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CERTAIN VERBAL CHARACTERISTICS AND VISUAL INTERACTION
IN AN INTERVIEW SETTING AS A FUNCTION OF
INTERPERSONAL DISTANCE, ROOM SIZE
AND INDUCED STRESS

A Dissertation Presented

By

Florent R. Dumont

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University of Massachusetts in
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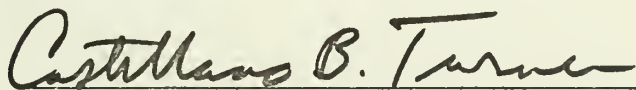
Florent R. Dumont

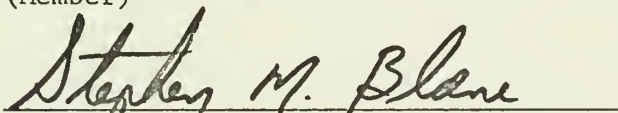
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(Dean of School)


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A C K N O W L E D G E M E N T S

The writing of a dissertation, like any other human enterprise, is never a solitary achievement. On the most basic level it is made possible by the generations of educators and scholars who have laid the foundations of the discipline being investigated, and who created the free university where the human spirit can explore, ferret and speculate, untrammelled by prejudice and ideology. On a more immediate level, it has been made possible by the generosity of the citizens of the Commonwealth of Massachusetts who have built and made available to me the resources of a great university. Of hardly less importance has been the implicit support of a community of educators, some of whom have personally interested themselves in my education and professional future. I wish to publicly express my appreciation to them.

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VERBAL CHARACTERISTICS AND VISUAL INTERACTION AS A FUNCTION
OF INTERPERSONAL DISTANCE, ROOM SIZE AND INDUCED STRESS

Abstract of Dissertation

Within an analog interview setting, the influence of room size, interpersonal distance, induced stress and interviewer on several criterion variables was investigated. The criterion variables were duration of utterance, verbal quantity, eye contact, and verbal velocity. Using a mixed factorial analysis of variance design, each of 36 students was assigned to one of three stress levels and to one of three interviewers. Every subject was then interviewed in every possible combination of three room sizes and three interpersonal distances.

It was found that very close distance depressed the duration of utterance and number of words uttered but left verbal velocity relatively unchanged. No difference was found in these measures as a function of either room size, interviewer or stress as induced in accord with the design. Eye contact was found to be significantly less in a large room (280 square feet) than in the two smaller rooms (144 and 64 square feet). This measure, eye contact, was also depressed by close interpersonal distance. It rose progressively at the greater distances of the design. This latter finding was in accord with previous studies. There were no significant interactive effects of the various experimental factors with the exception of the following: an experimenter by distance effect and an experimenter by distance by stress effect. The study concludes that interviewee speech and visual behavior is significantly affected by size of room and interpersonal distance.

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C H A P T E R I

INTRODUCTION

Background of a New Science

One of the purposes of science is to define, clarify, explicate and prove the wisdom that is commonly known as "common sense". But it has a prior and more important purpose and that is to determine whether it is sense to begin with. "Common sense is that which tells us that the world is flat," observed Stuart Chase (1938) many years ago. This was a semanticist's subtle and ironic warning that what commonly passes for truth among people may be far removed from it and that we must be alert to the dangers of unquestioningly accepting the assumptions and perceptions of a traditional Weltanschauung. The unquestioned assumptions of the past, though respectable, may not only be useless to man, but may also be a threat to his well-being. This does not mean that such assumptions were never true or even useful; they may have served some highly practical and heuristic functions at one time. It does mean, however, that as our world changes, the assumptions and the perceptual biases that we inherited from the past become increasingly suspect. We are under sentence of constantly re-examining these lest we jeopardize not only our well-being but also our survival.

To use an example which has relevance to the general concerns of this study, the human race has always been concerned about the scarcity of economic resources relative to the needs of any given population. Whenever population pressures threatened the balance of needs and

resources, given a certain level of technology, law and organizational sophistication, the solutions were usually conceived in terms of war and pillage, migration in a seemingly boundless universe, or increased productivity. The classic Malthusian dilemma was couched in terms of food and arable land and number of human mouths to feed. But the proliferation of the human species at a terrifying rate, where we measure increases in population by the hundreds of millions on a planet which looks increasingly small to us, presents us with radically new problems and a need for a radically different set of assumptions than we have had in the past. The perspectives of the politician, the churchman, the economist, the physician, have been the traditional solutions of more food, more clothing, more buildings, more machines, more religious faith, more laws and agencies. To date, they have not seen clearly that man's survival, as well as that of other species, requires more than this; it requires a subtle, complex and delicate balance among all the biophysical components of the earth.

A word has recently come into vogue to symbolize this idea: ecology. Like its etymological cousins, economy and ecumenical, all derivative of the Greek word which means "household", it implies that if an organism or family or other group is to grow and thrive, it must live in a harmonious relationship with its total environment. All life continues by virtue of a fragile web of interdependencies. And if a significant factor is disregarded, dislocated or destroyed, the total system, which is our planetary ecology, is given a violent wrench.

Under the impact of a rapidly growing world population, social

scientists and, indeed, a large segment of the educated American public have begun to take an increasing interest in ecological matters. Numerous indications of this interest are evident. Under the auspices of the Psychology Department, a graduate training program in environmental psychology has been inaugurated at the City University of New York (Wohlwill, 1970). Less comprehensive but related programs have been started in other schools to train persons to deal with man-environment problems. Organizations such as the Environmental Design Research Association (EDRA), the Association for the Study of Man-Environment Relations (ASMER), the Institute of Physical Planning at Carnegie-Mellon University, and the Division of Man-Environment Relations at the Pennsylvania State University are springing up to further the investigation of the incredibly complex socio-environmental systems which have already taken shape, for better or for worse, and to promote research in more viable systems for the future. Several journals have appeared in the past few years which are basically channels for the dissemination of fresh and creative ideas for the development of new eco-systems. Such journals are Man-Environment Systems, Environment and Behavior, and Design and Environment.

One area of special interest that has been generated by the agglomeration of vast numbers of people within highly constraining life-spaces is the area which deals with the way that man functions within the very space which he himself has structured. Within the past two decades a new discipline has emerged which has as its principal object the study of how man structures what Hall (1966) calls microspace, i.e., man's living quarters, schools, office areas,

recreation areas, cities, etc. He coined the word "proxemics" to designate this study. It would be a mistake, however, to think of this nascent science as having arisen solely by virtue of the need to deal with problems of crowding in our big cities. Crowding in cities has been a factor that people have had to cope with for centuries. Rather, it results from the convergent interests of city and regional planners, civil and sanitary engineers, architects, sociologists and anthropologists who have realized that the problems of a relatively diminishing life-space were forcing men to acquire a more systematic and thorough understanding of the influence of spatial factors in human behavior.

Every society has adopted, through the complexities of its own cultural institutions and the geographic parameters of its national life, styles of functioning in space and systems of regulating human conduct in a spatio-temporal continuum. To begin to make sense of them requires more than a narrow analytic study of spatial factors. Ultimately, the broad principles of proxemics will have to be generated out of an interdisciplinary matrix in which empirical and experimental findings must be interpreted and related to a cross-cultural and holistic view of man.

