He concluded that the relationship between two people is reflected in their use of space. He found that strangers begin conversations at distances greater than that of acquaintances. Moreover, speakers tend to stand more closely to women than to men. Compared to men, women stand more closely to good friends but farther than those they describe just as friends.

Mehrabian (1968) studied the relationships between a communicator's posture, orientation, and distance from his addressee on one hand, and his attitude toward the addressee on the other hand. Subjects were requested to imagine themselves in situations involving different kinds of addressees and to sit as if they were actually interacting with them. There were five levels of attitude which were conveyed to a subject by asking him to imagine addressees whom he liked intensely, liked moderately, neither liked nor disliked, disliked moderately, or disliked intensely. The findings showed that regardless of the sex of the communicator or addressee, distance was a decreasing linear function of positive attitude toward the addressee. The hypothesis that eye contact as a function of attitude will increase in a positive linear trend, was not confirmed and found to be inverse.

Porter, Argyle and Salter (1970) attempted in their study to determine how proximity is perceived as a cue in dyadic interaction. Ss held conversations with three confederates at distances of 2, 4, and 8 feet, in formal and informal conditions and then were asked to assess their own preferred proximity. Ss recorded their impressions of each
confederate on a series of 21 7-point scales, designed to cover the main dimensions of personality. The results show that proximity was not a significant source of variance on any of the 21 rating scales, despite the fact that a range of 2 feet to 8 feet was used. The authors suggested that, though proximity is certainly used to begin and end encounters, when two people are in a room together so that it is quite clear who is interacting with whom, proximity communicates no information at all. However, it appears that the more the confederates conformed to Ss' preference of proximity, the more they were judged to be excited versus bored, at ease versus self-conscious, and performer versus audience. This suggested that the perceptions of Ss at different distances would be a function of the perceiver's own preferred proximity.

Rosenfeld (1965) tried to determine whether interpersonal proximity is used as an instrumental act for the attainment of social approval. Female Ss were assigned approval-seeking, or approval-avoiding roles and were compared for their subsequent proximity to a female confederate; the experiment took place in an empty room except for two chairs. The results supported the contention that interpersonal proximity is used as an instrumental affiliative act. The mean approach distance in the approval-seeking condition was 57 inches, while the mean of the approval-avoiding condition was 94 inches. The approval-seeking Ss placed their chairs at distances comparable to which Sommer (1961) found to be characteristic of informal conversation. In Hall's terms, they were on the "near" or confidential side of neutral conversational
distances, while the approval-avoiding Ss were on the "public" side of neutrality--relative to typical American culture (Hall, 1959, pp. 208-209). In a follow-up study, Rosenfeld (1966a) found that when the distance between the subject and confederate was held constant at approximately 5 feet, female subjects instructed to win approval emitted more smiles and gesticulation than those who were instructed to avoid approval. Similarly, approval-seeking subjects were found to be more active than approval-avoiding subjects (Rosenfeld 1966a).

These findings can be explained with Argyle and Dean's approach-avoidance theory of proximity, which supposed that a person is both attracted and repelled by another. The theory postulates that spacing of individuals is one aspect of dynamic equilibrium which is a function of several inter-related variables, including physical proximity, eye contact, the nature of the task and the amount of smiling. If one of these variables is disturbed, there seems to be compensatory changes in the other. Adequate measurement of related variables such as eye contact is a substantial problem in itself. Eye contact seems to be an important factor in spatial arrangement.

According to Goffman (1963), Hall (1964) and Birdwhistell (1952) direct visual contact can be exceedingly uncomfortable and disconcerting under ordinary conditions, producing feelings of anxiety in the person upon whom the eyes are directly centered. Argyle and Dean suggested that eye contact and physical proximity are kept in a condition of equilibrium for any social interaction. They found (1965) that increasing physical proximity between E and S resulted in a decreasing of direct eye contact. The findings were confirmed by Goldberg
Patterson and Sechrest (1970) manipulated spatial distance and examined perceived differences of personality characteristics. It was hypothesized that an individual will be perceived as less socially involved as the physical distance between him and a subject rating him increases. The experiment was structured as an interview in which the subject was to rate the confederate on a series of traits. The interview took place in the front row of a classroom with the subject seated at one end and the confederate seated from one to four seats from the subject. The confederate's task was to sit at a predetermined distance from the subject, maintain a consistent mild manner, and answer the questions in a standardized fashion. The subjects completed a rating point scale of friendliness, aggressiveness, dominance, introversion and intelligence. The mean rating across all of the traits indicated that the most distant position yielded significantly lower, and hence less "favourable" ratings than the three closer positions. The results support the hypothesis that interpersonal distance can affect the formation of impressions. The specific prediction, that rating of social activity would decrease with increasing interpersonal distance, was supported by a significant linear trend. However, in the closest condition, it was frequently observed that both the subject and confederate made attempts to increase the distance between them, either by sliding their chairs slightly back or by sitting on the far edge of the seat. Thus even the confederates, who were aware of the nature of the experiment and instructed to remain relatively neutral during the interview, were obviously uncomfortable at the closest distance. This reaction
can be explained again with Mehrabian's term of "immediacy" which attributes the results to reciprocity of different dimensions of behaviour in interpersonal situations. The assumption states that there is an optimal distance for any encounter, and deviation from it will result in discomfort and attempts to restore equilibrium.

Patterson (1968) suggested that it is not unreasonable to expect a reciprocal relationship between attitudes and interaction distance. For example, Patterson said that alphabetical seating order in elementary schools is likely to produce a greater than chance number of friendships between children with last names beginning with the same letter. Furthermore, even attitudes which do not result from physical proximity or the lack of it might be altered later by structuring the distance between the parties involved. For example, according to Patterson, the approach to eliminating segregation through legislation -- to the extent that such measures bring individuals of different races into greater proximity -- corresponding attitudinal changes might be expected. Not only the physical proximity but the particular spatial arrangement has a communication value which demonstrates attitude or intensity of emotion within social interaction. Sommer (1968) studied groups of college students from the U.S.A., England, Sweden and Pakistan. Each group was asked to rate a series of 37 arrangements of pairs seated at square, round and rectangular tables, along a scale from "very intimate", "psychologically close" to "very distant" and "psychologically remote". The rank order of closeness was identical in all five countries: side-by-side seating was always the most intimate, followed by corner seating, face to face seating and various distant arrangements.
Russo (1967) in another questionnaire study, asked her subjects to rate five different dyadic seating arrangements on three dimensions: intimate-unacquainted, friendly-hostile, talkative-untalkative. The results showed highly significant differences. The order side-by-side, corner and face-to-face seating connoted the most intimate, friendly and talkative relationships, while increasing distance arrangement indicated less close relationships.

DeLong's study (1970) is the most comprehensive study in regard to perceived attitudes vis-a-vis sitting arrangements. He observed a group of 13 students who were meeting regularly in a group dynamic seminar. Members were asked to rate every member of the group in terms of "quantity of participation", "quality of participation", "leadership ability", "involvement in the group", "aggressiveness", "relaxation", "positive and negative attitudes" and "friendliness". Members' average rating on each scale was determined, and on this basis, group members were ranked. The perceived characteristics of the group members as measured, were correlated with seating positions around a rectangular table under two different contexts:

1. The traditional seminar framework.

2. The process of hierarchical formation which was triggered off by the professor's unexpected verbal withdrawal from the seminar.

The results indicate that some perceived characteristics are related to seating position independent of the context, while others are context-specific. The relationships, established between seating position and various perceived characteristics of group members, suggest that a person's actual spatial orientation within the small group carries a relatively
high communication potential. The professor verbally withdrew from the seminar at the end of the fifth session, though he continued to maintain a physical presence, resulting in the emergence of two sub-groups. The first allied themselves with the abdicating professor; the other allied themselves with the dominant student seated at the end of the table opposite the professor. The process of sub-group formation, resulted in a seating pattern of direct, proximity-based relationship, between a member's leadership rank and his distance from the position of his leadership focus, i.e., the professor or dominant student. Those with higher leadership ranks, within each sub-group, tended to have seating positions closer to their recognised leader on his right hand side. The general right/left patterning meant that relative positions within the leadership hierarchy were distributed linearly around the table. Due to this right/left orientation, members physically closer to the leader but on the side of the table to his left, were actually psychologically farther away from him than the physically more distant members on his right, by virtue of their sub-group affiliation. Within the framework of the seminar, members with seating positions nearer the recognized leader i.e., the professor, were perceived as having more "leadership ability" than those farther away. Those nearer the dominant student were perceived as having more "positive attitudes" toward the group as a whole than were those members farther away. Within the process of hierarchical formation, group members physically closer to the recognized dominant student were perceived as contributing more significantly, as possessing more leadership ability, and as having more positive attitudes toward the
group as a whole. Members situated closer to the traditional authority figure, the professor, were perceived as being less sure of themselves and more dependent upon him for support and continuous direction. These members were perceived as contributing a lower-grade quality of participation, having lesser leadership capabilities, and generally as being more tense. "Involvement in the group", insignificant during the seminar situation, became an indicator of the changes which took place in the group during the process of hierarchical formation. Members nearer the dominant student were perceived as being more involved in the group, and correspondingly, more concerned about it. In spite of the significant results, it is important to keep in mind that the group was in existence as a seminar for the full eight weeks prior to the initiation of the observational study, during which time members interacted freely, supportively as well as antagonistically. The question can be raised: how much were group members influenced by this? The potential influence of this acquaintanceship period certainly cannot be dismissed.
To assess the strength of evidence for the various studies reported, one must consider the methodology of each study and consider other research which supports (or is inconsistent with) the findings cited and the way they are interpreted. For convenience of comparison, the methodologies of the various studies are abstracted and presented in chart form. Following the chart presentation, a general evaluation is provided. The items of the chart are presented in this order:

1. Short reference to the study (for full reference one must consult the bibliography).
2. Hypotheses
3. The experimental methodology (general design, type of treatment, number of subjects for each intervention, number of treatments for each subject, media of communications permitted or controlled for, task environment).
5. Variables and their operational definitions.
6. Method of hypothesis-testing (or analysis).
7. &
8. The results and their significance.
10. Cross references to other related studies.

This format will also be used in chapters 3 to 5.
B. Summary Charts of Studies Relating Spatial Arrangement, Emotional Climate and Attitudes.

Name
Argyle and Dean, 1965. Exp. 1.

Hypothesis
Theory - Eye contact (e.c.) is a component of intimacy and is equivalent to physical proximity. Both are governed by approach and avoidance forces (the affiliation conflict theory) and are kept in a condition of equilibrium for any two people
Hypothesis - The equilibrium point for approach will be closer when there will be no e.c.

Experimental Methodology
Type - laboratory experiment
Number of Ss for each intervention - 1
Number of treatments for each S - 3
Method - S was instructed to stand "as close as comfortable to see well": 1. A life size photograph of a face. 2. E seated with eyes shut. 3. E seated with eyes open.

Subject
Source - not specified
Method of Selection - not specified
N (S adults) = 6 (m = 3, f = 3)
N (S children) = (m = 3, f = 3)

Variable and Measurement
Independent Variable - eye contact
Dependent Variable - spatial proximity (distances)

Method of Analysis
Measure of distances

Results
Confirmed the hypothesis

Significance and Strength
p < .05

Critique
- no information about the population
- sample too small for generalization
- the instructions were not clear
<table>
<thead>
<tr>
<th><strong>Name</strong></th>
<th>Argyle and Dean, 1965. Exp. 2.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hypothesis</strong></td>
<td>If spatial proximity increases, eye contact will be decreased.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Experimental Methodology</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>task oriented discussion group</td>
</tr>
<tr>
<td><strong>Number of Ss for each intervention</strong></td>
<td>1 plus confederate (C)</td>
</tr>
<tr>
<td><strong>Number of treatments for each S</strong></td>
<td>3</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>S and a confederate (C. who continually gazed at him) was asked to discuss a T.A.T. card and to make up a story.</td>
</tr>
<tr>
<td><strong>Setting</strong></td>
<td>square table with two chairs that prevent S from changing the distance.</td>
</tr>
<tr>
<td><strong>Type of Treatment</strong></td>
<td>(1) two feet, (2) six feet, (3) ten feet, eye to eye distances.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Subject</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source</strong></td>
<td>not specified</td>
</tr>
<tr>
<td><strong>Method of Selection</strong></td>
<td>not specified</td>
</tr>
<tr>
<td><strong>N (S)</strong></td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Variable and Measurement</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent Variable</strong></td>
<td>spatial proximity.</td>
</tr>
<tr>
<td><strong>Dependent Variable</strong></td>
<td>(1) amount of eye contact, (2) average length of glance</td>
</tr>
</tbody>
</table>

| **Method of Analysis** | Two observers recorded the amount and the direction of eye contact engaged in by S. |

| **Results** | Confirmed the hypothesis. (1) Distance vis-a-vis eye contact, (2) distance vis-a-vis length of glances, (3) sex differences - same sex pairs engaged more in eye contact and length of glances than opposite sex pairs. |

| **Significance and Strength** | (1) p < .001 (2) p < .01 (3) p < .001 |

<table>
<thead>
<tr>
<th><strong>Critique</strong></th>
<th>- no information about the population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- sample too small for generalization</td>
</tr>
<tr>
<td>Name</td>
<td>De Long, 1970</td>
</tr>
<tr>
<td>--------------</td>
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</tr>
</tbody>
</table>
| Hypothesis   | (1) Members closer spatially to a recognized group leader will be rated higher across all scales of different traits.  
(2) Members will sit closer to a recognized leader at a counter-clockwise patterning within the context of antagonistic sub-groups.  
(3) In sub-group affiliations the perceived characteristics of any group member will be directly related to the counter-clockwise distance between him and his recognized leader. |
| Experimental Methodology | Type - group dynamics seminar with participant observer  
Number of Sessions - 11  
Number of Ss for each intervention - 13  
Type of treatments - (1) Sessions 1 to 5 (structured) the group met in a seminar room, sat randomly around a rectangular table with a 5-1-5-1 chair arrangement. The professor occupied one end position and two students had to place their additional chairs around the table.  
(2) Sessions 6 to 11 (non-structured) the same as above, except the professor verbally withdrew from the seminar, though he continued to maintain a physical presence resulting in the emergence of two sub-groups: a. allied with the abdicating professor, b. allied with the dominant student seated at the end of the table opposite the professor. |
| Source       | students enrolled in a group dynamics seminar |  
Method of Selection - not specified  
N (Ss) = 13 (m = 11, f = 2) |
| Variable and Measurement | Independent Variable - distances: sessions 1-5 seating positions were ranked in a linear manner with the position at the head of the table opposite the professor given a rank of one; sessions 6 - 11: counter-clockwise — the seating position to the immediate left of the dominant student was assigned the rank of one.  
Dependent Variable - perceived characteristics Measurement - (1) Distances -- seating positions for all group members were recorded for each session (2) Perceived characteristics -- at the end of the fifth and eleventh sessions members were asked to rate every other member on eight-seven point scales. Each group member was ranked |
according to his average rating on each scale.
Criterion for sub-group's leader support: a. dominant student -- supported an emotional experimental format: b. abdicated professor -- supported a continuance of his previous intellectual format.

Method of Analysis
Rank order correlations computed between seating positions and rating scale rank for each set of sessions (1-5, 6-11).

Results
(1) Partly confirmed. (2) Confirmed: members allied with the professor or with the dominant student were situated on the side of the table to his right.

Critique
- the sample does not represent any population, just the group seminar
- the methods of observation and recording of data are very obscure
- the method of analysis is not clear
- the author's assumption that all the changes in the seating arrangement are due to the professor's verbally withdrawing is highly speculative
- no validation test to find out if the members were really affiliated with the leader in their sub-group setting
- there was not complete freedom in choice of seating, since Ss who came first had a wide choice of seats whereas the last few had little choice but to fill in the vacancies
- no control on interpersonal affiliation between members which may effect preference of seating regardless of leader position.
Felipe and Sommer, 1966/67. Exp. 1. Observation of the effect of spatial invasion and the produced accommodation.

**Experimental Methodology**

- **Type** - participant exp., (non-structured)
- **Task Environment** - mental hospital, E sits at a variety of distances
- **Number of Ss for each intervention** - 1 plus E
- **Number of Treatments for each S** - 1
- **Method** - male E sat beside S without saying a word; if S moved his chair or moved farther down the bench, E would move a like distance to keep the space between them constant (about 6"
- **Length of Treatments** - 20 minutes

**Subject**

- **Source** - males, patients
- **Method of Selection** - S sitting alone not engaging in any clearly defined activity
- **N (S) = 64**
- **Control Subject** - the same as above within E's visual field (the controls were just observed and no invasion was attempted)
- **E - 1 male**

**Variable and Measurement**

- **Independent Variable** - spatial invasion: variety of distances between E and S
- **Dependent Variable** - accommodation-reaction

**Method of Analysis**

Observational record of the length of time each S remained seated in his chair as compared to the control

**Results**

Cumulative percentage showed that within 9 minutes 50% of Ss had departed, and 64% within 20 minutes, compared with 8% and 33% of the control (S's actual departure from his chair was the most obvious reaction to the intrusion; however, many more subtle indications of S's discomfort were observed

**Critique**

- no control on the type of mental patients

**Cross References**

Patterson et al (1971)
<table>
<thead>
<tr>
<th>Name</th>
<th>Felipe and Sommer 1966/67. Exp. 2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis</td>
<td>Observation of the effect of spatial invasion and produced accommodation</td>
</tr>
<tr>
<td>Experimental Methodology</td>
<td>Type - participant exp. (non-structured)</td>
</tr>
<tr>
<td>Task Environment</td>
<td>study hall of university library</td>
</tr>
<tr>
<td>Number of Ss for each intervention</td>
<td>1</td>
</tr>
<tr>
<td>Number of treatments for each S</td>
<td>1</td>
</tr>
<tr>
<td>Types of treatment</td>
<td>(1) E sat on the adjacent chair to S, as close as possible without having any physical contact (about 12&quot; shoulder distance). When S moved her chair away, E followed her. (2) E sat on the adjacent chair to S at the expected distance (about 3' shoulder distance). (3) E left an empty chair between her and S (about 3½' shoulder distance). (4) E left two empty chairs between her and S (about 5';shoulder distance). (5) E sat directly across from S (about 4')</td>
</tr>
<tr>
<td>Length of Treatment</td>
<td>30 minutes</td>
</tr>
<tr>
<td>Source</td>
<td>females sitting in a library</td>
</tr>
<tr>
<td>Method of Selection</td>
<td>the first female sitting alone in a predetermined area</td>
</tr>
<tr>
<td>N (s)</td>
<td>80 (condition 1 = 20, condition 2-5 =60)</td>
</tr>
<tr>
<td>Control</td>
<td>the second female to meet the above criteria, who was visible to E. (The condition was observed from a distance and no invasion was attempted).</td>
</tr>
<tr>
<td>Independent Variable</td>
<td>spatial invasion</td>
</tr>
<tr>
<td>Dependent Variable</td>
<td>accommodation within 30 minutes</td>
</tr>
<tr>
<td>Method of Analysis</td>
<td>E noted the time of initial invasion and the time of S's departure, comparing it with the control</td>
</tr>
<tr>
<td>Results</td>
<td>Cumulative percentage show that within 30 minutes: 70% of treatment (1), 27% of treatment (2-5), and 13% of the control have departed (there was no significant difference between the scores of treatment 2-5 therefore they were combined in the analysis)</td>
</tr>
<tr>
<td>Critique</td>
<td>only female Ss were used in the study which limits generalizability.</td>
</tr>
<tr>
<td>Name</td>
<td>Goldberg, Kiesler and Collins, 1969</td>
</tr>
<tr>
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</tr>
<tr>
<td>Hypothesis</td>
<td>The closer the interaction distance the less time S will spend gazing into E's eyes</td>
</tr>
</tbody>
</table>
| Experimental Methodology | **Type** - structural laboratory experiment  
Number of Ss for each intervention - 1 plus confederate (C)  
Number of treatments for each S - 1  
Type of Treatment - S's task was to evaluate C (interviewer), who sat either 2½ feet or 6 feet directly across a rectangular table from him. C looked into S's eyes at the end of each question and gazed steadily at S's eyes when S replied |
| Subject | **Source** - college students  
**Method of Selection** - S's participation was compulsory as part of his course requirement  
N (Ss) = 37 males  
Confederate - 1 male |
| Variable and Measurement | **Independent Variable** - (1) C distance approach,  
(2) C rate of glancing  
**Dependent Variable** - S's visual behaviour  
**Measurement** - An observer discriminates the total amount of time which S directed glances into C's eyes from glances which he directed elsewhere |
| Method of Analysis | Analysis of variance using 17 Ss in each condition |
| Results | Confirmed the hypothesis: S seated 6 feet from C spent approximately 60% gazing into his eyes. S seated 2½ feet from C spent only approximately 40% gazing into his eyes |
| Significance and Strength | $f = 15.06, \, df = 1/32, \, p < .001$ |
| Critique | - the sample is not random  
- the setting: sitting at both ends of the table with a microphone in the middle of the table might effect the amount of eye contact  
- in the far condition it had to be hard for the observer to discriminate the direction of S's glances |
| Cross References | Argyle and Dean (1965) |
Name: Patterson and Mullens and Romano, 1971

Hypothesis:
(1) Increasing immediacy of the intruder will increase the frequency of flight responses
(2) As immediacy of the intruder increases, Ss will respond with less cross glances, more leaning away from E, and more body blocking responses

Experimental Methodology:
Type - participant exp. (non-structure)
Task Environment - university library
Number of Ss for each intervention - 1
Number of treatments for each S - 1
Type of treatment - (1) E seated adjacent to S at 1', (2) E seated across from S at 2', (3) E seated two seats adjacent to S at 4', (4) E seated three seats adjacent to S at 7'. During the 10 minute session, E maintains a 30% rate of glancing toward S.

Subject:
Source - college students
N = 8 -(m = 40, f = 40)
Method of Selection - S seated alone at the table E - 2 f, alternated the tasks of approaching S and rating his responses

Variable and Measurement:
Independent Variable - immediacy: distance of approach, rate of glancing
Dependent Variable - (1) length of time S remained seated, (2) S's behaviour responses: glances, leaning away from E, blocking responses

Method of Analysis:
A factorial analysis of variance computed for the dependent variables.

Results:
(1) Hypothesis not confirmed. (2) Confirmed partly: only in the first periods (5 minutes) were there found to be significant linear trends for cross glances, leaning, and blocking responses. In the second 5 minute period, only for leaning.

Significance and Strength:
p < .001

Critique:
- it is highly speculative to assume that sitting in an adjacent chair in a library can be perceived as an intrusion

Cross References:
Sommer (1968), Felipe and Sommer (1966)
<table>
<thead>
<tr>
<th><strong>Name</strong></th>
<th>Porter Argyle Salter, 1970</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hypothesis</strong></td>
<td>(1) A person who positions himself closer to S will be perceived as more friendly and well-adjusted. (2) The way S perceives a person at different distances will be affected by the type of encounter. (3) S's perceptions of other persons at different distances will be affected by S's own distance preferences.</td>
</tr>
</tbody>
</table>
| **Experimental Methodology** | Type - lab. experiment  
Number of Ss for each intervention - 1 plus confederate (C)  
Number of treatments for each S - 3  
Setting - a large room at school  
Method - S was seated in the room and was instructed to rate C on a personality scale after C places his chair at a designated distance from S.  
Type of Treatments - (1) formal condition -- S interviewed C for some imagined managerial position. (2) informal condition -- S was asked to get to know C. (3) Ss were asked to assess preferred proximity |
| **Subject** | Source - male students aged 15 to 17  
Method of Selection - not specified but Ss were chosen from two schools in Oxford  
Confederates - 3 males, graduate students aged 21 |
| **Variable and Measurement** | Independent Variable - proximity (distances)  
Dependent Variable - perceived personality traits  
Measurement - proximity -- interaction distances: C used 2, 4 and 8 feet for each type of treatment  
- preferred proximity -- assessed by the "method of limits"  
- perceived personality traits -- S recorded his impression of C on 21 seven point personality scales |
| **Method of Analysis** | (1) and (2) Analyses of variance computed for each of the 21 rating scales. (3) Correlations computed between optimal distance and rating of C at the three different distances. |
## Results

1. Hypothesis not confirmed. 

2. Hypothesis not confirmed: the type of encounter had a direct affect only on 5 scales -- performer vis-a-vis audience, self conscious vis-a-vis at ease, introvert vis-a-vis extrovert, slow vis-a-vis fast, aggressive vis-a-vis unaggressive. 

3. Hypothesis not confirmed: only three of the scales showed significant difference at the nearest and the farther distances -- excited vis-a-vis bored, at ease vis-a-vis self conscious, performer vis-a-vis audience.

## Significance and Strength

2. \( p < .01 \)  
3. \( p < .05 \)

## Critique

- The age differences between Ss and Cs might be more influential than the distance.

## Cross References

Rosenfeld (1965), Patterson and Sechrest (1970)
Name
McBride and King and James, 1965

Hypothesis
Galvanic Skin Response measures will provide an indication of the level of arousal associated with the proximity of neighbours.

Experimental Methodology
Type - laboratory experiment
Number of Ss for each intervention - 1 plus E
Number of treatments for each S - 19 consecutive 30 second periods
Medium of Communication - non-verbal
Design - S was seated at a central location in a laboratory with the G.S.R. electrodes attached to his left hand. E was seated in random order arrangements from S.
Type of Treatments - During the 10 odd number periods S looked at a neutral stimulus card. During each of the even number periods, E (of both sexes) were seated at nine different spatial-proximal and distal positions with respect to S at 1, 3, and 9 feet distances engaging/disengaging with eye contact.

Subject
Source - university students
Method of selection - not specified
N (S) = 40 (m = 20, f = 20)
E = 4 (m = 2, f = 2)

Variable and Measurement
Independent Variable - treatments, E's sex, S's sex
Dependent Variable - level of arousal indicated by G.S.R. responses.

Method of Analysis
Analysis of variance of G.S.R. responses x treatments x sex.

Results
Confirmed the hypothesis. G.S.R. responses found to vary as a function of distances, angular position and sex: (1) distances -- G.S.R. at 1 and 3 feet did not differ significantly, but at 9 feet G.S.R. were significantly less than at the shorter distances. (2) Angular position -- G.S.R. were greatest when S was approached frontally while a side approach yielded a greater response than a near approach. (3) Sex -- the response to E of the same sex was less than to E of the opposite sex.

Significance and Strength
p < .05

(cont)
Critique

- no indication about method of selection
- no information as to what was explained to S regarding the purpose of the study
- no control on any previous acquaintance between S and E, the fact that Es were staff members might influence S's response.
**Name**  
Mehrabian, 1968

**Hypothesis**  
There is a functional relationship between communicator's posture orientation, eye contact and distance from his addressee— and his attitude toward him. (1) Distance -- attitude: decreasing in a negative linear trend.  
(2) Posture orientation: (backward leaning, shoulder orientation) decreasing in a negative linear trend. (3) Eye contact -- attitude: increasing in a positive linear trend.

**Experimental Methodology**  
Type - lab experiment  
Number of Ss for each intervention - 1  
Number of treatments for each S - 10  
Method - S used a swivel chair on rollers, was requested to imagine different kinds of addressess (in regard to sex and attitudes) in a seated position, and to sit as if they were actually interacting with him.

**Subject**  
Source - undergraduate university students  
Method of Selection - not specified  
N (Ss) = 50 (m = 25, f = 25)

**Variable and Measurement**  
Independent Variable - (1) sex -- Ss (communicators). Imagined addressees (2) attitudes -- defined as the degree of liking: intensely, moderately, neutral, and the degree of dislike: moderately, intensely.  
Dependent Variable - distance, eye contact, shoulder orientation, backward leaning.  
Measurement - three raters observe S in a random order treatment through one way mirrors, and independently rated his behaviour on twelve dependent measures.

**Method of Analysis**  
Analysis of variance was performed on the mean judgement of each dependent measure obtained from the three raters.

**Results**  
(1) Hypothesis confirmed. (2) Hypothesis not confirmed. (3) Hypothesis not confirmed.

**Significance and Strength**  
(1) $p < .05$

(cont)
Critique
- no indication of method of selection
- "imaginary study" - no real control on
  the independent variables; the communication
  situation involved an imaginary addressee,
  therefore, it is hard to relate the design
  to the hypothesis the study attempts to
  investigate. It is not clear, for example,
  how the researcher could record eye contact
  in the setting of this study
- because of the unstructured design, the study
  is only explorative

Cross References
Sommer (1967), Schuette (1965)
<table>
<thead>
<tr>
<th>Name</th>
<th>Patterson and Sechrest, 1970</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis</td>
<td>(1) Interpersonal distance will affect the formation of impressions. (2) An individual will be perceived less socially active as the physical distance between him and the subject rating him increases.</td>
</tr>
</tbody>
</table>
| Experimental Methodology | Type - participant experiment  
Number of Ss for each intervention - 1 plus confederate  
Number of treatments for each S = 4  
Method - the confederate (C) sits at a pre-determined distance from S (2, 4, 6 or 8 feet), maintains a consistent mildly pleasant manner, answering S's questions in a standardized fashion  
Type of Treatment - S rated C on a series of personality traits and then interviewed him  
Setting - front row of a classroom; S seated at one end of the row and C seated one to four seats from him. |
| Subject | Source - students from introductory psychology classes  
Method of Selection - not specified  
N (Ss) = 48 (m = 24, f = 24)  
Confederates - paid assistants from an advanced psychology course  
N (C) = 6 (m = 3, f = 3) |
| Variable and Measurement | Independent Variable - distance between S and C: one to four seats x 2 feet  
Dependent Variable - initial impression of C rated by S (the rating was actually completed before the beginning of the interview). Rated dimension -- friendliness, aggressiveness, extraversion, dominance, presented on seven point scales. (Computing of rating on those dimensions used as an index for social activity). |
| Method of Analysis | Analyses of variance for distance, sex of Cs, and rated traits |
| Results | (1) Hypothesis confirmed. (2) Hypothesis partially confirmed -- the highest or most socially active subject ratings occurred when the distance between C and S was 4 feet (at 2 feet and 6 feet the rating was approximately equal) and the most distant position, 8 feet obtained a consistently lower rating. |
Significance and Strength

F = 3.06  df = 3/28  p < .05

Critique
- no indication of method of selection
- the setting of the experiment, in which the empty chairs standing between C. and S may have magnified the distance between them and, consequently, affected ratings in a way not taken into account by the experimenters.

Cross References
Rosenfeld (1965)
Name | Pellegrine and Enpey, 1970  
---|---  
Hypothesis | The issue studied was the relationship between sex, interpersonal proximity, and angle of regard  
Experimental Methodology | Type - lab experiment interview-like situations  
| Numbers of Ss for each intervention - 1 plus decoy (L)  
| Number of treatments for each S - 1  
| Setting - a lab room, where a "listener" (L) of the same sex already seated in one corner of the room and the only other chair available located about 18' from L  
| Method - S was instructed to "pull up a chair: and to describe himself to L  
| Task Environment - S: structure without restraints on medium of communication, L: structure and restricted to visual communication only  
Subject | Source - students in introductory psychology classes  
| Method of Selection - not specified  
| N (Ss) = 60 (m = 30, f = 30)  
| Ls - 2 hired assistants  
Variable and Measurement | Independent Variable - (1) task which demands verbal interaction (2) L's, S's - sex  
| Dependent Variable - measures of (1) proximity -- the distance of S's chair from L's chair, (2) angular displacement -- the angle of S's chair relating to L's chair  
Method of Analysis | Applied t test for the sex x measures relations. Correlation x measures for both sexes.  
Results | (1) Significant negative correlations were obtained between the measures of distance and angular displacement for both sexes.  
| (2) The mean angular displacement score for females was greater than for males.  
| (3) Female Ss seated themselves significantly closer to female Ls than did males to male Ls.  
Significance and Strength | (1) p < .02, (2) t = 2.29, df = 59, p < .05,  
| (3) t = 3.23, df = 58, p < .05  
(cont)
Critique  
- no indication about the selection method  
- only same sex subjects were studied  
- the intimate content of the test might influence the results more than the simple relationship between distance seating angle x sex

Cross References  
Sommer (1959), Argyle and Dean — affiliation conflict theory (1965)
Rosenfeld, 1965

Interpersonal proximity is used as instrumental affiliative act

**Experimental Methodology**

- **Type** - laboratory experiment
- **Number of Ss for each intervention** - 1 plus 1 confederate
- **Number of treatments for each S** - 1
- **Method** - Ss were randomly assigned to approval-seeking or approval-avoiding roles. E then handed a chair to Ss and led them to an empty room, except for one chair already occupied by a confederate (C).
- **Type of treatment** - (1) Approval-seeking condition: S instructed to try to appear friendly to C and to try to get C to like her. (2) Approval-avoiding condition: S were instructed to try to appear unfriendly to C
- **Spatial Arrangements** - non-structural (free placement of chairs)
- **Medium of Communication** - S free to use any chair, C structured: trained to attend visually to S and to respond briefly and naturally to social acts initiated by S and not to initiate verbal or gestural activity herself.