The intellectual antecedents of this newborn science are primarily the studies of some notable ethologists who discovered that spatial factors were important not only for regulating the social relationships of many species of birds and animals, but, indeed, necessary for their very survival (Calhoun, 1962; Christian, 1960, 1961; Hediger, 1961; Lorenz, 1955; Tinbergen, 1951, 1953; Wynne-Edwards, 1962). There is a

natural reluctance to, and indeed, the canons of scientific methodology and its epistemological assumptions, prevent us from extrapolating from ethology into the domain of the human behavioral sciences. But the findings of the ethologists have been powerfully suggestive of parallel studies to be done in the area of human behavior. The era of the sixties have seen a spate of experimental investigations in precisely this area. Of this we will speak at greater length in Chapter II.

Background of a Problem

A thorough understanding of proxemics begins not simply with an investigation of the interaction of the spatial environment with organismic and idiographic variables. It assumes a prior understanding of the plasticity of human nature and the limitless arrays of patterns in which man can organize his functioning in space. The popular works of the anthropologist, E. T. Hall (1955, 1960a, 1960b, 1962, 1963a, 1963b, 1964a, 1964b, 1964c, 1966 and 1969), have been most helpful not only in formulating some of the basic principles underlying the organization that man imposes on his spatial environment but of demonstrating the relativity of much of this organization. In his book, The Hidden Dimension, Hall (1966) cites proxemic research that indicates that the people of the Near East, particularly Arabs, inhabit a different sensory world than the people, let us say, of northwestern Europe. Their senses of touch and smell are much more important to them in monitoring social interactions than are their other senses. They use them for making the finest calibrations in discriminating what is appropriate and what is inappropriate in various social situations. We may

say that not only have they developed these senses to a fine point of acuity, but that they live in a tactile and olfactory oriented world.

The fact that Arabs, for example, emphasize those sense receptors that bring them into immediate or near immediate contact with their environment means that their perceptual world is structured in a much more concrete, existential and immediate way than is that of the northwestern European (if we continue with this proxemically polar opposite of the former). The latter favors the use of his distance receptors, the eyes and ears, and it is these senses more than the others that are used to monitor and control the modalities of social interaction. More specifically to our purpose, they maintain the different distances which are proportionate to the quality of the interpersonal relationship existing between two persons as well as to the nature of their transaction.

Since the eyes and the ears, distance receptors, are the dominant sense organs for northern Europeans, it would seem to follow that their perceptual world is structured differently from that of the Arabs; it is more abstractive, logical, essentialist and objective. This may partially explain why Arabs in their interpersonal relationships regulate distance differently than do Westerners (Hall, 1966; Watson and Graves, 1966). The northern Europeans, in their explorations of the environment, both animate and inanimate, function in a much less subjective and personal way. What is more crucial is that they regulate their relationships in a less immediate way. That is, to a great extent they are loathe to come into physical contact with one another; they may aptly be characterized as non-contact people, just as Arabs are characterized

by E. T. Hall as contact people. Hall graphically illustrates this wide divergence in styles by citing an Arab custom of inviting the fiancée to visit the young man's family so that they may smell her. If she doesn't "smell nice" the family rejects her (1966, p. 160).

Further, because people live in different sensory worlds, and consequently perceptual worlds, they interpret the same objective situations in different ways. There is a selective screening of sensory data and the ideas they may generate. Moreover, qualitatively different kinds of interpretation are imposed even on the same data. Consequently, when people are interacting socially, it becomes important for them to understand the cultural and perceptual parameters that they and others are locked into. The ethologist has a maxim which would well serve the psychologist and the counselor in their professional service and that maxim is: know the perceptual world of the animal you are investigating. Man is an animal whose perceptual world shifts from culture to culture and region to region. It behooves the counselor and clinician to studiously observe this phenomenon. Indeed, this is an integral part of the rationale of this study.

The perceptual world of any person, then, is never a mirror image of reality. For it is a function of many factors: one's personal history from earliest infancy, the acuity of the sense receptors, the shifting canons of social propriety, evolving linguistic styles and syntax (Whorf, 1956). Language, an important correlate of how we perceive our world in all of its dimensions, spatial and temporal, has given shape to the basic categories in which we fit our environment, component by component. It would appear that some of the widest

divergences in sensory and perceptual organization are across language groups.

All of this, of course, has implications for some of our most vexing social problems. If certain segments of the population, let us say, those who constitute our large urban masses, interrelate spatially in a way distinctive from other segments of the population, then not only is this highly useful information, but it becomes imperative to know how they differ in this respect. For example, if we find that the contemporary Black ghetto dweller's language differs significantly in syntax and structure from that of the White suburbia dweller, that he structures his living space and interpersonal distance patterns in distinctive ways, that he dwells in a predominantly tactile, olfactory, audial world, then important consequences follow. It means that White administrators of social programs designed to benefit certain Black groups must be sensitive to the various cultural traits which are woven into the fabric of people's lives and unconsciously and ineluctably determine them to act in stereotyped ways. It means, to become more specific, that in those relationships where Whites play a tutorial role vis-a-vis Blacks, all the proxemic variables which covary with sense dominance and language characteristics must be structured somewhat differently. It means, further, that our aptitude, personality, intelligence and achievement inventories have to be designed in view of the perceptual world of those who will be tested. The applications of this lesson go far beyond the examples just given.

The Problem

The focus of this study has been on certain aspects of the dyadic counseling situation. One of the tasks, if not the only task, of the therapist is to enable his client to function more effectively in his environment. But the modalities of effective functioning vary from subculture to subculture. So the therapist may be making a serious mistake if he indiscriminately tries to teach or model his behavioral styles for his client. Further, to structure the spatial aspects of the entire counseling situation in ways that make the counselor feel comfortable rather than the counselee may also be inappropriate. This is particularly true not only when the client originates from a different ethnic or racial milieu than the therapist; it is true when the therapist is male and the client is female; when the therapist is middle-aged and the client is adolescent.

This study is in the tradition of a growing number of significant studies investigating the relationship of proxemic variables to human behavior in one highly important but specialized eco-system: the interaction of two human beings in a local environment (Haase, 1969, 1970; Haase and DiMattia, 1969, 1970; Jourard and Friedman, 1970; Little, 1965, 1968; Sommer, 1959, 1967, 1969). A great deal of work needs yet to be done in experimentally exploring the effects on dyadic interactions of different and complex constellations of proxemic conditions. This, of course, will be of importance and interest to the counseling psychologist who must be particularly concerned with structuring interviews so as to facilitate, in an optimal way, the entire counseling process.

How then should one structure the spatial environment of an interview or a counseling session so as to foster optimal exchange of information and the growth of a productive relationship? An important part of the structure of such a situation consists of the proxemic dimensions such as distance between interactants, their body orientation vis-a-vis one another, visual and audial factors, fixed and semi-fixed feature space (Hall, 1966; Osmond, 1957; Sommer, 1963). It was the purpose of this study to examine the influence of two of these factors (specifically, the size of the room in which the interview may take place and the distance between dyads) on certain language characteristics and eye movements. A social factor, stress, was added to the research design and experimentally induced on three levels, high, medium and minimal (See Appendix A). The reason why stress was chosen is that the author believes that the prepotent influence on the psychological climate of an interview is the interviewee's (though not infrequently the interviewer's) anxiety. It was felt, however, that it is methodologically sounder to induce transient anxiety experimentally, and so control this factor, than to rely on scales of dubious validity and then assign subjects to a classified factor on the basis of such scales.