**Source** - female students enrolled in introductory psychology classes

**Method of Selection** - not specified

**N = 18**

**Confederates** - 1 female

**Independent Variable** - attitude: approval-seeking, approval-avoiding

**Dependent Variable** - proximity: (1) the distance of S's chair from C's chair, (2) the angle of S's chair related to C's chair.

**Method of Analysis**

1. Recording of distances between S's and C's chair
2. Application of t test

**Results**

Partly confirmed the hypothesis (1) Distances between chairs (plus), (2) Angle of placement (minus)

**Significance and Strength**

1. $t = 2.62$, $df = 16$, $p < .02$

(continues)
Critique
- the sample is small and not representative
- the findings are not generalizable to dyads consisting of male-male and female-male (Ss and C were females)
- the measure of distance refers to the initial distance and there was no control on changing positions during the three minute session (no follow-up of compensatory behaviour)
- the confederate was aware of the purpose of the study hence possibly biasing the behaviour in a non-experimental direction.
Sommer, 1959. Exp. 3.

The issue studied was how schizophrenic and nonschizophrenic mental patients arrange themselves when they are required to interact.

Type - task-oriented discussion groups
Number of Ss for each intervention - 2
Number of treatments for each S - 1
Method - pairs of the same sex Ss were asked to sit at a rectangular table with eight chairs and to discuss a given topic

Source - schizophrenic patients
Method of selection - reasonably cooperative patients
N (Ss) = 26 pairs

Control Group - non-schizophrenic mental patients tested under the same conditions
N (control) = 11 pairs

Independent Variable - task: verbal interaction
Dependent Variable - seating arrangement: opposites, corner, side-by-side, distance sitting

Comparing the seating patterns of Ss to the control group

Non-schizophrenic similar to normal group in their use of the corner position.
Schizophrenics use mostly the distance arrangement. (However, they hardly talk at all).

(1) p < .05 (2) p < .05

- no validation: the schizophrenic Ss did not really interact, as the author stated "they seem to lack both direction and interest".
- Schizophrenic Ss sample is not representative: the experimenter was choosing from a population of "reasonably cooperative patients"
- some of the Ss were used in previous experiments which might have biased their behavior to the present study.
Name: Sommer, 1959. Exp. 4.

Hypothesis: Seating arrangements of normal and schizophrenics in regard to a decoy of different sex

Experimental Methodology:
- **Type**: participant-experiment
- **Number of Ss for each intervention**: 1 plus decoy
- **Number of treatments for each S**: not constant (many Ss were used more than once)
- **Task Environment**: structured
- **Method**: S was asked to enter a room and discuss a given topic with a seated decoy
- **Seating arrangement**: 1:3:1:3

```
  e - d - c - b - a  
    f - g - h    
```

- **Type of treatment**: (1) decoy at B, (2) decoy at C, (3) decoy at D with no corner chair (A)

Subject:
- **Source**: (1) heterogeneous group of hospital employees and visitors, (2) schizophrenic patients
- **Method of selection**: not specified
- **N (Ss)**: not specified
- **Decoys**: staff members and members of the research department
- **N (decoy)**: not specified

Variable and Measurement:
- **Independent Variable**: (1) sex of the decoy, (2) sex of S, (3) Ss - normal or schizophrenic
- **Dependent Variable**: seating arrangement

Method of Analysis:
- **Recording of the seating arrangement**

Results:
- Significant differences in seating arrangements in regard to all independent variables: (1) normal males were more inclined to sit both across male and female decoys, (2) normal females prefer sitting alongside female decoys and also show greater preference to sit alongside male decoy than do males, (3) schizophrenics of both sex prefer the alongside seating

(cont)
Critique

- there is no indication about the matter of selecting Ss
- no control on previous acquaintance between Ss and decoys in which case the decoy status might have a significant impact
- essential information about size of samples are not reported
- schizophrenic Ss were used more than once.
Name: Willis, 1966

Hypothesis: The purpose of the study was to describe standing-speaking distance at the initiation of natural interaction. Hypothesis suggested: initial distance is a function of speaker's sex, age, race and their interpersonal relationship with a listener.

Experimental Methodology:
- **Type** - participant observation
- **Number of Ss for each intervention** - 1 + E
- **Number of treatments for each S** - 1
- **Method** - E (listener) was instructed to obtain initial speaking distance when approached by anyone who began a conversation (speaker).
- **Task Environment** - non-structured, setting and content of conversation were ignored in the study.

Subject:
- **Source** - not specified
- **Method of Selection** - an incidental sample obtained in homes, business areas and the university campus
- **N (Ss)** - 755
- **E** - 40 university students

Variable and Measurement:
- **Independent Variable** - (1) Es sex, (2) Ss sex, age, race (3) Interpersonal relationship between S and E (i.e., stranger, acquaintance, friend, close friend)
- **Dependent Variable** - Initial speaking distance - the nose-to-nose distance between S and E

Method of Analysis: Analysis of variance of sex, age, race, groups of speakers and listeners, relationship x distances

Results: Initial speaking distances have been found to be a function of (1) sex of E (listener) -- Ss of both sexes stand closer to E female than to E male, (2) Relationships -- strangers stand farther from each other than acquaintances, (3) Sex of E x relationship, (4) Age x relationship, (5) Race -- both blacks and caucasians tend to stand farther from blacks than they do from caucasians.

Significance and Strength:
- (1) F = 10.31, p < .01
- (2) F = 4.30, p < .05
- (3) F = 6.90, p < .01
- (4) n.s.
- (5) V = 20.5, p = .10.

(cont)
Critique

- It is difficult to refer to this study as an experimental study, since there were no controls upon the sample population.
- There is no control on the setting nor on the design.
- The findings are not generalizable, all Es were university students.
- There is no information or control about the breakdown of the sizes of categories representing interpersonal relationships in this study.
- Generally it is more a casual observation or explorative study than a systematic one.

C. General Critique and Applications

Analysis of the studies indicates some critical weaknesses in experimental methodologies, and the need for more extensive field and laboratory studies. In particular, the sizes and method of samples selections indicate that many of these studies can be considered only as pilot studies. The populations from which samples were selected often limit the generality of implications. Another critical shortcoming in many of the methodologies employed is the mode of post-experimental interpretation. Instead of stating before the experiment what the hypothesis was and designing appropriate controls, most studies came to the hypothesis as an interpretation of an observed pattern of behaviour. However, the correspondence of results between many of the studies lend some support to the conceptual framework outlined in this chapter.

Implicit in many of the studies discussed is the assumption that there exists for any given situation an optimal spatial arrangement. This arrangement is, of course, dependent on the relationship between the individuals and on the setting. One must be cautious, however, in interpreting such findings because of the influence of confounding variables in studies and social interaction. It is possible to predict approach tendencies with some success by knowing the relationship between individuals, the social setting, and the cultural background. However, personality variables seem to influence proximity more than attitude concordance or discordance by itself. Furthermore, little research has been done on individual preferences for interaction distances as a function of previous experience. Frequent exposure to intimate approaches
may bring an adaptation to such situations and alter a person's conception of a comfortable interaction distance.

An underlying assumption of all of the studies of space in social interaction is that the interacting individuals have an ability to estimate proximity, yet no one has investigated the limits of such an ability. It might be expected that systematic errors in distance estimation would result as a function of the variables that affect approach tendencies. Thus, estimates of distance might be dependent not only on the actual interpersonal spatial separation, but also on subjective preferences, as is shown, in studies by Porter and Argyle and Salter (1970) Luft (1966).

A conceptual framework was developed focusing on the factors affecting the definition of personal-space and the role personal-space plays in determining spatial arrangements in interactive situations and in the shaping of their emotional climate. It was pointed out that the empirical evidence gathered so far about the particular relationships of spatial configuration, emotional climate and attitude, is not sufficient to establish a general explanatory model. However, it is proposed here that the string of hypotheses described in this chapter may have important implications to the solution of problems of spatial design in interpersonal situations. In the following section some suggested applications of the conceptual framework are explored in the form of design recommendations pertaining to some specific situations. Spatial arrangements condition in part the evolution of a particular
profile of attitudes and the emotional climate of a situation, but are also affected by them. The direction of this process of mutual causality depends on the constraints imposed on changes and adjustments in spatial arrangements. Consequently, it is possible to manipulate in part the nature of interactions by forcing participants into particular positions in the physical space, or using the reactions of adjustments in positional space as indirect measures of attitudes and the emotional climate prevailing in a particular situation. As was indicated in previous sections of this chapter, studies concerning this subject were conducted both with clinically normal and mentally ill subjects. As the definition of personal space and the impact spatial arrangements produce differ between these two populations, these remarks will distinguish between situations involving these two groups.

One important component of the care provided to the mentally ill is the therapy situation. Therapy situations can be classified into two distinct categories: (1) Individual Therapy, and (2) Group Therapy. Individual therapy involves an uneven dyad consisting of the patient and the therapist. Often it is important to minimize the anxiety and discomfort the situation produces for the patient, yet the flow of verbal communication must be encouraged. By manipulating the angular arrangement and the distance between the patient and the therapist, a variety of effects can be created. Minimization of visual contact combined with short interpersonal distance may produce conditions of anxiety reduction without loss of intimacy. Various degrees of "intimacy" can be produced by a change in the angle and the distance between the patient and the therapist. (Beigal 1952) (E.g., a frontal seating arrangement combined
with a long distance between the therapist and patient may produce "formal" relationships when this is indicated by the particular stage of the therapy.) As an instrument of observation, the therapist can elicit from the patient his preferences for spatial positions (e.g., by letting the patient have a choice of seats). The distance and angle of the chosen position vis-a-vis the therapist is an important indicator of the mood and attitude of the patient toward the therapist (Deutsch 1952).

In group therapy, the spatial organization is more complex and important as the therapist manipulates simultaneously the personal space of several patients. The therapist can create intimacy between some and not others; he can condition the response of the group in relation to himself and generate alternative emotional climates ranging from hostility and aggression to passive detachment and formal relations. The creation of alternative emotional climates and the encouragement of coping abilities on the part of the patients is an important element in the therapy process (e.g., the ability to manipulate one's own anxiety). Observation of nonguided and unconstrained movement of the group may provide the therapist with additional tools of evaluating individual preferences and group performance (Winick and Holt, 1961)( Wilmer 1958).

In therapy situations, therefore, the manipulation of interpersonal relative positions may serve to (1) generate "desired" emotional climates and attitudes, (2) provide a monitoring device for the therapist to follow changing moods and social relationships, and (3) provide an additional medium of non-verbal communication which is especially important when other channels of interpersonal communications are noisy or non-existent.
There are also many situations involving the "healthy" in which spatial design and manipulation of interpersonal positions could produce desired emotional climates and interpersonal attitude. Unfortunately, the relevant studies so far available about the healthy are limited to small group interactions and their conclusions can be applied only to very specific situations. We will consider a few examples where these conclusions may apply. These examples include: (1) situations of negotiation, (2) situations of service provision, and (3) classroom situations.

When analyzing situations of negotiation and the use of seating arrangements as a manipulative variable, one must first distinguish between groups with different norms concerning personal space and norms regulating reaction to personal space violation. For example, as Hall indicated, there are cultures (middle Eastern) where minimization of interpersonal distance (physical contact) is imperative to create relationships of mutual confidence while such proximity may violate norms of other cultures (Western). The manipulation of sex composition of negotiating parties and angular positioning may be used to circumvent the antagonism arising from the incompatability of spatial norms. Adjustments of positions may provide a channel of non-verbal communication between negotiating parties, and can provide a cue to the trained observer as to the optimal line to be pursued in order to reach an agreement. On the basis of the series of hypotheses discussed, it is suggested here that the often used frontal positioning of the negotiating parties may contribute to the formal relationship of the negotiation and the relative ineffective-
ness of such situations in producing agreements (as in union-management negotiations). It is not surprising that when members of delegations are allowed some freedom of choosing their positions (e.g., cocktail parties) optimum results are often produced.

The same line of reasoning may apply to service provision relationships (where again many of the studies focus on dyads) especially those situations which require the client to have trust and confidence in the provider(s) of service. Physicians and lawyers, for example, should reconsider the frontal arrangements of seats unless they value detachment from clients (and some situations require it) more than trust relationships. In other situations such as checkout lines in supermarkets, the frontal situation is desired as it induces impersonal relationships conducive to quick service.

Another important situation where spatial arrangement has a manipulative value is the classroom. The teacher, by manipulating the students' seating arrangement and his spatial position can influence the atmosphere of class activities (e.g., creating a more formal or less restrained atmosphere). Seating in straight rows imposes a more disciplined and authoritative environment, while seating in a circle, horse-shoe, or asymmetric arrangement will tend to produce a more casual and free interaction. By choosing positions of individuals, the teacher can affect the creation of inter-relationships among students in his class, and by changing them often avoid formation of cliques. Closer relationships among those seated near each other than among those seated far apart are expected. Allowing students to choose seats freely in the classroom can provide the teacher with a measure of the personal inter-relationship among them and their attitudes toward himself.
There are other secondary implications to the conceptual model of a more speculative nature. The following are some of the more obvious ones:

**Crowding in working places** - One way of resolving, in part, crowding problems in a plant or an office, can be through the manipulation of the distribution of employees by sex. According to the findings, women tend to tolerate more intimate conditions, hence one may confine women more densely when space constraints impose physical proximity. Alternatively, mixing men and women may relieve anxieties created by crowding. The open space design where employees can adjust (even marginally) their positions is another strategy of design.

**Transportation** - The division of space in a plane or any other public transportation facility to smokers and non-smokers may not be the only or even the most desirable one. The social well-being of passengers may increase if seats are divided and positioned according to passengers' desire to interact or preserve privacy. If this factor of design is accepted, it is possible to rearrange and refurbish the vehicle so that it will provide for those who like to interact in an environment which will promote interaction, i.e., small units offering proximity and angular eye contact and preserving the row formation for those who may seek privacy.
CHAPTER III

Spatiality and the Nature of Task

A. Conceptual Background

Many aspects of the proximate environment, including furniture and room dividers, have been placed for ease of maintenance and efficient cleaning with little consideration to their social function. On the other hand, textbooks on group dynamics recommend horseshoe or semi-circular rather than a straight-row arrangement for discussion groups and classrooms. Rectangular tables have been criticized for fostering authoritarian leadership, and the improper location of individuals has been blamed for the failure of working teams. But the data is largely of the anecdotal variety. Group spatial arrangements may vary as a function of the size, intimacy, setting and the nature of the interaction. The explorations of such problems may not only tell us more about the meaning of space, but also may contribute to our understanding of groups and group processes. The more we learn about the dimensions and the dynamics of group interaction, the more we will be able to adopt the methods and techniques that will help us fulfill the specific purpose for which any group is organized. Knowledge of how groups arrange themselves can assist in fostering or discouraging group interaction and determine the nature of the interaction. The broadest treatment of space in small groups has mainly come from R. Sommer's extensive work. Sommer adopted and extended Allport's (1924) original distinction between co-operating, competing, and co-acting groups. Sommer's studies, using these concepts, have attempted to explore the connection between spatial arrangement and group task. His first observational study along these
lines (1959, Exp. 1) took place in a cafeteria, where interaction was
encouraged. The study was purely observational and no specific
hypothesis was formulated. The data of the recorded interaction showed
that people were interacting more with those sitting in neighbouring
chairs. Interaction between people seated corner to corner exceeded
chance expectancy, while interaction between people seated face to face
was less than chance expectancy.