It was the author's hypothesis that as the personal "spatial bubbles" of two individuals approach each other and finally intersect, there will be generated a tension or an "energy field" which will have an important influence on the dynamics of dyadic interaction. He further hypothesized that the size of the rooms in which dyads could interact has a direct effect on these same dynamics. That is, it was

suspected that a sense of crowding or of spatial freedom would interact vigorously with the other experimental variables as well as have a direct measurable influence on the criterion variables.

The criterion variables of a linguistic nature were three: (a) fluency of speech (i.e., the proportion of time spent talking by the interviewee), (b) the total number of words uttered by the interviewee, and (c) the velocity of his speech. A number of studies of these language factors within an interview setting have been reported in the literature (e.g., Kanfer, 1960; Matarazzo, J., Wiens, Matarazzo, R., and Saslow, 1968). But none, to the author's knowledge, have examined the effects of the proxemic variables on these interview behaviors.

A fourth criterion variable was the total duration of eye contact between the interviewee and the interviewer during the sessions. There is an abundant literature within the past decade on visual interaction (e.g., Argyle, 1967; Argyle and Dean, 1965; Argyle, Lalljee and Cook, 1968; Efran, 1968; Exline, 1963; Exline and Winters, 1965; Gibson and Pick, 1963; Goldberg and Kiesler, 1969). What is specifically lacking, however, was an experimental examination of the influence of room size on the visual interaction of dyads as well as its interactive effects with the stress and interpersonal distance factors.

This study was undertaken to explore these unknown regions. Its results and their implications can be found detailed in Chapters IV and V.

CHAPTER II

STUDIES AND PRINCIPLES: AN OVERVIEW

In this chapter, a review of the literature which is germane to the principal concerns and the hypotheses of this study will be presented. Its intent is not to be exhaustive. Rather, representative studies have been reviewed, sufficient, hopefully, to establish the credibility of the positions on which this study is based.

The first two sections of this chapter will deal in a synoptic way with the field which has come to be known as proxemics, as it focuses upon the two principal components of this science: territory and interpersonal space. A third section will be devoted to an exposition of the various dimensions of proxemic behavior. Fourth, a section will be devoted to the proxemic variable of visual interaction, and finally, there will be a discussion of a paralinguistic feature of the dyadic interview.

Proxemics and Territory

The field of proxemics has built upon and is, in many respects, interrelated with a number of other sciences. If we define proxemics not simply as a science that studies the way man structures and uses his spatial environment (Hall, 1966) but also the way that that environment is functionally (and lawfully) related to human behavior (Haase and DiMattia, 1969), then it is clear that this science is heuristically implicated in a broad array of other sciences, both applied and theoretical. The reason for this is basic and simple: space is a ubiquitous parameter of all behavior, human or infra-human.

One need only scan the contributions to such publications as Man-Environment Systems or Environment and Behavior or study the composition of the staff of the Department of Design and Environmental Analysis at Cornell University to be convinced of the breadth of the scientific spectrum focusing on problems of a spatial nature. Architects, urbanologists, city planners, psychologists, sociologists, anthropologists, even social biologists and ethologists (Esser, 1970 and Rapoport, 1969) make distinctive contributions to our understanding of the problems defined by the proxemicist.

The study of proxemics is one that has many academic antecedents, but it is more closely related to the behavioral sciences than to others. Indeed, one of the pioneers of this discipline, E. T. Hall, on whom we have relied heavily in this study, is an anthropologist by profession. Central to the study of proxemics are the concepts of territory and territoriality. In developing these concepts and explicating their heuristic value for an understanding of the behavior of organisms, no field has given richer contributions than that of ethology. In particular, the scholarship of Hediger (1961), Lorenz (1955), Tinbergen (1951, 1953), Calhoun (1962), and Christian (1960), have been most useful.

Anthropology of space: a paradigm

Territory has been defined as an "area of space, whether of water or earth or air, which an animal or group of animals defends as an exclusive preserve (Ardrey, 1961, 1966)". Territoriality, a term first

publicized by H. E. Howard (1920) refers to that peculiar behavioral tendency in animals to occupy territory and to mark and defend it from invasion (Carpenter, 1958, Esser, 1970).

Hall (1966) has developed a simple conceptual model for transmuting these notions into an anthropology of space. It has three basic aspects. First, there is fixed-feature space. This comprises the geographical and architectural parameters of human behavior. Certain spatial structures are called fixed-feature because they are frozen over time and can be altered only with great difficulty. In their day-to-day activities, people consider them as the "givens" within which they must function. Examples of this are the "layout of villages, towns, cities and the intervening countryside (1966, p.103)". Even the internal structures of homes in the United States, with their fixed walls and immovable appointments such as fireplaces, counters, heating vents, wall bookshelves, form part of the fixed feature space of Hall's paradigm.

Secondly, there is semi-fixed feature space, which comprises those aspects of space which are structured by furniture and easily movable partitions but which are normally not altered in day-to-day activities. For sufficient reason they can be altered, however. This depends on how one wants to structure the relationships and the character of the interpersonal interactions which are going to materialize within and about these features. For example, large chairs which are normally not moved in a club room, can be placed further apart in the event of a public and formal meeting (Hall, 1963).

The third element in this conceptual model is "dynamic" or "informal" space. It comprises those spaces which are relatively

devoid of physical structure but in which there are deep, rigid and emotional-laden boundaries or patterns, many of which are unvoiced and unconsciously perceived. However, these boundaries are numerous and varied depending on the multitude of qualitatively different transactions which may take place within them. Furthermore, these boundaries, like the dimensions of semi-fixed feature space, are culturally determined. For example, Mediterranean, Japanese, and Scandinavian cultures differ widely in the size of the various zones in which they permit the same transactions to take place.

Sociology of space: a paradigm

A different model has been proposed by Lyman and Scott (1967), in a sociological perspective. They speak of (a) public territory, (b) home territory, (c) interactional territory and (d) body territory. Public territory comprises those areas where all individuals have freedom of access but not complete freedom of behavior. Examples of this are parks, streets, national forests and playgrounds. There, codes of public behavior are relatively constraining and rigorously enforced. Home territories are areas where certain segments of the population feel that they, but not others, have privileged access. Since these groups form quasicultures distinct from the rest of the population, they experience a greater sense of intimacy and are granted a greater freedom for idiosyncratic behavior. Examples of this are hobo jungles, homosexual bars, ethnic clubs, restaurants that cater to writers, or theatre-goers. Interactional territories are any areas where social gatherings can occur. They may be sheltered or open air,

in one's home or in a pavilion or public park. Body territories are the spaces encompassed by the human body. However, the space immediately surrounding a person is so identified with him, that one may be said to violate a person if, unbidden, one significantly violates his personal space. This dimension of Lyman and Scott's paradigm corresponds to the spacing phenomenon that Hall describes as a bubble or series of concentric bubbles enveloping an individual. In passing, it may be interesting to note that schizophrenics, who perceive intrusion in a more instinctive, less acculturated way than normal persons do, describe events taking place within their personal space as literally taking place within themselves (Hall, 1966, p. 11).

Salient to Hall's as well as to Lyman and Scott's paradigms of the way man structures the spatial dimension of his interpersonal relations, is an implicit, unconscious territoriality. What they are saying is that man organizes his spatial relationship vis-a-vis other persons in a non-reflective way. Moreover, the territoriality is relative in that it is not the demarcation of fixed boundaries. Rather it is the territoriality of the man who lives in a houseboat and floats about asserting rights to space only relative to where he happens to be, not to where he was or will be.

There is another paradigm which Hall proposes. This is a model of how men structure the third aspect of microspace, to wit, dynamic or informal space. This paradigm forms part of the theoretical basis of this study. However, it can be more appropriately treated in the section dealing with interpersonal spacing.

Some ethological findings

It may be useful at this juncture to allude briefly to the work of an ethologist, Heini Hediger, whose investigations of various species of birds and other wildlife anticipated the studies of many of the behavioral scientists we will rely on in this study. This should surprise none but the naive since much more has been known about animal than about human spatial behavior (Sommer, 1969, p. 12). A cautious use of zoological and ethological findings can be helpful at least in suggesting comparable studies among people.

Hediger describes four interaction distances among animals. They are (a) flight distance, (b) critical distance, (c) personal distance, and (d) social distance. The first, flight distance, is a function of how close a member of one species will allow itself to be approached by a member of another, predatory, species before taking flight. Critical distance is a corollary of flight distance. Indeed, it is conceived as a zone separating the line at which an animal will take flight from the line at which it will attack its predator, if flight is impossible. Personal distance is the spacing that members of the same species maintain among themselves. This, of course, varies widely from species to species. Some organisms, such as the walrus, the pig, the parakeet, sleep nestled against one another and interact by physical contact with one another. These are called by Hediger "contact species". Other species, such as the horse, dog, rat, most birds, do not huddle together except in infancy. These are called "noncontact species" for they maintain a rigid spacing pattern among

themselves. A corollary of personal distance is social distance. This regulates the cohesiveness of the group and assures the individuals of the security of the group. If individual members stray from the main body, they more easily fall prey to their natural enemies.

These concepts, particularly the latter two which deal with intraspecies spacing, are of particular usefulness to the behavioral scientist. Reference will be made to this in the section dealing with interpersonal interaction distances.

Crowding among animals

The geometrical expansion of the world's population and all that that implies in terms of human adaptation to a relatively diminishing lifespaces has been largely responsible for the burgeoning science of human spatial behavior. In fact, ecology, an umbrella term for all studies dealing with the complex biophysical interrelationships of organisms and their total environment, owes its impetus to the impact and consequences of an expanding population on limited resources, the pre-eminent resource being space (Hawley, 1961).

It will be of value to consider a number of studies on crowding and the pathological consequences of this disorder in order to understand the dynamics of human and animal behavior not only under unfavorable but also favorable spatial circumstances. Using a pathological as well as hygiological approach in this area has the same methodological values as studying, for example, childhood traumata to understand adaptive as well as maladaptive interpersonal functioning.

The term "crowding" has been defined as "a conscious or unconscious

experiencing of the stress of inappropriate social encounters (Esser, 1970, p. 3)". A number of celebrated ethological studies (Calhoun, 1962; Christian, Flyger and Davis, 1960; Davis, 1958) point rather conclusively to the fact that when crowding is experienced in severe forms and over a period of time, pathology of a social, psychological and, not surprisingly, physiological nature results. Numerous studies of crowding in cities and human habitats point generally in the same direction (Chombart, 1959a, 1959b; Freedman, 1970; Harrington, 1965; Hutt and Vaizey, 1966; Levine, 1962; Plant, 1930; Rapoport, 1969; Schmitt, 1966; Wilmott, 1962). However, the methodological problems in human studies are more formidable than in animal studies and the conclusions are consequently more ambiguous. A problematical methodology arises from a number of factors, e.g., inability to control the experimental laboratory with rigor, the ethical (and commendable) bias against manipulating persons experimentally, the greater plasticity and adaptability of human behavior.

There seem to be two regulatory mechanisms for dealing with the dimension, "population density". They are, in fact, methods of structuring the environment to reduce the abrasion of continual competition for living room. One method consists of coding the physical environment territorially, the other coding the social environment hierarchically (Esser, 1970).

Davis (1958) comments on these coding mechanisms:

"The relation of territory to social rank has puzzled zoologists for many years and this paper cannot settle the question. However, an hypothesis for testing may be advanced: territorialism and social rank are two

poles of a continuum of behavior that is dependent on density. At all densities the individuals arrange themselves in a rank, but at low densities the groups tend to be smaller so that at the lowest density each 'group' consists of one animal who thus has a territory and who is naturally dominant (p. 209)."

But what happens when density becomes excessive and goes beyond the endurance of the species? An answer may have been provided by two celebrated studies, one naturalistic, one experimental.

The former (Christian, Flyger and Davis, 1960) resulted from the population growth of a herd of Sika deer on a small island in Chesapeake Bay. From an original four or five released on the island in 1916, they grew to a herd that numbered in 1955, close to 300, or about one deer per acre. John Christian, years before, advanced the thesis that population growth was controlled by endocrine reactions to density. He saw a chance to test his thesis on St. James Island. He shot several deer and did histological studies of their glands and organs. Several years later, in 1958, over half of the island deer population mysteriously died; the following year another substantial decrease took place for no apparent reason. The population finally stabilized around 80.

The results of further histological studies revealed that the dead deer had been young, well-nourished and in excellent condition. But important changes were apparent in the cell structure of their adrenal glands. Christian, concluding that the deer died from stress induced from population density, stated:

"Mortality evidently resulted from shock following severe metabolic disturbance, probably as a result of prolonged adrenocortical hyperactivity. Judging from histological material, there was no evidence of infection, starvation or other obvious cause to explain the mass mortality (quoted by Hall, 1966, p. 21)."

A study which has more serious implications for men was that done by Calhoun (1962) in which he allowed a colony of Norway rats to multiply freely in a restricted area. The crowding that resulted created serious social and physiological disorders. Aberrant behaviors by the males became standard. They went "berserk, attacking females, juveniles and the less active males.... biting other animals on the tail (p. 146)." Another group of males became pansexual, incapable of discriminating between appropriate and inappropriate sex partners. A group of males called by Calhoun "probers" became hyperactive, hypersexual, homosexual and ultimately cannibalistic. The females suffered a high mortality rate from pregnancy and parturition disorders. As many as 96% of the infants in certain experimental rooms died before weaning. The pathologies, social and physiological, were so rampant and severe that Calhoun was moved to describe the result of the crowding as a "behavioral sink". These conclusions and the related conclusions of Christian, Flyger and Davis were supported by John Christian's study with mice (1961).

Crowding among people

Comparable studies in human overcrowding are of course absent. An abundance of anecdotal evidence as well as ex post facto studies exists to convince us that overcrowding among human beings does induce deleterious effects in the social, psychological and physiological realms.