In order to distinguish between the environmental factors (is
corner position sparking the interaction) and the social factors (do
people who desire to interact seat themselves in corner positions)
Sommer designed a second study (1959, Ex. 2) in which he changed the
method from natural observation to active experimentation. The results
were incongruent with the former study. It appeared that when Ss were
instructed to interact verbally, they significantly arranged themselves
more at the corner-to-corner positions compared to any other arrangement.
When a distinction was made between those pairs who were interacting —
conversing or studying together, and those who were co-acting — occupying
the same table but studying separately, (Sommer 1965, Exp. 1.) the results
indicated that the interacting pairs showed a definite preference for
corner-to-corner seating, and to a lesser extent, for opposite seating,
with no use of side-by-side or distant seating. On the other hand, more
than two-thirds of the co-acting groups chose a distant seating arrange­
ment which separated members geographically and visually. The situation
was reversed in a library situation where interaction was discouraged.
The results showed that 30% of the pairs sat across from one another, 15%
sat side-by-side, while 56% used the diagonal or distant arrangement.

In order to learn in what way the group task influences the
way people arrange themselves at a table, a paper-and-pencil test was
administered to 151 students (Sommer 1965, Exp. 2). Each student was
asked to imagine how he and a friend of the same sex would seat them­selves under four different conditons:-

a) Informal cooperation - to chat for a few minutes.

b) Structure cooperation - to study together for the
same exam.

c) Co-acting - to study for different exams.

d) Competing - to compete in order to see which
one would be first.

In each case, the student was asked to indicate his own seating position
and that of his friend's on a diagram showing a rectangular table and
six chairs. The results showed that people who want to converse or work
together use the near arrangements -- side-by-side, corner-to-corner,
and opposite seating, while distant seating was found to be the dominant
pattern in co-acting groups. The most common distant pattern for the
coa-acting groups, showed subjects sitting on opposite sides of the table
but not directly facing one another, rather than the more physically
distant head-foot arrangement. The dominant arrangement for the competing
groups was opposite seating. There was found to be a metaphorical quality
to these arrangements with people competing sitting in "opposition",
people co-operating sitting "on the same side", people conversing sitting
"in a corner" and people co-acting choosing a "distant" arrangement.
To learn how the group task would affect the arrangement of people at a round table, another group of students was asked to fill out questionnaires similar to those of the preceding study except that the diagram showed a round table surrounded by six chairs. The same four situations were described. The results showed that casual and co-operating groups made the greatest use of adjacent chairs, while the majority of the co-acting and the competing groups placed a gap of two seats between themselves which sat them directly opposite or at farther distances from one another.

Children also show environmental preferences. Norum, Russo and Sommer (1967) attempted to learn how children and college students would arrange themselves when asked to perform tasks involving different interpersonal relationships -- co-operative, competitive and co-acting activities. The results indicate once more that the perceived interpersonal task relationship between individuals affects how they arrange themselves spatially, as the results again showed the significant tendency for corner and side-by-side seating in the co-operative condition, opposite seating in the competitive condition and distance arrangement in the co-acting condition. Furthermore, this typical arrangement occurs on a voluntary basis with both preschool children as well as college students, which suggests that the ecological requirements of different tasks are learnt early in life. Sommer extended the previous findings which indicated that people sometimes preferred to sit across from one another (although sometimes at a slight angle) while in some other occasion they show a preference to side-by-side seating arrangement for co-operation or
casual situations. In his studies, Sommer attempted to measure the limits of comfortable conversation distance in different arrangements. He hypothesized that people would prefer to sit across from one another until the distance between them exceeded the limit of comfortable conversation. In a preliminary study (Sommer 1961, Exp. 1), he noted that when the distance between two couches was varied so that the across-distance between the couches was three feet or less, the subjects preferred to sit opposite one another; when the across distance was farther, they sat side-by-side. In the overall situation, the distance for comfortable conversation was assumed to be five and a half feet between people.

In a subsequent study (1962) Sommer used four chairs instead of couches, so that the distance side-by-side as well as the distance across could be varied. The results supported the previous finding that people usually prefer sitting across from one another rather than side-by-side, in the full matrix of distances from one to five feet. However, this preference for sitting opposite was found to be true only when the distance across was equal to or less than the side-by-side distance. The preference for the corner seating in the informal co-operation conditions (Sommer 1959), which is actually an across-arrangement at a slight angle, may reflect a more general preference for interaction angles that permit but do not require visual contact.

Generally speaking, it seems that eye contact serves as an important factor in the group's spatial arrangements. As mentioned in the previous chapter, Goffman (1963), Hall (1964), Birdwhistell (1952) and Argyle & Dean (1965) found that direct visual contact can be exceedingly
uncomfortable and disconcerting under ordinary conditions. This might suggest that the corner seating preserves the closeness between co-operating individuals and still enables them to avoid eye contact since they do not sit face-to-face. The research findings have also shown that the co-acting pairs used the distance across the table for books, handbags, and other belongings which enabled them to avoid visual contact.

Yet other studies claim that eye contact facilitates interaction. Under certain conditions, direct visual contact represents a challenge to the other – as in the competitive condition or as a stimulus for participation in a class study condition. The contradiction can be explained only by assuming that different tasks can tolerate different amounts of eye-contact which in turn demand different spatial arrangement.
### B. Summary Charts of Studies Relating Spatiality and the Nature of the Interaction

<table>
<thead>
<tr>
<th>Name</th>
<th>Sommer 1961, Exp. 3.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis</td>
<td>People will tend to sit across from each other until the distance between them exceeds the limit of comfortable conversation.</td>
</tr>
</tbody>
</table>
| Experimental Methodology | **Type** - task-oriented discussion groups  
**Number of Ss for each intervention** - 2  
**Number of treatments for each S** - 1  
**Experimental design** - two couches were placed at various distances across. Pairs of Ss of the same sex were instructed to enter a room, choose a seating arrangement and discuss a given topic.  
**Medium of Communication** - verbal audio-visual  
**Treatment** - change distances between frontally facing couches |
| Subject | **Source** - non-professional mental hospital employees, visitors to the hospital  
**Method of Selection** - not specified  
N (S) = 158 |
| Variable and Measurement | **Independent Variable** - distances between couches across  
**Dependent Variable** - seating positions |
| Method of Analysis | Frequency tables of seating positions as a function of distances between couches. Identification of threshold distance leading to switch in positions. |
| Results | Confirmed the hypothesis: at 1 to 3 feet Ss sat across. At 3½ to 6 feet, Ss sat side by side. The upper limit of distance for comfortable conversation equals 3½ feet (5½ feet "nose to nose"). |
| Critique | - sample does not represent a definite population  
- sitting together side by side on the same couch implies intimacy, which Ss might try to avoid in spite of the inconvenience of sitting across  
- no control on previous acquaintance between Ss  
- no control on the angle of the face-to-face seating  
- no manipulation of different sexes. |
<table>
<thead>
<tr>
<th>Name</th>
<th>Sommer, 1959. Exp. 1.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis</td>
<td>No specific hypothesis was formulated; the issue studied was seating arrangement and interaction</td>
</tr>
<tr>
<td>Experimental Methodology</td>
<td>Type - natural observation (non-structured)</td>
</tr>
<tr>
<td></td>
<td>Number of Ss for each intervention - 2</td>
</tr>
<tr>
<td></td>
<td>Number of observations for each S - 1</td>
</tr>
<tr>
<td></td>
<td>Setting - dining hall of a large mental hospital</td>
</tr>
<tr>
<td></td>
<td>Method - two observers (O) recorded independently during noon meals verbal interaction which occurred in 5 second periods at various tables in a pre-designated area.</td>
</tr>
<tr>
<td></td>
<td>Seating arrangement - rectangular tables with 1-3-1-3 positions</td>
</tr>
<tr>
<td>Subject</td>
<td>Source - staff members and assorted employees having lunch in the dining hall</td>
</tr>
<tr>
<td></td>
<td>Method of selection - Ss occupied tables in a predesignated area with clear view to Os.</td>
</tr>
<tr>
<td></td>
<td>Number of interactions recorded - 50</td>
</tr>
<tr>
<td>Variable and Measurement</td>
<td>Independent variable - seating arrangement: near chairs - corner to corner, side by side, face to face; distance chairs - chairs separated by at least one chair</td>
</tr>
<tr>
<td></td>
<td>Dependent variable - verbal interaction</td>
</tr>
<tr>
<td>Method of Analysis</td>
<td>Observed frequency of arrangement based on the average for the two Os</td>
</tr>
<tr>
<td>Results</td>
<td>Ss interacted more with those sitting in the near chairs</td>
</tr>
<tr>
<td>Significance and Strength</td>
<td>$\chi^2 = 19.1 \ p &lt; .01$</td>
</tr>
<tr>
<td>Critique</td>
<td>- no control on previous acquaintance between Ss; possible that the intimacy of the relationship between Ss determined their choice of seats more than their desire to interact</td>
</tr>
<tr>
<td></td>
<td>- no control on sex and status differences</td>
</tr>
<tr>
<td><strong>Name</strong></td>
<td>Sommer 1959, Exp. 2.</td>
</tr>
<tr>
<td>----------</td>
<td>----------------------</td>
</tr>
<tr>
<td><strong>Hypothesis</strong></td>
<td>No specific hypothesis was formulated. The issue studied was how people arrange themselves when they desire to interact.</td>
</tr>
</tbody>
</table>
| **Experimental Methodology** | Type - task-oriented discussion group  
Number of Ss for each intervention - 2  
Number of treatments for each S - 1  
Method - pairs of the same sex were asked to sit at a table and discuss a given topic  
Type of Treatments - (1) rectangular table with 8 chairs, (2) rectangular table with 4 chairs, (3) square table with 4 chairs, (4) rectangular table with 8 chairs |
| **Subject** | Source - assorted employees in a mental hospital  
Method of Selection - not specified  
(1) N = 6 pairs  
(2) N = 10 pairs  
(3) N = 9 pairs  
(4) N = 11 groups of 3 Ss |
| **Variable and Measurement** | Independent Variable - task-verbal interaction  
Dependent Variable - seating arrangements in different settings |
| **Method of Analysis** | Observed frequency of arrangement |
| **Results** | Ss arranged themselves corner-to-corner more significantly than any other arrangement |
| **Significance and Strength** | p < .01 |
| **Critique** | - no control on previous acquaintance between Ss. |
Name: Sommer 1962

Hypothesis: People will sit across from one another rather than side-by-side

Experimental Methodology:
Type - task-oriented
Purpose of the Study - to extend previous study (Sommer 1961) and learn the effect of varying the side-by-side distances in addition to the across distances
Number of Ss for each intervention - 2
Number of treatments for each S - 1
Method - pairs of Ss of same sex were instructed to go to a designated area containing four chairs and discuss a given topic

Subject:
Source - student nurses and teenage visitors
Method of Selection - not specified
N (S) = 182 (m = 38, f = 144)

Variable and Measurement:
Independent Variable - distances between chairs
Dependent Variable - seating position
Measurement of Distances - 5 x 5 matrix of all side-by-side and across distances from one to five feet

Method of Analysis:
χ² test - side-by-side, across seating arrangement frequencies

Results:
Confirmed the hypothesis only when: (1) distances across < distances side by side, (2) distance across = distance side by side

Significance and Strength:
(1) χ² = 32.11 p < .001 (2) χ² = 8.89 p < .01

Critique:
- the sample does not represent any definite population
- no random selection
- the size of the room (46' x 48') may influence the way Ss perceive the appropriate distance
- no control on the environment (the surrounding area)
- the hypothesis was not tested under different conditions of intimacy
- no control on previous acquaintance between Ss
- no manipulation of different sexes

Cross References: Sommer (1961)
Name: Sommer, 1965. Exp. 1.

Hypothesis: The effect of task on seating arrangement:
1. in groups whose members are presumed to have a strong desire to interact (cafeteria),
2. in groups whose members want to remain apart (library)

Experimental Methodology:
- **Type**: observation study
- **Number of Ss for each intervention**: 2
- **Number of treatments for each S**: 1
- **Task Environment**: non-structured
- **Experimental Method**: observation of two environments: (1) cafeteria: a. without distinction of the major activities, b. with distinction of the major activities. (2) library
- **Seating arrangements observed**:
  - Cafeteria
  - Library

Subject:
- **Source**: (1) students
- **Method of Selection**: pairs occupying the same table, not eating
  - aN(S) = 110 pairs (table 1 = 50, table 2 = 60)
  - bN(S) = 216 pairs (table 1 = 124, table 2 = 92)
- **Source**: (2) students
- **Method of Selection**: pairs occupying the same table in randomly selected areas
  - N(S) = 496 (M = 192, f = 304)

Variable and Measurement:
- **Independent Variable**: (1) task-environment which encourages interaction (cafeteria), (2) task-environment which discourages interaction (library)
- **Dependent Variable**: seating arrangement
- **Definition of Major activities**: (1) interacting: conversing, studying together (2) co-acting: studying separately

Method of Analysis: Calculation of the percentage frequency of seating arrangement

Results:
1. **Cafeteria** - in condition a. 70% chose the corner position in the square table and 40% chose the corner position in the rectangular table. In condition b. square table: 66% of the interacting pairs chose the corner position and 90% of the co-acting pair chose the opposite position; rectangular table: 54% of the interacting pairs chose the corner position and 68% of the co-acting chose a diagonal seating arrangement which separated them geographically and physically.
2. **Library** - 56% of Ss chose a diagonal distance seating arrangement

(cont)
Critique

- no validation of the assumption that in the cafeteria people are more motivated to interact
- no control on the population source and on the sample; it is possible that Ss appeared in the sample more than once
- no control on the nature of the interaction and previous acquaintance between Ss
- no control on sex differences within and between pairs
Name: Sommer, 1965. Exp. 2.

Hypothesis: Group task will affect the seating arrangement

Experimental Methodology:
- **Type**: paper and pencil test questionnaire
- **Number of Ss for each intervention**: 1
- **Number of treatments for each S**: 1
- **Type of treatment**: (1) S was asked to indicate on a diagram showing a rectangular table (with 1-2×1-2 arrangement) how he and his friend of the same sex would seat themselves under four conditions: a. conversing, b. studying together, c. studying separately, d. competing. (2) the same as above except that the diagram showed a round table.

Subject:
- **Source**: students in an introductory psychology class
- **Method of Selection**: not specified
  - (1) N (s) = 151
  - (2) N (S) = 116

Variable and Measurement:
- **Independent Variable**: group task
- **Dependent Variable**: seating arrangement

Method of Analysis:
- Percentages of frequency for choosing different arrangements

Results:
- Confirmed the hypothesis. Ss chose different arrangements for different tasks in both the rectangular and round tables.

Critique:
- Sample not generalizable
- No pilot or follow-up study to test the validity of the method used (questionnaire)
No specific hypothesis was formulated. The issue studied was how children would arrange themselves when instructed to perform tasks involving different interpersonal relationships.

**Experimental Methodology**
- **Type** - task oriented group
- **Number of Ss for each intervention**
  - (1) - 2
  - (2) - 2
- **Number of treatments for each S**
  - (1) - 3
  - (2) - 1
- **Setting** - large room containing a table surrounded by 6 chairs
- **Type of Treatments**
  - (a) co-acting - 2 Ss at a time were asked to enter the room, sit down and work separately with blocks.
  - (b) Co-operating - pairs were asked to work together.
  - (c) Competition - Ss were told to contest in order to see whose performance would be the best.
- **Task Environment** - structure with motivational reinforcement.