Irving Rosow (1961) adduces evidence to show that space is more important than mechanical features in the living environment of different socio-economic classes. He speaks of "livability" as the

opposite of those qualities which conduce to social pathology. The predominant factor in "livability" is space which affords the possibility of privacy and the differentiation of spatial functions. He cites a startling example of this (from Festinger, Schacter, and Back, 1950). In a housing project where countless structural and mechanical failures (e.g., leaky roofs, faulty plumbing, muddy lawns) plague the tenants, the spatial ecology of the apartment complex, which afforded privacy as well as opportunities for social interaction, proved far more important. The tenants were happy there.

Molly Harrington (1965) in an important study demonstrated the stress and frustration resulting from tight dwelling quarters in working class districts of Edinburg and Leith, Scotland. Part of the stress results from broad assaults on ego functioning and integration, particularly of the wife and mother. The home carries significance at all levels of the personality and may be regarded as an extension of the self of the resident, an arena for the exercise of choice which permits ego expansion and consolidation. This can only happen if there is enough space for spatial differentiation of domestic functions. When the kitchen becomes a bathroom, lavatory, living room, furnace room as well as kitchen, intolerable ambiguity and conflict arise in the conduct of the simplest activities. Harrington states:

"... access to increased space and the possibilities of differentiated function in space within the home led to a relaxation of the distance keeping code. The acquisition of space is also accompanied by a tendency toward greater conjointness in the marital roles and increased permissiveness with children (p. 136)."

Studies in France, notably those by Chombart de Lauwe indicate that

social and physical pathologies are significantly correlated with degrees of crowding in working class living quarters. Below 8 to 10 square meters per person, significant increases in pathology occurred. Between 8 and 14 square meters pathology was lowest. Above 14 meters it began to rise. Chombart opined that the reason for the latter finding was the relative neglect of children in the upwardly mobile families living in working class districts.

It is important to note that human response to stress admits of considerable fluctuation from culture to culture. Nevertheless, LeVine's studies of native cultures in Africa (1962) and Schmitt's work in Honolulu (1966) point in the same direction regarding toxicity of crowding and high population density.

It may be useful to allude briefly to several studies relating to crowding in the total institution. Esser (1970) takes for granted the gross pathological effects of crowding and examines it in relation to the behavior of mental patients in a research ward. He found, among other things, that greater structuring of living experiences in a crowded milieu (e.g., conducting sheltered workshops) reduced expression of pathology outside of working hours.

This finding is congruent with another study done by Esser, in collaboration with Chamberlain, Chappel and Kline (1965) in which it was found that rigid coding (i.e., structuring) of the social and physical environment reduced aggression. Their data showed that a person's instability in the dominance hierarchy and his non-possession of a territory are both related to aggressive behavior. Conversely, a person whose position in the hierarchy is established and yet who

does not occupy a specific spot will not show aggressive behavior. There are, of course, personality "constructs" that are operative here also and can mitigate or exacerbate these findings.

Hutt and Vaizey (1966) discovered that normal children "showed progressively and significantly less social interaction with increasing group size (p. 1372)." They also showed similar increases in aggressive/destructive behavior. Brain-injured children exhibited more aggressive/destructive behavior in high density conditions as well as more time spent in social interactions.

Proxemics and Interpersonal Space

The proxemic event

Another important dimension of man's spatial behavior is the complex of modalities by which he regulates the distance which separates (or unites) him and his fellows. Hall (1963b; 1966) attempted to systematize our rudimentary understanding of these modalities. On a molar level he divided all proxemic behavior into a total of eight classes or events. Of these he observed that they were "sufficient to describe the distances (and the means of determining distances) employed by man. The systems are biobasic, rooted in the physiology of the organism (1963b, p. 1007)." These dimensions of proxemic behavior are:

- (a) posture
- (b) Sociofugal-sociopetal axes (SFP), i.e., the relation to one another of the planes of the shoulders of two persons

- (c) kinesthetic factors - a physical distancing dimension giving "potential to strike, hold, caress or groom"
- (d) touching among two persons
- (e) looking, or eye contact, between two persons
- (f) thermal events (heat sensing between persons)
- (g) olfaction (odor sensing between persons)
- (h) loudness of voice

Plainly, whenever two persons interact all these factors may not be operative. Olfactory and thermal inputs require, normally, that two persons be close. Voice loudness depends, of course, on verbalization. Retinal combinations require that one, at least, be looking at the other. Whichever factors, however, do function, function in terms of regulating the psychological distance between persons. They are distance (and density) dependent regulatory mechanisms. Leibman, indeed, (1970) sees personal space as a psychological construct. Given the entire phenomenal situation of an interactant with mood, attitude, relationship, task, and personological variables, there is an optimal zone of comfort proxemically. When one or another proxemic factor is altered, an adjustment is made by the compensatory alteration of another factor. A simple illustration of this would be the alteration of the kinesthetic dimension in a crowded subway or elevator. A compensatory adjustment might be to close one's eyes or face the wall. This, in effect, is the homeostatic model of proxemic behavior proposed by Argyle and Dean (1965).

Interpersonal space: a paradigm

On a molecular level, Hall (1966) has designed a paradigm which

is most useful for conceptualizing the nature of the relationships and activities which normally prevail at certain physical distances. The population that Hall used for norming the distances was a non-contact, middleclass, normal resident of the northeastern seaboard of the United States.

The paradigm consists of four distances, which constitute zones of interaction: (a) intimate distance, (b) personal distance, (c) social distance, and (d) public distance. Each of these distances is divided into a close and a far phase.

The intimate zone reaches from body contact to 18 inches. The close phase (0 inches to 6 inches) is appropriate for highly intimate transactions such as comforting, protecting and lovemaking. The far phase (6 to 18 inches) is a transition phase to the personal zone. It is reserved for those who are called (appropriately) "intimates". If a simple acquaintance, or even more, a stranger moves into this zone, it causes a good deal of psychological discomfort and tension. It is this phenomenon which has generated the concept of psychological "bubbles" which envelop a person in concentric spheres and which he carries about with him. These psychological "bubbles" and, indeed, the concept of psychological distance itself are an ingenious hypothetical construct for understanding how man projects his ego beyond the boundaries of his body and relates himself spatially to an encroaching, and impinging, environment.

Included within the "bubble" is the zone designated personal by Hall (which is analogous to "personal distance" as described by Hediger). The near phase of personal distance is from 18 to 30 inches. Within

this zone there can enter, on appropriate occasions, friends and relatives. Within this zone one can easily touch or grasp another. But the criterion of intimacy is not as stringent here as in the intimate zone. The far phase of this zone, on the other hand, puts one generally at arm's length from another; this phase extends from 30 inches to 48 inches. Within it one symbolically moves out of the range of easy physical domination of one person by another.

Social distance, close phase, extends from 4 to 7 feet. This zone accommodates transactions of a business-like and impersonal nature. The far phase, 7 to 12 feet, is appropriate for more formal, impersonal and noninvolved interactions; conversation is louder; eye contact becomes more important. Public distance, close phase, 12 to 25 feet, generates changes in voice, syntax and visual contacts that are appropriate for interactions which are highly formal and minimally involving. This is also characteristic of the far phase (beyond 25 feet), but to a greater extent. This latter distance is appropriate for public speakers, for actors or any persons on public occasions.

The cross cultural factor

These interpersonal zones not only have biological determinants (e.g., the length of the human arm, the acuity of the sense of smell) but also some unmistakable cultural determinants (Hall, 1959; Little, 1968; Watson and Graves, 1966). Unlike infra-humans, men enjoy a high degree of plasticity in terms of modifying the pattern of behaviors that are used in adapting to changing and, often, threatening environments. Little (1968) studied social spatial schemata among five

nationalities: Greeks, southern Italians, United States Americans, Scots and Swedes. Surprisingly, there was no significant difference between the Americans and the Italians in positing social interaction distance. (This renders suspect the facile assumption made by Hall and others that the "American" lives culturally in a predominantly Anglo-Saxon tradition.) In terms of proximity of social interaction the study resulted in the Greek group manifesting the closest interpersonal distance; second came the Americans and the Italians; third and fourth were Swedes and Scots respectively. In Watson and Graves' study (1966) patterns of spacing in varying social contexts were seen to diverge significantly between American and Arab students.

The fact of cultural relativity hardly needs to be belabored. What does need to be emphasized is the need for more studies of regional, subcultural and racial differences within the broad geographical or national context. Until these are done, the experimenter must be wary of generalizing beyond the population specifically represented in his sample.

The infracultural determinants of spacing in human beings (i.e., those determinants which are genetic and paleobiological) as well as the physiological parameters within which we interact are all relevant to this study but fall outside its scope. The curious and motivated reader is urged to consult, for a start, Chapters 4, 5, and 6 in Hall's The Hidden Dimension, for a general overview of these parameters.

Invasion of personal space

Invasion of personal space may be regarded as an unsolicited and

unwanted penetration of one's personal space by another person. It generates, at least in one of the parties, feelings of embarrassment, tension, and even panic. Garfinkle (1964) reports a study in which a confederate was instructed to bring his face up to another "until their noses were almost touching". The characteristic responses were "attempted avoidance, bewilderment, acute embarrassment, furtiveness, as well as uncertainties of fear, hope and anger". Furthermore, the subjects usually proved irreconcilable about the indignity and violation of their space even when the experimenter explained his purpose.

Felipe and Sommer (1966) cite several authors (Birdwhistell, 1952; Garfinkle, 1964; Goffman, 1963; Sommer, 1959) who investigated the effects of intruding into the personal space of an individual. They regarded this as an indication of interest in norm violations and responses to it. In their own study, Felipe and Sommer instructed experimenters to sit within 6 inches of the subjects who were inmates of a mental hospital. They selected those inmates who were seated in isolation. The result was that subjects departed (i.e., fled) the scene significantly sooner than did the controls. In a second study, it was found that a similar strategy was adopted by students whose personal space was invaded at study tables by some impertinent experimenters. They departed.

It perhaps goes without saying that any behavior that causes discomfort or excitement in another generates some concomitant physiological reactions. An experimental verification of this was made by McBride, King and James (1965) in which they found that galvanic skin responses (GSR) of subjects were higher, the closer a confederate

approached them. Visual space proved to be an important dimension of personal space for the GSR was lower when the subjects were approached from the side and least when they were approached from the rear.

This raises the tangential question of whether personal space can be invaded in any other way than corporally. A case can probably be made for the opinion that staring can be an invasion of personal space. Exline and Winters (1965) suggest that decreased eye contact serves to increase social distance. The inverse then would also be true, that increased eye contact serves to decrease interpersonal distance. In any event, Kleinke and Pohlen (1971) demonstrated that subjects in a "gaze condition" rather than "no-gaze condition" had significantly higher heart rates. The inference one might make here is that the behavioral correlates of invasion of personal space in a corporal manner (i.e., heightened physiological reactions, embarrassment, flight) are the same as "invasion of personal space" by gazing.

Finally, it will be appropriate to say a word about what is necessary for an "invasion." It would seem that only persons, or at least only humanoids can invade personal space. Corroborative of this view are the findings of Horowitz, Duff and Stratton (1964) who demonstrated that both schizophrenics and nonschizophrenics would approach inanimate objects (such as a coat rack) more closely than they would approach persons.

Organismic variables and human spacing

The determinants of the patterns of spacing are manifold. It may be taxonomically useful to divide them into organismic variables

on the one hand and socio-situational variables on the other. Intuition and everyday experience suggest to us that the various ways a person approaches and interacts with another, or others, is to a certain extent a function of his temperament, his attitudes about others, his mental health and other basic personological features. For example, Horowitz (1965) wrote, apropos of this, that "psychotherapists who are more successful with schizophrenic patients appear to have relatively less rigid attitudes toward the structure of space in experimental situations than those who are less successful (p. 21)". He concluded that human attitudes, needs, and behaviors in relation to space should be more closely studied.

Rosenfeld (1965) demonstrated that women who seek approval position themselves significantly closer to another, also a woman, than if they were avoiding approval. Further, the approval-seeking subjects placed themselves on the near or confidential side of conversational distance; the approval-avoiding subjects placed themselves on the public, more formal side. Rosenfeld (1965) states that "in nonconstrained or informal interpersonal situations, proximity may function psychologically as an indicator of positive interpersonal affect". Proximity serves, further, "as an instrumental affiliative act, i.e., as a means of winning the approval of other persons (p. 120)".

Little, Ulehla and Henderson (1968) found in a silhouette figure placement experiment that if "members of a dyad shared similar beliefs or values, their interactions would take place at a closer distance than if they differed in their beliefs or values (p. 250)".

Mehrabian (1968) found in a number of experiments that "greater relaxation, a forward lean of trunk towards one's addressee, and a smaller distance to the addressee communicate a more positive attitude to the addressee than a backward lean of posture and a large distance (p. 307)".

Leipold (1963) found that the personological variable, introversion-extraversion, was influential in determining distance between dyads. Extroverts tend to interact at a closer distance than do introverts. In a more intensive study, Haase (1969) discovered that a combination of 9 of the 24 personality variables in the Adjective Check List (ACL) are significantly related to an individual's preference for interpersonal interaction distances. Although he admits certain intrinsic limitations to the study, Haase gives a tentative

"personality description of the person who prefers to interact at greater distances with others. A synthesis of the clinical interpretations of the variables used in this study would suggest that such a person is intellectually oriented, contemplative, more reserved and retiring, self-controlled, individualistic and independent. He is a person who displays a need to function in a status-oriented, supervisory position vis-a-vis others. He is also a person who is prone to anxieties and self-doubts and lacks self-confidence and the ability to cope effectively with his environment in the everyday sense (p. 9)".

Social-situational determinants of spacing

A prepotent determinant of spacing patterns is the relationship that exists between two or more persons who are interacting. Kenneth Little (1965) demonstrated in an important study that people who perceived others as friends "positioned" them at a closer distance than

if they were simply acquaintances. Strangers were seen as interacting at even a greater distance than acquaintances. Further, Little made the notable discovery that "setting" has a similar influence. "Maximum distances occur in an office waiting room; minimum distances vary, but with the strong suggestion that a street corner or similar open air setting will elicit the closest interaction distance (p. 244)". There is partial corroboration of this last finding by Sommer (1961), to wit, the larger the room in which persons are involved, the closer they will sit towards one another.

It was not a surprising finding that setting has an influence on interpersonal spacing. Osmond, in 1957, had already spoken of spatial settings that fostered interpersonal involvement (these he called sociopetal) and settings that hindered interpersonal involvement (and these he called sociofugal). Sommer and Dewar (1963) and Sommer (1967, 1969) studied the impact of various fixed and semi-fixed feature settings on personal interactions. Their conclusions, which go beyond the scope of this study, regarding a host of institutional settings (e.g., taverns, airports, geriatric wards, offices) are that, frequently, design works at cross purposes with function.