**Subject**
- **Source**
  - (1) children enrolled at a local preschool
    - (1) N(s) = 16
  - (2) children from grades 4-6 (ages 9-12) attending a local public school
    - (2) N(s) = 74 like sex pairs

**Variable and Measurement**
- **Independent Variable** - group's task
- **Dependent Variable** - seating arrangement

**Method of Analysis**
- Arbitrary rank order for 1 to 4 were assigned to the different arrangements in terms of psychological closeness

**Results**
- Significant linear relationship in both preschool and public school children between the task and the closeness of the seating arrangement

**Significance and Strength**
- p < .01
<table>
<thead>
<tr>
<th>Name</th>
<th>Norum and Russo and Sommer, 1967. Exp. 2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis</td>
<td>The issue studied was how the perceived task relationship between S and a decoy already seated would affect S's choice of seating.</td>
</tr>
</tbody>
</table>
| Experimental Methodology | Type - participant experiment  
Number of Ss for each intervention - 1 plus decoy  
Number of treatments for each S - 1  
Setting - large room containing a large rectangular table with 1-4-1-4 chairs arrangement, the decoy always occupied the same chair (1 from the end along the side of the table)  
Type of treatment - Ss were instructed to - (1) compete (2) cooperate with the decoy of the same sex already seated in the room  
Task Environment - structure |
| Subject | Source - students in introductory psychology classes  
Method of Selection - not specified  
N (S) = 47 (m = 20, f = 27)  
Decoys - volunteers from Ss classes |
| Variable and Measurement | Independent Variable - group's task  
Dependent Variable - seating arrangement |
| Method of Analysis | Recording of the seating arrangement |
| Results | (1) competing - significantly preferred opposite arrangement. (2) cooperating - significantly preferred side by side arrangement. |
| Significance and Strength | $\chi^2 = 6.88$ p < .01 |
| Critique | sample not generalizable  
- no control on the degree of acquaintance between S and the decoy  
- the permanent seating position of the decoy (1 chair from the end) eliminates the possibility of a corner arrangement. |
C. General Critique and Application

The studies reviewed in this chapter attempted to show how different kinds of group's tasks (e.g., casual, co-operation, co-acting, competing) are associated with different seating arrangements. Since in almost any group situation the group's task is a given factor, to a great extent the appropriate spatial arrangement can provide the adequate environment to fulfill those pre-determined tasks. Stated more simply, knowledge of the optimum arrangements for different tasks might provide us with an important device for designing and manipulating the environment in order to get the best possible performance from participants.

In spite of the importance and relevance of this aspect of spatial arrangement to many design problems, this research area attracts few researchers. The methodologies applicable can be classified into small group experiments and observational studies. Observational studies often suffer from lack of sufficient controls and extensive use of intuitive interpretation and subjective recording of data. However, this class of studies is conducted in a "natural" setting uninhibited by the experimenter. In contrast, small group experiments are biased by the artificial surroundings of the laboratory but allow for more stringent experimental designs. These trade-offs between methodological purity and "realism" can be resolved by testing the findings of both methodologies and comparing the results. Unfortunately no small group experiments were
conducted to confirm the results of the observational studies. Another important shortcoming of the studies lies in their focus upon interactions among dyads rather than groups, hence the results can be considered only marginally applicable to the group-based attitude and climate studies discussed in the previous chapter.

The quest for effective spatial arrangements in different groups and units such as teams in assembly lines, seminars, and unstructured discussion groups which require different types of interaction, are undoubtedly important. Intuitively it would seem that the proper arrangement of people would increase production, smooth the flow of communication, and reduce the "friction space". The results indicate that different tasks are associated with different spatial arrangements. The ecology of cooperation differ from the ecology of co-action and competition. Exactly why these particular arrangements are chosen we do not know for certain yet. Thus, we can only speculate or make suggestions based on the findings which attributed attitudes and emotional climates to different spatial arrangements show. Some tasks predetermine particular attitudes and may produce with high probability some given emotional climates. For such tasks, particularly when visual contact is an important factor, the hypothesis examined so far may be used for explaining the role of spatial arrangement in determining task-performance. Understanding of the effects of spatial arrangement upon task performance is an important basis for functional spatial design. In a library, for example, which is intended to be a sociofugal space aimed at discouraging interaction, an arrangement of seating space that minimizes unwanted
contact is desired. According to the findings, in order to achieve this aim, one has to use an environment and furniture which insures maximal interpersonal distance but, more importantly, an arrangement which conceals eye contact. On the other hand, for cases that require high level of interaction and a greater extent of participation by members of the group (e.g., group discussion) one has to provide a sociopetal space environment which promotes social interaction by means of more compact arrangements and provision of greater access of each member to the other.

In assembly line teams when the task requires co-operation among the members, it is recommended the people be positioned within a short distance configuration: side-by-side or face to face, without obstacles for eye contact. On the other hand, when the task involves a high level of concentration by the individual it is best to isolate individuals by locating them at a farther distance from each other and by using means to avoid eye contact which will result in the elimination of interaction. However, one has to be aware that those means of isolation may contribute to the efficiency of performance, but not necessarily to the personal satisfaction with the task, which may, in the long run, also affect performance. Therefore, in order to achieve an optimum equilibrium between task performance and personal satisfaction, one has to be rather cautious in using spatial arrangement and only repeated studies addressed to this problem will increase the reliability of manipulating spatial designs to increase productivity.

Another important example is the arrangement of seats in a classroom. Traditionally, the style of the fixed-row classroom was
associated with an authoritative style of education, as it reduced interaction and communication between people in the rows by focusing their attention on the front of the room. Such an outcome was desirable from the standpoint of a "sit-and-learn" philosophy. As early as 1900, J. Dewey criticized the fixed-row arrangement as antagonistic to the philosophy of experimentalism. More recently, various experiments such as the "open area" design aimed at a more participatory mode of learning were conducted successfully. However, Sanders (1968) in his study which emphasized the role of educational philosophy in determining the usage of the classroom layout, found that teachers and administrators are remarkably insensitive to the connection between the physical environment and educational program, rarely making use of new spatial arrangements and often resisting the departure from a fixed-row arrangement. This showed again that even educators who have an obligation to learn the connection between the classroom layout of spatial arrangements and the learning process, conceived the physical environment (i.e., spatial arrangement) as a given rather than as a source of parameters that could be manipulated to encourage student participation.
CHAPTER IV

COMMUNICATION PATTERNS AND SPATIALITY

A. Conceptual Background

When the nature of a task is such that it must be performed by a group rather than by a single individual, the problem of interaction relationships arises. One of the more important of these relationships is that of communication. As was demonstrated in the previous chapter, the successful completion of most, if not all, tasks requires an effective flow of information. On what principles may a pattern of communication be determined? This is a rather controversial issue.

Administrative thinking on this point commonly rests upon the assumption that optimum patterns of communication for a task-group may be derived from the specifications of the task to be performed. Bavelas (1950) however pointed out that task groups (even if one considers only communications relevant to the task being done) invariably tend to depart from formal statements of the pattern. Bavelas suggested that this departure is due to the tendency of groups to adjust toward that type of communication pattern that will permit the easiest and most satisfying flow of ideas, information, decisions, etc. Furthermore, according to Bavelas, in groups that are free of outside direction and control, the interaction patterns that emerge and stabilize are a product of social processes within the group.

If we consider a task-group in terms of who can communicate with whom, without regard for the nature of the task, certain basic questions about how a communication pattern may affect the nature and
behaviour of a group can be raised:

1. Do some patterns of communication have structural properties that limit or improve group performance?

2. What effects can patterns of communication, as such, have upon the emergence of leadership, the development of organization, and the general satisfaction of group members?

In regard to the first question - patterns vis-a-vis performance on a group level - Heise and Miller (1951) investigate the relationship between group performance communication patterns and type of task. In their experiment, the performance of a three-man group was studied for five different communication patterns and three kinds of tasks. The results indicated that the performance of a small task-oriented group depends upon the channels of communication open to its members and its task. However, the nature of the group's task which demands either cooperation, coordination or coacting was found to be the most important variable in determining the group level of performance in any given communication pattern.

With regard to the second question - individual behaviour - there are some possible effects of various patterns of the performance of individuals. The problem becomes one of analyzing the forces operating on an individual in any particular position in a communication pattern, and then predicting how the effects of these forces will be translated into behaviour.

The issue of the individual's position in the communication network has been mainly investigated by Bavelas (1948, 1950), Steinzor
(1950) and Leavitt (1951). They have analyzed group process in terms of intragroup communication networks or communication patterns. Among other results it was shown that the way in which communication patterns in a group vary so as to facilitate problem solving is actually a function of the ease with which a group member is able to communicate with all other group members. Ease of communication was operationally defined by two related indices, "centrality" and "peripheriality", which in turn were derived from "distance" - the least number of intermediary communicative links a communicator would have to utilize in order to reach every other communicator in the group.

"Centrality" reflects the extent to which one is strategically located, relative to other positions in the pattern. Centrality, therefore, is a measure of one's closeness to all other group members and hence is a measure of the availability of the information, or communication-access.

Communication access affects behaviour by determining one's role in the group. This is true in particular when information is necessary for the solution of the problem. An individual who can rapidly collect information should see himself and be seen by others in a different way from a "peripherial" individual to whom vital information is not accessible. Such roles should be different in the extent to which they permit independence of action, the monotony they impose, and the responsibility they entail.

The computation of centrality, peripheriality, and distance is illustrated in Leavitt's paper which is perhaps the best documented study of
the importance of an individual's position in the communication network. Leavitt (1951) hypothesized that communication pattern will effect the group performance and that spatial location in all patterns will determine behaviour and will produce differences in activity, satisfaction degree, and leadership status. He tested the hypothesis in his study of twenty task groups consisting of five subjects who were seated at a table separated from one another by vertical partitions communicating through different patterns. Four patterns were used in this study: the wheel, the Y shape, the chain and the circle (see fig. no. 1.).

![Diagram of communication patterns]

(Wheel) (Y) (Chain) (Circle)

(Fig. No. 1.)

The results show that:

1. The wheel operated in the same way in all five cases. The peripheral men funneled information to the centre, where an answer or decision was formulated and sent out.

2. The Y operated so as to give the most central position C, complete decision-making authority. The next most central position served only as a transmitter of information and answers.
3. The chain operated so that information was usually funneled in, from both ends to C, and hence the answer was sent out in both directions.

4. The circle showed no consistent operational organization. Most commonly, messages were just sent in both directions until any S received an answer or worked one out.

The results showed that the communication patterns affected the group behaviour as a whole and at the individual level. The major behavioural differences attributable to communication patterns were differences in accuracy and speed of problem solving, total activity, satisfaction of group members, emergence of a leader, and operational organization of the group.

One's position in the group affected the chances of becoming a leader of the group, one's satisfaction with one's job and with the group, and the quantity of one's activity. Centrality was found to be the most significant characteristic of communication patterns which was correlated with behavioural differences.

Many experiments over the past twenty years have replicated Leavitt's findings that an explicit communication network has a direct influence on the pattern frequency and intensity of communications. However, Steinzor was the first one to systematically show that communication networks are also implicit in the seating arrangements of discussion groups. While he was doing a study on other aspects of group dynamics, Steinzor (1950) noted some unusual spatial effects on the relationship between verbal interaction and the relative positions of the members. He hypothesized that, in a small group seated in a circle, the
greater the seating distance between two people the greater the chances are that they will follow one another verbally. In an ex-post facto design, using data already collected on the two groups that had met over a period of weeks in a series of sessions, Steinzor verified this hypothesis. He found that within a circular arrangement of people when one person finished speaking it was the person directly opposite him who tended to speak next. The data was quantified by recording the number of times participants followed each other verbally when they were removed from each other by five, four, three, two and one seats. The results were statistically significant in the expected direction. The farther a participant was from a speaker, the more likely he was to make a verbal comment when the speaker finished. Steinzor attributed this effect to the fact that the "greater physical and expressive stimulus value a member of a group has for others, the more nearly opposite he sits from one in a circle" (p. 554). Festinger, Schacter and Back (1950) found too that communication among individuals tends to be maximized between individuals positioned opposite to one another, and conversely, that there is less communication between people placed side by side.

Hearn (1957) continued the investigation of what he termed the "Steinzor effect" (p. 272), although his study was conducted under somewhat different conditions in size and seating arrangements, so it cannot be regarded as a definitive test. In Hearn's study, subjects were assigned to one of two groups, the first with a designated leader, and the second with no pre-established leaders. The subjects participated in eight weekly sessions seated in a U shape arrangement, in which all the members occupied the same seats for all the sessions. Hearn used
Bales' (1950) categories to code the interaction, but whereas Steinzor had recorded Who follows whom in an interaction sequence, Hearn noted to whom a comment was directed. Data with respect to the leaderless groups gives strong support to Steinzor's hypothesis. Interaction was found to be more frequent between the more opposite seats at the two and three seats interval, than at the one seat interval. However, the situation in the "leader dominated" groups was just the opposite. Communication flow was generally side-by-side rather than across the table. There was more interaction at the one seat interval than at any other. Since the two groups had been assigned randomly, it seems valid to assume that the principal difference between the two groups was the manner in which they were led.

Hearn's results added a new dimension to the complex of communication vis-a-vis the group's spatial structure. It suggests a further hypothesis to the effect that the manifestation of the Steinzor effect will depend upon the degree of direction given by a designated leader. That is, the effect will be most strongly manifested in a group with no designated leader; it will tend to disappear in groups where group direction is shared about equally by the members and the designated leader, and it will be reversed in a situation where the designated leader gives very strong direction. This suggests that the stimulus value of oppositeness is conditioned by the group style of operation.

Hare and Bales (1963) studied the interaction pattern in five-man groups sitting around a rectangular table, over a series of five meetings, with a variety of discussion tasks. The data was compared with a prediction based on Steinzor's hypothesis that individuals would talk
most to those most "opposite" to them. The study failed to find any significant direction with respect to "oppositeness".

In addition, Hare and Bales' study included a personality measure of Dominance - which was a prior paper and pencil measure of a subjects' tendency to talk for longer periods of time in a group. It showed that subjects who were high in dominance showed a significant tendency to choose the most central seats (that renders him most accessible to interaction with others), and did most of the talking. Furthermore, they also tended to be talked to more by other group members. Subjects at the corner positions gave and received less inter­action. When the authors combined the hypothesis that some positions are more central in the communication network and the hypothesis based on the work of Steinzor (that group members will talk more to persons who sit opposite them than to persons who sit next to them) they did find that the interaction rates tended to reflect a constant pattern of communication.

Thus the central-member-plus-oppositeness hypothesis appeared to be superior to the simple oppositeness hypothesis.
B. Summary Charts of Studies Relating Communication Patterns and Spatiality.

<table>
<thead>
<tr>
<th>Name</th>
<th>Heise and Miller, 1951</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis</td>
<td>The relationship between group performance, network of communication, and type of task.</td>
</tr>
<tr>
<td>Experimental Methodology</td>
<td>Type - lab experiment task-oriented group</td>
</tr>
<tr>
<td>Number of Ss for each intervention</td>
<td>3</td>
</tr>
<tr>
<td>Number of treatments for each S</td>
<td>5 x 2 sessions</td>
</tr>
<tr>
<td>Method</td>
<td>Ss were located in three adjacent rooms each S had a microphone, amplifier, and earphones. Each S required to reach a solution to a problem of which the necessary information was divided equally among Ss. There were three kinds of problems: (1) simple reassembling of a list of standard words (rigidly structured communication) (2) constructing a sentence, the words of which had been distributed among Ss (less structured communication) (3) required the group to form anagrams (non-structured communication)</td>
</tr>
<tr>
<td>Medium of Communication</td>
<td>verbal messages</td>
</tr>
<tr>
<td>Type of treatments</td>
<td>communication through 5 networks</td>
</tr>
<tr>
<td>Subject</td>
<td>Source - 3 undergraduate students who mastered a list of 256 common nonsyllables in previous experiments</td>
</tr>
<tr>
<td>Variable and Measurement</td>
<td>Independent Variable - (1) networks (patterns of communication) (2) group's task</td>
</tr>
<tr>
<td>Dependent Variable</td>
<td>group performance - efficiency</td>
</tr>
<tr>
<td>Method of Analysis</td>
<td>Observational recording of data</td>
</tr>
<tr>
<td>Results</td>
<td>The relative efficiency of a communication network depends upon the task: the nature of the group's task was found to be the most important variable in determining its level of performance in a given communication network. Problem (1) dependent upon accessibility to information of every member (rank order of efficiency: 1,2,3,4,5,) Problem (2) placed a high premium on the coordination of the group activities (rank order efficiency: 3,2,1,4,5,)</td>
</tr>
</tbody>
</table>

![Diagram of communication networks](image_url)
Problem (3) in which communication was not essential to carrying out the task there were no differences among the nets.