Status is another significant determinant of distantiation (Goffman, 1961; Hall, 1969, Lott and Sommer, 1967; Mehrabian, 1968; Sommer, 1961, 1969; Strodtbeck and Hook, 1961). Suggestive of the general import of these studies is that of Lott and Sommer. They found that peers arranged themselves "closer together (at a table) than individuals of disparate status (p.94)". They found, further, 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 table positions with status levels, as well as the location of another person already seated (p. 94)".

Visual Interaction

Of the various classes of proxemic behavior by which man distantiates himself from his fellows, there is one which is of particular importance: visual interaction. Basing himself on J. Gibson (1950) and Y. LeGrand (1957), Hall states that the "role of vision in judging distance and in communication is incredibly complex..... Depending on the source one chooses, and using the size of the channel of the brain as a rough index of capacity, the eye feeds from 6 to 20 times as much information to the brain as the ear (1963, p. 1012)". Hess, writing in Scientific American (1965), aptly states that "Embryologically and anatomically, the eye is an extension of the brain; it is almost as though a portion of the brain were in plain sight (p. 52)" for the other to peer at. Without doubt, visual interaction is the most sensitive, complex, subtle and powerful of the proxemic events.

Eye contact in infancy

From earliest infancy visual interaction is one of the most important communicative modes available to a person. Robson (1967) refers to it as an innate release mechanism (IRM) for maternal care-taking responses: "Vision is the only modality which, by closure of

the eyelids, gaze aversion and pupillary constriction and dilatation, is constructed as an on-off system that can easily modulate or eliminate external sensory input, sometimes at will, within the first months of life (p. 13)".

The intensity and cogency of visual interaction is present in early infancy and the maternal eye-gestalt becomes the salient sign configuration in the child's world. For the child, visual interaction becomes a kind of reciprocal intercom system which can operate from distant rooms. The importance of this interaction can hardly be exaggerated. Eye-to-eye contact often dominates the feeding situation so that the child is distracted from sucking. In terms of body-image, eyes have a salience that no other organ has. "Shapiro and Stine (1965) collected the figure drawings of three- and four-year old children in order to test the primacy of mouth perceptions. In their younger sample, less than 46 months old, 89 percent drew eyes while 22 percent drew the mouth (Robson, 1965, p. 17)". And even within the first three months, a child when spoken to will fixate not on the mouth but on the eyes of the speaker. In terms of the sedative or arousal strength of eye contact, Robson points out that "... a mildly upset baby can be quieted through eye contact but an infant that is fussing or crying either averts his gaze or, if he makes contact,... often becomes more upset (p.21)".

Eye contact as social stimulus

Eye gaze, in and of itself, appears to be an arousal stimulus, further, a patent social stimulus. This principle is exemplified in

a study by Milgram (1965). The cogency of the face-to-face, visual confrontation is poignantly illustrated. It was shown that subjects were more disposed to disobey orders to inflict painful and injurious electric shock on an innocent third party when orders were issued by phone and not face-to-face. Gibson and Pick (1963) demonstrated that animals and children are highly sensitive to being observed. Wada (1961) demonstrated that when rhesus monkeys are looked at by a person, the level of electrical activity in the brain increases; when the other's gaze is averted, electrical activity declines. Collaborative findings were presented by Kendon (1967). He stated that gaze and emotional arousal are functionally related; subjects in a "gaze condition" had significantly higher heart rates. Behavioral correlates also emerged: e.g., speech become more rapid and fluent. C. Kleinke and P. Pohlen (1971) support Kendon's findings.

Congruent with these findings are the related findings of Argyle and Dean (1965) and Goldberg, Kiesler and Collins (1969). They showed that the closer dyads come to one another, the less time they spend gazing at one another. If eye contact is an arousal stimulus, it does not seem unlikely that the closer two persons come together, the more discomfort and tension would induce some compensatory adjustment in proxemic patterns. As indicated above, social distance can be shrunk or extended by the greater or lesser use of visual interaction.

It is significant that individuals who suffer some impairment of their interpersonal skills and capabilities indulge in an abnormal amount of gaze-aversion. The autistic is such a person and gaze-aversion

is a consistent element of the syndrome (Kanner, 1944). Nash (1970) reports a number of studies supportive of this finding. One of the most important is a study by Hutt and Ounsted (1966) in which they presented autistic children with models of a happy and a sad human face, a blank outline of a face, and a monkey's and a dog's face. Strangely, they spent most of their time investigating the blank face and "avoided contact with the human faces, especially the smiling one (p. 68)". Further, "In an attempt to discover what parts of the face were most aversive to the autistic children, faces were presented lacking mouths or eyes. The latter were avoided more than the former (p. 68)". Indeed, the less human the face appeared, the more the autist favored it over others. Hutt and Ounsted (1966) wrote that the autist is intent on reducing interpersonal input to a maximum. Gaze aversion is an effective device.

If the autist and others suffering lesser degrees of interpersonal malfunctioning wish to avoid eye-contact, the question naturally arises: under what conditions do normal persons seek eye-contact and why? A representative answer is given by Argyle and Dean (1965) and Argyle, Lalljee and Cook (1968). Briefly, they assert that visual scanning and eye-contact serve three purposes: (a) They provide feedback on the attention, the direction of focus, the attitudes and the emotional state of the other. Argyle and Kendon (1967) proposed an interactional model which is simply a serial motor skill in which each is modifying his behavior on the basis of cues he perceives in the other. (b) They enable interactants to synchronize their speech. For example, Kendon states that if one does not look at the listener at

the end of an utterance, the listener delays his response. In other words, a terminal look signals the end of the utterance. (c) They provide an affiliative balance since the degree of eye-contact indicates the intensity of involvement or concern. It may, for example, be affiliative/sexual; it may be dominative/competitive. A characteristic result of one interactant's partial invisibility (i.e., having more visual information than the other) is that he tends to dominate the encounter, feel more comfortable, become the observer.

Interaction of eye-contact and attitudes

Persons vary the frequency and duration of their eye-contacts with others as a function of (a) how they conceive others' evaluations of them and (b) how they evaluate others. Exline and Winters (1965) found that subjects increase the frequency of eye-contacts with an interviewer evaluating them positively and reduce eye-contact with an interviewer evaluating them negatively. Further, their studies showed that after they, the subjects, had expressed a preference for one or two interviewers, they engaged the eye of the preferred significantly more than the nonpreferred, when both were present.

It was discovered that a high degree of eye-contact profoundly influences a person's affective response to an experimenter. Ellsworth and Carlsmith (1968) conducted a study in which they found that a high degree of eye-contact by an experimenter heightened the subject's dislike of him if he was critical, and heightened the subject's liking for him if he was friendly and favorable. Strangely, however, they liked the critical interviewer who did not look at them more than the friendly one who likewise did not look at them.