Critique
- the sample is too small for generalization

Cross References
Leavitt (1951)
Hypothesis

(1) Ss would talk most to those farthest away and in decreasing amount to persons less far. (2) Some positions are more "high talking". S in any given position will talk most to members in those positions. (3) Ss with higher tendency to talk in a group will prefer the more high-talking positions. (4) When seats are equal in "talking level" S will talk most to the person farther away.

Experimental Methodology

Type - task-oriented discussion group
Number of Ss for each intervention - 5
Number of treatments for each S - 1
Types of treatments - Ss were given a battery of personality tests and were observed at a series of three meetings
Seating arrangement - the five members freely seated on three sides of a rectangular table (maintaining 1-3-1 seating arrangement)

Subject

Source - sample of Harvard undergraduate students
Method of Selection - not specified
N (S) = 60

Variable and Measurement

Independent Variable - (1) Seating positions - distance, "high talking" (centrality)
(2) Dominance
Dependent Variable - (1) frequency of verbal remarks
(2) preference for choosing a different position
Dominance - prior paper and pencil measure of S's tendency for extensive talk in a group

Method of Analysis

Bales' category system of record was used. The expected rank for each position, and the observed interaction data were rank-summed for each group and correlated with the hypothetical patterns.

Results

(1) Did not confirm the hypothesis. (2) Confirmed the hypothesis: Ss in seats 1,3, & 1 give and received more interaction (3) Confirmed the hypothesis: Ss high in dominance chose the "high talking" seats (1,3, & 1) (4) Confirmed the hypothesis.

(cont)
<table>
<thead>
<tr>
<th>Significance and Strength</th>
<th>(2) $r = .37 \ p &lt; .05$</th>
<th>(3) $r = .30 \ p &lt; .05$</th>
<th>(4) $r = .47 \ p &lt; .01$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critique</td>
<td>- used post hoc data collected for other purposes to examine the positional effects</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- no control on the angle of positions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross References</td>
<td>Steinzor (1950), Strodtbeck &amp; Hook</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Name
Hypothesis
Experimental Methodology
Subject
Variable and Measurement
Method of Analysis
Results
Significance and Strength
Critique

Hearn, 1957
In discussion groups people tend to interact more with those at a greater seating distance than with their closer neighbours.

Type - two task-oriented groups
Number of Ss for each intervention - 5 + E
Number of treatments for each S - 1
Number of groups for each treatment - 3
Type of treatments - (1) self motivated method - 8 non-structured weekly sessions in which the leader did not impose himself on the group,
(2) trained induced method - 8 structured weekly sessions in which the leader did impose himself on the group.
Task - formulating, as a group, a written solution to a given human relation problem
Seating Arrangement - U-shape, members and the leader occupied the same seats for all sessions

Source - male students enrolled in introductory psychology course
Method of Selection - Ss assigned randomly to their training method groups
N (S) = 30

Independent Variable - 3,2,1, seat intervals
Dependent Variable - frequency of verbal remarks - to whom comments were directed in the interaction sequence

Steinzor's method of data analysis

(1) self motivated groups - confirmed the hypothesis
(2) trainer induced groups - did not confirm the hypothesis (reverse trend)

(1) p < .02 (2) p < .001

- no random sample of the population
- the study used post hoc analysis of data collected for other purposes
- Ss and the leaders occupied the same seats for all sessions, which may have acted as a constraint on freedom of choice

(cont)
the study intended to test the "Steinzor effect"; however, Steinzor had recorded who-followed-whom in an interaction sequence while this study noted to whom a comment was directed; moreover this study used different shapes of arrangement and different group sizes.

Cross References

Steinzor (1950)
Name: Leavitt, 1951

Hypothesis: (1) Communication pattern will effect the group performance. (2) Centrality position in the communication network determines behaviour and produces differences in activity, satisfaction degree, and leadership status.

Experimental Methodology:
- **Type**: lab experiment and questionnaire
- **Number of Ss for each intervention**: 5
- **Number of treatments for each S**: 1 (15 trials)
- **Type of Treatments**: communication through four patterns:
  1. Wheel
  2. Y
  3. Chair
  4. Circle
- **Medium of Communication**: written preprogrammed messages, no audio-visual contact
- **Task**: discovering a single common symbol from among several

Subject:
- **Source**: male students, undergraduates
- **Method of Selection**: not specified
- **N (S)**: 100

Variable and Measurement:
- **Independent Variable**: (1) communication pattern, (2) centrality - the extent to which a position is strategically located relative to others in the pattern, in terms of availability to information
- **Dependent Variables**: (1) group performance - operational organization efficiency (2) individual behaviour (3) leadership nomination.

Method of Analysis:
- **Direct observation and analysis of data**

Results:
(1) confirmed the hypothesis: a. operational organization - in the wheel, Y, and the chain, the peripheral man funneled information to the centre
where an answer decision was made and sent out. The circle showed no consistent operational organization. b. efficiency - the chain and the circle used more messages to solve the problem and made more errors.

(2) confirmed the hypothesis. Position differences: a. participation - the most central position at the wheel, Y, and chain sent the greatest number of messages. b. satisfaction - the data showed a trend toward higher satisfaction with increasing centrality at the wheel, Y, and chain; the most central positions enjoyed their job more than any circle positions. Peripheral positions enjoyed the job less than any circle positions. c. leadership: in the circle only 13 of 25 Ss named a leader and those named were scattered evenly among all the positions. In the wheel, Y, and chain, the total frequency of Ss named as a leader and unanimity of agreement increased in the order shown (focusing on the central position).

Critique - not generalizable, only males used in the sample.
Name: Steinzor, 1950

Hypothesis: In a small group seated in a circle, the greater the seating distance between two people the greater the probability that they will follow one another verbally.

Experimental Methodology:
- **Type** - two discussion groups
- **Number of Ss for each intervention** - (1) 9, (2) 10
- **Number of treatments for each S** - 1
- **Type of treatments** - (1) 18 weekly sessions, non-structural formation with a designated leader. (2) 5 weekly sessions, non-structural formation without a designated leader.
- **Seating arrangement** - circle

Subject:
- **Source and Method of Selection** - not specified
  - (1) N (S) - 9
  - (2) N (S) - 10

Variable and Measurement:
- **Independent Variable** - seating distance: 5,4,3,2,1,-seat intervals
- **Dependent Variable** - frequency of verbal remarks: who-followed-whom in the interaction sequence

Method of Analysis:
- Re-analyzed data (collected for other studies) with $\chi^2$ test was used to define the difference between the observed and expected frequencies of verbal remarks. (The expected frequencies were assumed to be equal to all distances between seats).

Results:
- Confirmed the hypothesis
- $p<.02$

Significance and Strength:
- this in an expost facto design using data already collected for other purposes
- no control on the possibility of bias by the particular shape of the arrangement (circle)
- other factors that might determine the sequence of statements were not investigated, such as the impact of the content of a statement and its particular stimulus value for others; the effects of inequality of participation in terms of frequency and length of remarks; the intent and

(cont)
attitude of a speaker in making a particular remark
- no control on personality characteristics; it is possible that the outcome was a result of two high participators in the group tending to sit opposite each other.
C. General Critique and Applications

The studies which were presented suggest an experimental approach to the communication aspects of social behaviour, and provide an important insight into increasing communication efficiency in group interaction. The findings have shown that under different conditions imposed by the experiment, different communication patterns emerged. The differences among the patterns were mainly related to:

a. the location and the determination of a recognized leader in the pattern.
b. the direction of the communication flow.
c. the probability of optimum level for efficient performance.
d. the general satisfaction of group members.

All the above variables, however, were related to each other, which indicates again that attitudes, emotional climate, task, communication patterns and leadership are mutually interdependent.

The major handicaps of most of the studies presented in this chapter, are that they are primarily concerned with other factors (e.g., leadership) and only afterward was the physical arrangement of individuals examined for its effects upon the communication pattern. Therefore we should be somewhat skeptical about the reliability of these studies. Nevertheless, the results of the studies seem to extend and support each other. The work is diversified and forms a base for further hypothesis and investigations.

The thrust of the above findings does emphasize the importance of location as a determinant of communication pattern. The communication
network was found to be implicit in the seating arrangements of small
groups, in the sense that it affected the interaction patterns by
reinforcing the value of a specific location. The importance of an
individual's position in the communication network has been very clearly
shown in Leavitt's study. According to Leavitt's results, the
communication tends to flow towards the most central location. However,
when every position is indistinguishable from any other, such as in the
circle pattern (Steinzor), no specific seat shows significant or
advantageous "communication values".

A major factor that is important to keep in mind is that in
Leavitt's study, the participants were not able to see each other. As
it was shown, people respond and react to influences other than the
message or idea expressed verbally by an individual. Therefore, if a
person happens to be in a spatial position which increases the chance of
his being more completely visible to others, the stimulus value of his
statements are increased significantly by virtue of that visibility
factor. Consequently, findings in Steinzor's study can also be inter-
preted as reflecting the degree to which group members could physically
perceive one another. In the circular arrangement, there is no central
location; nevertheless, people sitting next to each other in the circle
probably were not able to observe each other as well as those sitting
farther away. Thus, it can be speculated that in the circular arrangement,
communication patterns tended to flow between opposite positions because
of the visual stimulus rather than verbal stimulus. However, when there
was a combination of both "visibility" and "centrality" as in Hare and
Bales' study, only the combination of both factors yielded significant results in the flow and direction of the communication.

It can be assumed that other factors are also operating to determine the sequence of statements. Inequality of participation in terms of frequency, and length of remarks, probably affect the sequence as well. Hearn found that the stimulus value of opposite seating is greatest in leaderless groups and is minimal in groups with strong leaders. This might suggest that when there are defined sociocultural factors i.e., leadership, these become more influential than spatial factors. In order to analyze the possible interaction effect of leadership and spatial factors, Hearn compared his results with those of Steinzor in a particular order, according to the degree of leadership assumed to be inherent in each group type. When the four methods were placed in this sequence, Hearn found that Steinzor's hypothesis was most strongly supported in the "leaderless" and "self-motivated" groups. This effect becomes less significant in the case of Steinzor's "Group-centered orientated", namely a group with a designated leader.

Hearn's results may also be explained in terms of eye contact since it is conceived as not permissible to look directly at a dominant individual at close quarters. We can hypothesize that in the presence of a strong leader, a group member restricts his gaze to adjacent seats, but when leadership is weak or absent, he can look anywhere, and the stimulus value of people seated opposite becomes heightened.

It can be said that the more we learn about the dimensions of
group interaction and the dynamics of different kinds of groups, the more we will be able to adopt the methods and techniques that will help us fulfill the specific purpose for which any group is organized. We have to clarify the group nature, goal and task before considering the appropriate communication pattern, in order to suit the group needs. We can expect that in a pattern with a high localized centrality, stable organization will evolve more quickly and the task will be done more efficiently and more accurately. However, the general satisfaction of such group members will be less and, in the long run, it might effect the stability of the organization and reduce its efficiency.

On the basis of the Steinzor and Hearn studies, it can be suggested that in instances where a greater extent of participation by group members is desirable, i.e., in a discussion group or classroom situation, it might be useful to arrange the rather expressive individual opposite the rather quiet one to increase the stimulation for the quiet one. On other occasions it might be helpful to have the two people who tend to monopolize the discussion sit next to each other in order to decrease the stimulation between them. In any event, putting any individual in a more central position in the pattern will probably induce him to increase his verbal participation.

In a group discussion situation when one aims to facilitate free interaction among the members, the circle arrangement, which provides each member with an equal opportunity to freely interact with all the others, should be recommended. On the other hand, when the group task requires that one person will be the focal point for collecting and selecting information (e.g., when the group has to solve a problem or
reach a solution) it is worthwhile to use other communication patterns (e.g., wheel pattern). When the attitude and the satisfaction level which participants get from being members in the group is at stake (e.g., therapy group) the spatial arrangement has to be designed in a pattern that will provide a free flow of communication in all directions without any position restrictions (e.g. the circle arrangement).

In a classroom situation when the nature of the topic requires the instructor to direct the discussion but without restricting it to a dialogue between himself and the student speaking, a horseshoe arrangement is recommended, with the instructor located at the open space. This will maintain the challenging and reinforcement power of the instructor without eliminating the condition for free interaction among the group members.
LEADERSHIP AND SPATIAL ARRANGEMENT

A. Conceptual Background

Many of the concepts typically used in discussions of leadership, such as central figure, dominant position, upper echelon, and high status, are based on spatial analogies. Since a connection exists between the function served by social order and spatial order, we should expect to find spatial correlates of status level and conversely social correlates of spatial positions. This chapter will show that in a small group, status and leadership are associated with differential space usage, due to the mutual dependency between seating position, communication patterns, and socio-cultural values.

It has been shown in the previous chapter that certain spatial positions have higher communication value. Furthermore, seating position, by influencing the direction in which the communication will flow, will be a primary factor in determining leadership in small group interaction. Heise and Miller's (1951) evidence suggested that the most centrally located member of a group is likely to emerge as a leader. Bales' (1953) study suggests a different direction to causality according to which: "The communication pattern tends to 'centralize' around a leader through whom most of the communication flows". Bavelas (1950) had shown that facility in problem solving and being nominated as the group leader, were both a function of the ease with which a group member was able to communicate with all the other group members.
Goldberg (1955) studying a task-group situation, suggested that member's influence and being perceived as a leader depended on one's spatial position in the group. His study is one of the best examples illustrating the relationship between spatial position in the communication network and leadership. He generalized previous work by suggesting that, regardless of the network he is in, a group member will be perceived more often as a group leader when his position in the communication network is more central. To test his hypothesis Goldberg used three types of networks, each with five nodes (see fig. no. 2.)

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<tr>
<th>STAR</th>
<th>FORK</th>
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Fig. No. 2.

(The numbers in figures represent the communication links for each position to all other positions.) The task of each man in the five-man group was to lead the group to a decision concerning the number of dots on a card shown for a short period. Unknown to the Ss, each of them was shown a different number of dots. Discussion was restricted to written messages on individual coloured cards. Each S was given an influence score by taking the absolute value of the difference between his initial and final estimate of the number of dots. At the end of the
experiment the Ss were asked for a leadership nomination. The results showed that group members with less communication links, i.e., in more centralized location, were nominated significantly more often as the group's leader, in all three networks. The results were quite similar to those of Leavitt's even though his groups were engaged in a different task. In Leavitt's experiment (1951) the central nodes were more likely to receive all the information necessary to solve the problem sooner than the other nodes in the group.

Howells and Becker (1962) tested the general hypothesis that seating position by influencing the flow of communication, is a determiner of leadership-emergence. They studied five-man group settings in which chairs were arranged so that two were evenly spaced along one side of a long table, and three were evenly spaced on the opposite side of the table. The task selected, and the conditions imposed on its completion were designed to stimulate group interaction, and to enhance the chances for development of group structure. At the end of the work session, questionnaires were distributed which required each group member to rank the other on 15 personality characteristics, and to compare the other four for leadership qualities demonstrated during the session. The analysis of the dots was based on the assumption that each person in the group had an equal chance of being voted leader. The results showed that twice as many leaders, as expected by chance, emerged from the side of the table which allowed a person to serve as a stimulus for more people. Accepting the authors' assumption that leadership emergence is a function of the communication pattern, then the results can
be taken to reinforce Steinzor's findings (1950) that communication flows across, rather than around, the table. Each of the two Ss which were nominated as a leader more often exert influence on three Ss, while each of the other three Ss exert influence on only two Ss.

Concerning the socio-cultural correlates of spatial factors, within some cultural frameworks the head of the table has several connotations. Hall (1960) described the preference for sitting at the head of the table as a trait of American culture, and points out that the French, for example, are much more likely to lay out space as a network of connecting points of influence, activity, or interest. The French supervisor, according to Hall, will ordinarily be found in the middle of his subordinates where he can control them. Russo (1967, Exp. 2) presents evidence for the cultural influence of the head position. She asked subjects to rate, on equal-unequal dimensions, five different dyadic seating arrangements of a same-sexed couple, as represented by drawing diagrams. The patterns consisted of side-by-side, corner-to-corner, directly across the sides, distant and opposite ends of the table. The results showed that the seating patterns have differing connotations.

The cultural influence of the "head of the table" was evident on the equality dimension. If one member of a pair were at the head of the table, the pair was rated significantly more unequal than if the members of the pair were both either at the two ends of the table or at sides of the table. The combination of one person at the head of the table and increasing distance, intensified the degree of inequality between pairs.

There is some evidence to indicate that the choice of spatial position in a group may be related to member's characteristics. Hare and Bales (1963) showed how dominant individuals frequently choose a position which facilitates greater participation and in turn determines
their leadership status. Another classic study of this issue was originated by Strodtbeck and Hook (1961). They analyzed data from 69 experimental jury groups carried out under standardized conditions. The jurors' seating position turned out to be an index of socio-economic status, with members from proprietarial and managerial backgrounds tending to select the head positions about 15% more frequently than would be expected under a random distribution, and 18% less frequently in a corner position. The jurors' first task was to select a foreman. The results showed that the foreman was three times more frequently selected from one of the two persons seated at the ends of the table than any other position. The authors view this as a clear indication that the jurors felt that there was some intrinsic "propriety" about the foreman being at the head of the table. More important was the additional finding that members seated at the head of the table were perceived as making more significant contributions to the deliberations. It was also found that the end position was significantly differentiated from the other positions in terms of higher average percentage of communication acts originated by the occupants of this position. In another study, Lott and Sommer (1967) attempted to analyze the relation between status and seating arrangements from both angles; whether people of different status would choose different locations - and the way an individual's spatial location determined status. Before beginning the study and in order to get some indication of status levels for the subjects they used, 103 students were asked to draw a subjective dominance hierarchy on campus, according to which the higher status figure was found to be "a professor", the lowest status "a freshman" and of equal status "another student from the same class". The subjects were asked where they would sit if they were to meet another person at the cafeteria. The questionnaire showed a
rectangular table with one chair at the head and one at the foot, and three chairs at each side. The first question was where the respondent would sit while waiting for the other person to arrive. The results show that the status relationship between the subjects and the stimulus person has a significant effect on their arrangement. The seat chosen for the second person varied with his status. The professor was significantly placed at the head position. In questionnaire form B, the same situation as before was described to the subjects, except that the person they were to meet arrived at the table first and the subject was asked where the other person would sit, and where he would seat himself. Again there was a strong tendency to place the high status person in the head chair. Furthermore, more than twice the Ss chose the head chair vis-a-vis the freshman than chose it vis-a-vis the professor. When all positions were spatially equivalent, as in the case of a square table, Ss chose the seat opposite the freshman and the professor, but corner to corner with their classmates. If we are assuming that the corner arrangement is psychologically closer than the across arrangement, the findings may be interpreted as showing a functional relationship between distance and status differences. In an earlier study, Sommer (1961, Exp. 1, 2) investigated a broad array of questions concerning leadership and spatial arrangements. In particular he focused on the following questions: (1) how people in groups arrange themselves vis-a-vis leaders who occupy various positions, (2) where leaders place themselves when given a free choice of positions, (3) do leaderless groups arrange themselves differently from groups with leaders. The results indicated that with groups of three, the leaders showed no significant
preference for any seat of the eight which were available around the rectangular table. However, with groups of four, five and six, the leader usually sat at the head position. When the leader sat in the head chair the corner chairs were used most frequently. The emphasis was on being as close as possible to the leader. But on the other hand, Ss very seldom chose to sit on either side of the leader when they could arrange themselves so that they could face the leader either in the opposite or in the corner positions. These findings suggest that being visually accessible to a leader is an important consideration in the selection of seats by Ss. The distant chairs were rarely used and when the leader sat at one end of the table, the other end position was hardly ever occupied. Leadership groups as well as groups with leaders gravitated to the ends of the table. The dominant seating pattern in groups of all sizes was around one end of the table. When one end chair was occupied, it was extremely unlikely that anyone would sit at the other end chair.

The tendency of groups to gravitate to one side of the table, irrespective of the existence of formal leadership, can suggest that either groups tend to coordinate seating arrangements to maintain shorter interpersonal distances to facilitate communications or, in fact, informal leadership always emerges. Unfortunately, the study did not present any data to clarify those issues.

The studies reported in the above have outlined the close connection between spatial arrangement and status. Typically, status and location are confounded so that prestigious individuals and leaders occupy the best places. In those cases, space allocations not only indicate status, but also reinforce it.
B. Summary Charts of Studies Relating Leadership and Spatial Arrangements.

Name: Strodtbeck & Hook, 1961

Hypothesis: Reanalyzed jury trial data to learn the effect of table position on leadership nomination, level of participation and affiliation.

Experimental Methodology:
Type - observation of experimental jury deliberations
Number of Ss for each intervention - 12
Number of treatments for each S - not specified
Number of groups observed - 69
Method - the jurists were accompanied by a bailiff to the deliberation room which contained a rectangular table surrounded by 12 chairs; the jurors first task was to elect a foreman and then to reach a unanimous decision.

Seating Arrangements -

Position types: end - 1, 7 corner
corner - 2, 6, 8, 12
flank - 3, 5, 9, 11
middle - 4, 10

Subject: Jurors drawn by lot from a pool of three hundred persons from Chicago and St. Louis courts. With regard to sex and socio-economic status, the jurors were representative of the registered voters in the two communities
N (S) - not specified

Variable and Measurement:
Independent Variable - (1) Ss' socio-economic background, (2) seating positions
Dependent Variable - (1) seating positions, a. leadership nomination, b. level of interaction, c. affiliation

Method of Analysis: Recording of seating arrangement and data collected by questionnaire

Results:
(1) leadership - the foreman most frequently were elected from those seated at the end positions
(2) socio-economic influence on the selection of seats - proprietor and manager classes sat in the end positions 15% more frequently, and in the

(cont)
corner positions 18% less frequently than would be expected under a random distribution
(3) interaction acts originated by positions - end 10%, corner 7.5%, flanks 7.8%, middle 8.4%
(4) contribution and affiliation - the data indicated that Ss are closest in the sense of votes interchanged to the S directly opposite, next closest to the persons at his sides, then in decreasing rank order to the person one seat to either side.

Critique
- while the jurors enter the room at the same time, those at the front of the queue have a wide choice of seats around the table whereas the last few have little choice but to fill in the vacancies. Hence it is difficult to refer to the situation as a free choice one.
- no control on previous acquaintance among Ss
- no control on personality predispositions
Sommer, 1961

The investigated problems were: (1) how people in groups arrange themselves vis-a-vis leaders who occupy various positions, (2) where leaders place themselves when given a free choice of position, (3) whether leadership groups arrange themselves differently than groups with leaders.

Type - task-oriented discussion groups
Number of Ss for each intervention - 3, 4, 5, or 6
Number of treatments for each S - 1
Type of treatments - Ss were divided into 2:
a. group size 3-6, same sex, Ss were asked to elect a leader; the leader was then given a topic and instructed to choose his seat at the table and discuss the topic with his group
b. the same as above except each S was given the discussion topic and there was no election of a leader

Seating Arrangement -

i. end position, ii, corner position, iii. side-centre position

Source - visitors to a mental hospital, non-professional employees, volunteer workers, student nurses
Method of Selection - not specified
N (S) = 805

Independent Variable - (1) groups' size, (2) presence or absence of authority figure
Dependent Variable - seating arrangement

Comparisons between the choosing of seats and change expectancies were evaluated using the two-tailed $\chi^2$ test

(1) groups with leader - leaders' preference seats: N(group size) = 3, no significant preference; N = 4, 5, or 6, leader prefers the end position. Ss preference of seats: N = 3 to 6, when the leader is seated at the end position S preferred the corner position. When the leader sat at the corner position: N = 5, S preferred to sit beside the leader; N = 6, no dominant preference.

(cont)
When leader sits in the centre, Ss did not show a significant preference. (2) leadership groups - the dominant seating positions in groups of all sizes was around one end of the table.

Significance and Strength

p < .05

Critique

- no control on previous acquaintances among Ss
**Name**
Goldberg, 1955

**Hypothesis**
(1) the less the communication distance of a group member, the less will his opinion be influenced by other members when the group attempts to arrive at unanimous decisions.
(2) the less the communication distance of a group member, the more often he will be regarded by his groups' members as the leader.

**Experimental Methodology**
- **Type** - lab experiment task-oriented group
- **Number of Ss for each intervention** - 5
- **Number of treatments for each S** - 1
- **Number of groups for each treatment** - 10
- **Types of treatments** - communication through three types of networks:
  1. star (wheel) . . .
  2. chain . . . . .
  3. fork (Y) . . .

*Method of communication* - written messages restricted to definite positions according to the particular network, no eye contact

*Task* - make a decision as a group, and individually nominate a leader

*Task environment* - structured

**Subject**
- **Source** - army inductees at army reception center
- **Method of Selection** - not specified
- **N (S)** = 150

**Variable and Measurement**
- **Independent Variable** - (1) communication distances (centrality) (2) communication network
- **Dependent Variable** - (1) influence, (2) leadership nominated

*Measurement* - (1) communication distances, the total number of communication links that each position had to assume in order to communicate with the other positions
(2) influence - the extent of S's judgement change from the beginning to the end of the group task
(3) leadership - the number of times S was nominated as the group leader
<table>
<thead>
<tr>
<th>Method of Analysis</th>
<th>$\chi^2$ to test the significance among statements; the direction of the differences was tested by rank order correlation. The p values from the two tests were compared.</th>
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<tbody>
<tr>
<td>Result</td>
<td>(1) confirmed the hypothesis. (2) confirmed the hypothesis.</td>
</tr>
<tr>
<td>Significance and Strength</td>
<td>(1) $p &lt; .017$  (2) $p &lt; .001$</td>
</tr>
</tbody>
</table>
| Critique           | - the sample represented a population which is indoctrinated to restricted structure (army inductees)  
                      - no. control on previous acquaintance among Ss which might effect the interpersonal relationship beyond the physical arrangement. |
| Cross References   | Leavitt (1951)                                                                                                                                   |
Name: Howells and Becker, 1962

Hypothesis: A greater number of leaders will emerge from the side of the table which allows S to face more people.

Experimental Methodology:
- **Type**: task-oriented decision group and questionnaires
- **Number of Ss for each intervention**: 5
- **Number of treatments for each S**: 1
- **Type of treatment**: structure with no restricted communication
- **Number of groups**: 20
- **Seating arrangement**: 2 Ss were facing 3 Ss across small rectangular table

Subject:
- **Source**: undergraduate male students
- **Method of Selection**: paid volunteers
- **N (S)**: 100

Variable and Measurement:
- **Independent Variable**: seating position
- **Dependent Variable**: leadership (rating by other members of the group)

Method of Analysis: Analysis of the data was based on the assumption that each S in the group had an equal chance of being voted as a leader. The expected frequency by chance was compared with the observed results.

Results: Confirmed the hypothesis

Significance and Strength:
- \( \chi^2 = 7.5 \ p < .01 \)

Critique:
- no control on previous relationship among Ss
- no data available about the direction and frequency of communication
- no control on personality predispositions of Ss

Cross References: Steinzor (1950), Bass & Klubeck (1952)
Hypothesis
(1) increasing seating distance will indicate unfamiliarity, hostility, untalkativeness
(2) seating position at the head of the table will affect the equal-unequal dimension

Experimental Methodology
Type - questionnaire
Number of Ss for each intervention - 1
Number of treatments for each S - 1
Type of treatment - S was asked to rate a series of 5 seating arrangements on four dimensions:
   a. intimate - unacquainted, b. friendly - hostile,
   c. talkative - untalkative, d. equal-unequal
Seating Arrangements - were shown in diagram form of a rectangle with six circles around it; five different seating arrangements of pairs of same sex were presented:

Subject
Source - pool of sociology undergraduate students
Method of Selection - random
N (S) = 38 (m = 20, f = 18)

Variable and Measurement
Independent Variable - seating arrangements
Dependent Variable - denotation of the different seating arrangements.

Method of Analysis
Overall median tests the ratings for each of the five seating arrangements on all four dimensions; t test was applied to analyse the difference between means of the five seating patterns on each of the four dimensions.

Results
(1) confirmed the hypothesis: the seating patterns ranked for the first three dimensions was I, II, III,
V & IV (from positive to negative scale). However there were no significant differences between I and II.
(2) confirmed the hypothesis: seating pattern ranked I, III, V, II and IV (from equal to unequal)

Critique - no follow-up to check the results in a real situation.
Name: Lott & Sommer, 1967

Hypothesis: People of different status choose different seating positions.

Experimental Methodology:
- **Type**: questionnaire of six versions (three status levels x sex)
- **Number of Ss for each treatment**: 1
- **Number of versions for each S**: 1
- **Type of treatment**: Ss were asked to indicate on questionnaire showing a rectangular table with 8 chairs distributed around it, the seating position that will be chosen: A. by S who arrived at the table first, B. by another person arriving after S has been seated

Subject:
- **Source**: students (university)
- **Method of Selection**: the six versions of the questionnaire were passed out randomly during class sessions
- **N (S)**: 224

Variable and Measurement:
- **Independent Variable**: (1) status of S vis-a-vis other
- **Dependent Variable**: choosing of seating position
- **Definition of Status Used**: higher status - a professor, lower status - "freshman who is doing poorly in school", equal status - "another student in your class"

Method of Analysis: \( \chi^2 \) test

Results: Confirmed the hypothesis: a. the status relationship between S and the stimulus person has a significant effect on the arrangement. b. the seat chosen for the other person varied with the status of the other person; high status was placed at the head position.

Significance and Strength:
- A. \( \chi^2 = 18.89 \) df = 4 p < .001
- B. \( \chi^2 = 13.77 \) df = 4 p < .01

Critique: - no follow-up in a real situation.
C. General Critique and Application

The studies described in this chapter can be classified into one of two basic approaches:

1. The relational space approach - focusing on the impact of various spatial positioning.

2. The cultural approach - focusing on the symbolic importance of various fixed locations.

Clearly the two approaches are not mutually exclusive. They differ in the emphasis they put on the impact of positioning versus the primacy of institutionalized norms. The first approach assumes that the person occupying the most centrally located position within a communication network will most likely attain a leadership status. The second approach suggests that seating arrangements are programmed into socio-cultural norms.

The weakness in all the studies is the limited range of cultures and population sampled. Almost all the studies took place in the United States, using samples of student populations. This could be a serious limitation because, as Hall has shown, comparable classes of individuals in other parts of the world use space differently.

An equally serious problem concerns the confounding of location, status, and personality. The results of the studies reported in this chapter show that there is a connection between status and location which is determined both by fixed and relational aspects of the environment. The identification of certain seating positions with
status levels, as well as the location of another person already seated, was found to be consistent. In view of the "head chair" association with leadership in our culture, the division of space becomes intertwined with the existing dominance order. All studies agreed that choice of seats is non-random with respect to status and personality. High status, dominant individuals in American culture gravitate to the head position, and people who occupy the head position participate more than people at the side position. But it is difficult to disentangle status from location in these studies. It is possible that occupancy of certain locations automatically raises an individual's status and or dominance. On the other hand, it may be that the dominant individuals choose these locations for reasons of tradition and will participate more where-ever they sit, thus their location has no essential connection with the participation. It may be that high status people tend to participate more and certain locations also increase participation, but the combination of the two results in greater participation than each by itself. The only way to disentangle these variables is to conduct experiments in which unknown people are randomly assigned to various locations and their relative contributions noted. But then again, it must be recognized that these conditions are highly artificial in a society such as ours that typically allocates space according to status.

Another limitation in establishing causality is the difficulty in assessing the relative influence of personality and interpersonal style, as opposed to the relative influence of seating position on behaviour.
Stated simply:

Do members select seating positions to suit their behavioural style, or do they participate as they do because of their seating positions?

It seems clear that some members select seating positions because of their leadership qualities, while others have their hierarchical positions determined by their seating positions.

Even before reaching the stage of a full understanding of the profound dynamic correlation between spatial location, personality and leadership, we can draw from the findings some practical applications to a variety of situations.

In any culture, we can reinforce participant status by appointing one to a certain location in a pre-determined arrangement. In the North-American culture the head of the table has always been associated with leadership status, hence the one located there has a primary advantage in the ability to exercise a leadership role. Though studies have not clarified yet if greater mean seating distance or higher degree of accessibility to visual contact have a stronger impact on determining status, in the American culture any spatial location which will provide both a greater mean seating distance and better accessibility will reinforce the leadership status of the person occupying the position. According to the same principles, isolation or weakening of an opposing faction can be accomplished by placing its members at the farther distance of a long table, and by distributing them across a wide table to prevent them from engaging in cross-communication.
Although knowledge of the spatial factors which influence the emergence of leadership can be utilized to manipulate the group process, in many cases the nature of the group and its task require a pre-determination of the designated leader regardless of the spatial arrangements. There are cases where leadership-enhancement is regarded as undesirable or is desired but not through the means of reinforcing participant status by location. In such cases, it may be necessary to deploy participants in seating arrangements emphasizing positions which have equal symbolic significance, equal mean seating distance, and equal visibility.

Seating arrangement is one of the most effective means to express authority and hence the nature of the interaction. In formal interaction, when one of the participants chairs a meeting, he will always be located at the central location (in western culture, most likely at the head of the table. Such a seating arrangement serves not only the purpose of focusing upon the chairman, but also predetermines the nature of the interaction. Therefore, if one is interested in promoting informal interaction, it is best to avoid seating arrangements that reinforce certain positions, and to choose instead the undifferentiated square or round table where the sides have equal symbolic significance. These matters are crucial in peace conference situations for example when the parties involved share a great deal of suspicion of each other and are very sensitive to any real or imagined pre-advantage that the other party might have. In a situation of negotiation between management and workers, management can signal to the workers their disposition through their choice of the seating arrangement: if it is to be a formal negotiation at which management is going to present its side from an authoritative posture, they are more
likely to use the head of the table arrangement. On other occasions, they can signal their willingness to listen and compromise through relatively non-structured seating arrangement.
CHAPTER VI

SUMMARY AND CONCLUSIONS

The studies reviewed, though differing widely in approach and methodology, clearly point to the importance of space in social interaction. Spatial cues serve the dual function of communication and facilitation or the hindrance of interaction. "Spatiality" in animals is a species-specific instinctual or imprinted phenomenon. The reaction-patterns of man prove to be more complex, hence use of space provides a meaningful device in the observation of human behaviour. The study of human spatiality has been termed proxemics, and covers the entire field of human spatial usage. The definition of proxemics includes the total behaviour of man in regard to the structuring of space, from the way he perceives his environment in terms of space, to the way he uses space in his interpersonal relations. The study of the spatial factor with respect to small groups has been termed small group ecology.

It has been shown that the spatial distribution of individuals in small groups is not random but rather a function of the personality and cultural background of the individual involved, the task, and the nature of the physical and emotional setting. Stated more simply, it can be said that spatial arrangement in a small group is a function of culture, personality, task and environment.

While the processes which condition or are affected by spatial configurations are complex, this thesis suggests the utility of viewing them through the following simplified conceptual model (see fig. no. 3).
LEVEL OF ENVIRONMENTAL INVOLVEMENT

CONFIGURATION FACTORS VARIABLES

INTERACTION REFLEXIVE VARIABLES

INDIVIDUAL

Sex Socio-Economic Mental Health

(1) (2) (3)

Spatial Cultural Norms

(4)

Spatial Adjustment

(7)

Personal Space

(5) (6)

Personal Attitudes Emotional Mood

(8)

Type of Task

(9)

Seating Arrangement

Communicative Medium

(10) (12)

Communication Pattern

(11)

Task Performance Status and Leadership

(13)

Fig. No. 3.

Arrows indicate the direction of influence; numbers will be used as reference for further explanation and examples in the text.
The central part of the model: the interaction factors, presents the basic processes of interaction and organization of a small group. There are three classes of variables which affect the processes. One class of variables ("environmental configuration") reflect the physical environment of the group or the individual in the group (group ecology). A second class ("interaction factors") consists of the organizational environment and is in part a by-product of the interaction processes themselves. A third class of "reflexive variables" reinforce or impose constraints on the patterns of interactions and organization of the group. More specifically, the scheme can be described on two levels of human involvement: (a) individual and (b) small group interaction. Starting on the individual level it has been shown that cultural spatial norms define and modify "personal space". In turn, cultural spatial norms are studied primarily as functions of sex (1), socio-economic background (2), and the mental health of the individual regarded (3). In addition to spatial cultural norms (4), "personal space" is mutually dependent upon the personal attitude (5) and the emotional mood (6) of the individual in a particular situation. In sum, "personal space" is an abstraction of various processes concerning preferences of location in a particular environment and can be observed only in non-equilibrium states when members seek adjustments in their location to cope with non-optimal arrangements (i.e., spatial adjustments (7)).

For the group level there is an additional dimension - the group task. The type of task facing the group defines the nature of the interaction which feeds back into the process of personal space definition (8). The spatial adjustment at this level (when the individuals are involved in small group interaction) is reflected by
seating arrangement (9). Group task is usually a given factor and as such affects and determines the communication media and the intensity of communications. Communication media in turn determine the communication pattern. However, the communication patterns are also affected by the seating arrangements which are the environmental configuration at this level (10). The communication pattern is also affected and effected by the status hierarchy of the participant (11). Status of a member is mutually affected in part by position within the seating arrangements (13). The particular way in which this effect takes place is often programmed into the culture. The status in turn stimulates the evolvement of leadership. When a member is perceived by others as a leader his status will tend to be reinforced. The task performance which in many cases represents the goal for which the group was arranged is a function of status hierarchy and the communication pattern. But it is also actively affecting the communication pattern and the status structure (12).

This cross impact model does not represent the total relationship existing among its components. One could probably point out many other interdependencies which exist among the processes and the variables. However it emphasizes those processes which the literature on small group ecology and proxemics choose to focus upon and helps to clarify some of the major relationships which emerge from that body of literature. The major examples are again:

(1) (the numbers referred to the process in the model - see fig. no. 3)

Sex vis-a-vis spatial cultural norms - there is a strong sexual link in the spatial arrangement. A female moving into a man's territory
encounters a different set of signals than if she were moving into a woman's territory. In the American culture both sexes tend to stand more closely to women than to men (Willis 1966). Between two women in the western culture, a close physically intimate state is more acceptable than between men (Hall 1964). The idea that females can tolerate closer physical presence than males is underscored by observation of women holding hands or kissing one another, practices which are uncommon between males in the culture (Hall 1964). Furthermore, females make greater use of closer distance arrangement than do men (Sommer 1959), (Elkin 1964), (Norum 1966), (Pellegrine & Empey 1970), e.g., the side-by-side arrangement, which is generally considered to be the most intimate of all seating arrangements for people already acquainted. Side-by-side arrangements are comparatively rare among males if they are given the opportunity to sit across from one another.

(2) Socio-economic background vis-a-vis spatial culture norms -
There are spatial correlates of status level and conversely, social correlates of spatial positions. People from proprietarial and managerial backgrounds tend to select the most central location e.g., the head position at the table in western culture (Strodheck & Hook 1961).

(3) Mental health vis-a-vis spatial cultural norms - Mental patients have a distorted concept of personal space, therefore they utilize and perceive spatial configuration in a different way. For example: under stress condition, people high in anxiety tend to use greater spatial distances (Luft 1966). Extroverts show a tendency to approach the experimenter more closely than introverts
Schizophrenics approach the experimenter differently from normals (Sommer 1959).

4. **Spatial cultural norms vis-a-vis personal space** - There are cultural variations of personal space conception and utilization. Hall concluded that men from different cultures behave differently in spatial manner from one culture context to another because they have internalized their surrounding in the special and ordered ways of their particular culture experience (Hall 1960).

5. **Personal attitudes vis-a-vis personal space** - Interpersonal proximity is used as an instrumental affiliative act (Rosenfeld 1965, 1966) (DeLong 1970). There are inverse relationships between positive attitude and mean distance arrangement (Little 1965) (Russo 1967). The perceptions of a person at different distances are a function of the perceiver's own preferred proximity (Porter & Argyle & Salter 1970).

6. **Emotional mood vis-a-vis personal space** - Seating position, relational space (i.e., the way people orient themselves toward one another) and the overall ecology of the group are indicators of the general group feeling (i.e. emotional mood) (Wilner 1958) (Winick & Holt 1961).

7. **Personal space vis-a-vis spatial adjusting** - The degree of the environmental or the internal threats to self and self-esteem will determine the extent of the spatial adjustment (Luft 1966) (Fisher & Cleveland & Horowitz 1966). Spatial invasion and violation of expected distance have a disruptive effect and produce
reactions ranging from flight at one extreme to antagonistic
display at the other (Felipe & Sommer 1966/67).

Type of task vis-a-vis personal space and seating arrangement -
People will choose different arrangements according to the task,
and different tasks are associated with different spatial arrange­
ments. For each type of task there is an "expected" behaviour
and corresponding spatial arrangement (Sommer 1959, 1965) (Norum
& Russo & Sommer 1967).

Seating arrangement vis-a-vis communication pattern - Ease in
verbal interaction is affected by the distance between individuals
(Steinzor 1950) (Hearn 1957). Persons tend to sit opposite one
another in order to interact until the distance exceeds a
comfortable range (Sommer 1961, 1962). People in neighboring
chairs interacted more than people in distant chairs, and those in
corner or frontal positions interacted more than people alongside
one another (Sommer 1965). Seating arrangement, by influencing
the communication pattern, becomes a determinant of leadership-
emergence in a task-oriented group (Howells & Becker 1962).
People at end and central positions participated more and were
rated as having greater influence on the decision-making process
than people at the sides (Strodtbeck & Hook 1961) (Hare & Bales 1963).

Communication patterns vis-a-vis status of participant - Dominant
individuals frequently choose positions which facilitate greater
participation (Hare & Bales 1963) (Strodtbeck & Hook 1961). In some
cases by virtue of the relative advantage a member possesses in
terms of his position in the communication network, the probability
of him becoming a leader increases (Leavitt 1951).

(12) **Communication pattern vis-a-vis task performance** - The performance of a small task-oriented group depends upon the channels of communication open to its members and its task (Heise & Miller 1951). Communication pattern reciprocally affects group performance in a given task (Leavitt 1951).

(13) **Seating arrangement vis-a-vis status of participant** - People of different status choose different seating positions (Lott & Sommer 1967). Leaders and high status people gravitate to the ends (head) of the table (Strodtebeck & Hook 1961). Persons occupying the head position are rated as higher status than those in the middle seats (Bass & Klubeck 1952). Members of a group arrange themselves differently in the presence of a leader (Sommer 1961).

While many of the hypotheses underlying the details of this conceptual model are generally accepted intuitively in practice by politicians, group workers, and those who host social gatherings, it is the researcher's task to make these notions explicit and testable, and to identify their relationship to other human factors. Clearly, however, several problems of method and approach must be resolved before any comprehensive theory of group ecology can be developed. One of the more conspicuous problems is that most of the valuable research on the way that people or animals use space has been conducted in situations of maximum constraint - either in a zoo or in some other setting of animal captivity, or, in the case of human subjects, within the confines of mental hospital wards. Studies of human spatial interaction in everyday
situations are rare. The use of a cold and impersonal laboratory, where the subjects might suspect hidden microphones and one-way mirrors, does not really provide a setting where free interaction can occur, as compared to natural situations.

Another handicap is that researchers tend to stubbornly advocate only one of the two basic approaches, without taking advantage of their complementarity. Of the two major approaches to the study of small group interaction with respect to spatial arrangement, the first investigates the influence of the spatial arrangement on interaction, while the second seeks to determine the effect of the interaction on the preferred spatial arrangement. The former approach is exemplified by the studies in which seating position in a small group has been demonstrated to influence the amount, orientation, and direction of communication. The second major approach - the investigation of the effect of interaction on the spatial arrangement - is illustrated by studies which assume that such variables as the task, sex, and personal attitudes of participants are primary determinants of small group spatial arrangements. The tendency of researchers to dichotomize these approaches suggests, by implication, their view that it is impossible to isolate the respective factors associated with each approach, within the same experiment. But future studies must be conducted and designed so that they will relate and investigate the combined weight of social, cultural and environmental factors and describe and measure the reciprocal effects between group interaction and the spatial location of members.

Personal space through spatial arrangement or its reflection on seating arrangement is one dimension of non-verbal behaviour. As such it is representative of a media of communication. In our modern confused world verbal expression often tends to become a means of distorting,
obscuring and even avoiding communication rather than a means of accurate expression, especially when real feeling or thoughts are concerned. This results from over-sophistication in our languages combined with restrictive programming (e.g. cliches and slang). The language often tends to guide a person through paths he does not intend to follow and disguises and alters messages he sends to others. Consequently, given the increased requirements for communication to promote interpersonal understanding, there is a need for additional channels of communication. The most obvious channel is non-verbal communication which in many cases is now a largely unconscious process. Spatial arrangement, when free of constraints, is one of the most common devices of non-verbal behaviour since in any social interaction participants have to relate themselves spatially to one another. In social interaction it has been observed that interpersonal space accents, qualifies and delimits verbal interaction (Birdwhistell 1970). The spatial arrangement, as one dimension of group activity, can be productively observed and utilized both as a means of therapy and as a subject for research in interaction processes. Knowledge of how groups arrange themselves can assist in fostering or discouraging group relationships. By using relatively simple designs of arrangement as shown or suggested in this thesis one can achieve a degree of control and impact upon the emotional climate, the nature of the interaction, the communication pattern, and the recognized status of a participant. With more fundamental research in the field of proxemics and group ecology we can extend our knowledge about the dynamics of human interaction. This knowledge concerning the feedback of spatial
arrangement becomes even more important in view of the problem of crowding and over-population facing the world. Utilization of this knowledge may help to relieve those crises. In order to solve the many complex urban problems facing the industrial world today we must begin questioning our basic assumptions concerning the relationship of man to his environment as well as man's relationship to himself. The turning point might occur when we cease to assume that the inter-relationship of man and his environment are separate but rather part and parcel of one interacting system. For example: by dividing a large space in an appropriate way we can provide a comfortable amount of personal space for more people. The same space when divided in such a manner which eliminates eye contact and interaction can be populated by a larger number of people with relatively more comfort and ease than when it is widely open. Accepting this principle requires a new approach in architectural design for homes, offices, and plants. Using portable dividers, for example, (as is done in some cultures) can provide us with a new measure of active control over our domestic environment since it allows us to arrange different types and sizes of space according to the task and the nature of interaction required. The resultant flexibility of space utilization may even assist in bringing about better family relations by enabling family members to socialize in one open space with the option to change to separate, smaller spaces when there is a need for more privacy.

In summary, the use of space and spatial arrangement possesses a great deal of potential to affect human behaviour. Man and his environmental extensions constitute one interrelated system. Because of this crucial interrelationship it behooves us to pay much more attention to
its significance and consequences for our behaviour and well-being, in
the quest for both cooperative relations and individual privacy. As
Ian McHarg concludes in "Man and His Environment":

"...no species can exist without an environment,
no species can exist in an environment of its exclusive
creation, no species can survive, save as a non-
disruptive member of an ecological community. Every
member must adjust to other members of the community
and to the environment in order to survive. Man is
not excluded from this test."
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