Efran (1968) studied the influence of status and approval seeking on subjects' eye-contact. He found that the latter was increased as status and approval seeking increased. Exline, Gray and Schuette (1965) discovered that visual interaction is sensitive to the sex of the interactants as well as to the content of the verbal interchange. When those topics which normally cause embarrassment in the North American culture were discussed with a member of the opposite sex, they significantly depressed the amount of eye-contact between dyads. Exline (1963) found that men manifest greater restraint in eye-contact than do women. Persons, moreover, who are high in affiliation (i.e., a disposition toward close interpersonal relations) are inclined toward more mutual interaction. Further, unlike highly competitive persons, their eye-contact is reduced proportionately to the competitiveness of the situation.

Modigliani (1971) got experimental results which showed that persons who experienced a public failure decreased their level of eye-contact during "their embarrassing postfailure interaction". By contrast, subjects experiencing public success slightly increased their level of eye-contact during postsuccess interaction.

The Interview

"Researchers clearly have long known that the very essence of diagnostic interview and psychotherapy material - interview content - is carried by duration of communicative action (utterances) and silence (Matarazzo, Wiens, Matarazzo and Saslow, 1968, p. 353)". What they have also long known is that the environment has a profound influence

on the dynamics and process of dyadic interaction. Anomalously, little has been done up to the present (Wohlwill, 1970) to investigate what that influence was and how it could be manipulated to good effect. The main thrust of this study in proxemics was to investigate how duration of utterance and verbal velocity are influenced by the common features of the environment. It was decided to use the interview format as the vehicle for this investigation.

The interview, as a research tool, has a creditable if stormy history. Verbal operant conditioning studies utilizing the paradigm proposed by Skinner (1957) began to appear in the literature in the early fifties (e.g., Greenspoon, 1954, 1955; Cohen, Kalish, Thurston and Cohen, 1954). These studies proliferated in the following years. By the late fifties Krasner (1958) was able to review upwards of 100 studies of considerable importance in the area of verbal behavior and many of them were cast in an analog interview format.

A serious problem in studies using the interview as the tool or medium of investigation (Goldman-Eisler, 1952) is that the interviewer brings a multitude of uncontrolled variables into the laboratory with him: his own distinctive personological features as well as the cognitive and attitudinal sets generated by his professional orientation. Every interviewer is different, not only in his behavior but most importantly, in the kinds and quality of behavior that he elicits from any subject. An attempt to control this has been made by Chapple (1953) and the standardized interview format he developed for this purpose has been widely used. It involves, most basically, a rigorous structuring of the interview into periods, in which latency of

interviewer interventions, duration of responses, responses to interruptions, salient nonverbal behavior and the quality of interviewer interventions (e.g., they must be nondirective, nonchallenging, open-ended) are all rigorously controlled.

To date, no investigators have so thoroughly investigated the possibilities of the interview as a methodological tool as have Joseph Matarazzo, Ruth Matarazzo, Saslow and Wiens. The rigor, thoroughness and intelligence of this team of researchers permits us to rely with confidence on the conclusions of their lengthy studies. A rather complete review of the first eleven years of their research in this area can be found in Matarazzo et al (1965).

They found in their earlier studies that "(a) without any interpolated activity by a therapist or other interviewer, the speech behavior of any individual patient would be similar from test to retest and (b) with some interpolated activity (e.g., head nodding....) we had a reasonably good chance of both producing change in the variables we had chosen and also measuring such changes (Matarazzo, J., Wiens, Matarazzo, R., and Saslow, 1968, p. 347)".

Further, they demonstrated "that the interview speech and silence behavior of any given individual is highly reliable for him despite large individual differences in these speech characteristics from one interviewer to another (1968, p, 352)". If the interviewer does not alter his speech durations then there will normally be no change in the speech duration of the interviewee, other things remaining unchanged. However, striking changes in interviewee utterances can be made by the interviewer's (a) increasing or decreasing his speech duration, (b) nodding his head and (c) saying mm-hmm (Saslow and Matarazzo, 1959).

A multitude of studies have been done in the sixties on verbal process in the interview and the psychotherapeutic session (e.g., Meltzoff and Kornreich, 1970, pp. 403-448; Gottschalk and Auerbach, 1966, pp. 70-153). Most of them are tangential to the particular interests of this study. Few of them, to our knowledge, dealt directly with the influence of proxemic variables on verbal behavior.

Two are of particular interest in view of the nature of this study. Kendon (1967) found that speech while looking at another person is more rapid and more fluent. Since gaze and emotional arousal are functionally related, it is possible that it is the emotional component in the transaction that mediates changes in verbal velocity. The relationship between speech rate and emotionality was established earlier by Boomer and Dittman (1964). Even earlier (Kanfer, 1959, 1960), investigations revealed that verbal rate was a function of the anxiety level generated by social-situational factors. In the earlier study Kanfer asked 29 students to give three-minute monologues on each of five topics. He found that verbal rate was highest when the subjects spoke on the topics assumed to be most stressful. This finding was corroborated in the later study (1960) in which psychiatric patients evinced the highest verbal rate when they spoke about their illness (also assumed to be the most stressful topic).

Manaugh, Weins and Matarazzo (1970) found that motivational set (in this experiment, a set to deceive an interviewer) significantly influenced noncontent and silence behavior. In this motivational set subjects increased their mean duration of utterance and reduced their reaction time latencies, i.e., the lapse of time following the last

interviewer intervention. It is difficult to conceive of topics which are not charged, at least minimally, with some surplus meaning and some emotional connotations. Even a self-selected interview topic will have some emotional salience affecting noncontent verbal behavior.

Stress

The final area to be broached is that of stress as it relates to the other variables under study here. Relative to the total study, it is of tangential interest, but it is an integral part of the research design. Consequently, it is appropriate to treat it briefly in this context. As it was pointed out in the introduction, anxiety, whether conceived in behavioral or analytic terms, is an important ingredient in the counseling process. For the analyst it is a personality dynamic which is useful in the therapeutic process itself; for the Rogerian (or a variety of other counseling "schools") it is a manifest behavioral datum that should be dissipated.

It has been assumed in this study that stress is a social-situational factor that is perceived by a vulnerable individual as a threat to his well-being and which inevitably has some emotional correlates. Working on that assumption, this study was partially designed to investigate which behavioral correlates emerged in an interview situation in terms of verbal fluency and eye contact.

Several studies have been cited above (Boomer and Dittman, 1964; Kanfer, 1959, 1960; Kendon, 1967; Manaugh, Weins and Matarazzo, 1970) which treat this issue specifically. All of them indicate that verbal

behavior is partially a function of emotional arousal. More specifically they indicate that verbal fluency and velocity are heightened, within limits, as a function of increasing anxiety.

Anxiety, furthermore, has been shown to be a function of several parameters within the interview itself, although the results of studies of this issue are not all consistent. Gottschalk et al (1966) have demonstrated a sophisticated methodology for measuring changes in certain emotional states, during interviews, by an analysis of verbal behavior. But the principal thrust of the methodology was for an analysis of patient (and therapist) verbal content rather than on such paralanguage features as pitch, volume, tone of voice, accent, cadence, stress and so forth. This is also true of the work of other investigators who have attempted to relate verbal behavior to affect states (Gottschalk et al, 1966, p. 97).

However, in addition to the studies alluded to above, there have been several studies of more than tangential relevance to this paper which it may be useful to review. A study conducted by Dibner (1958) indicated that the more ambiguous the interview, the greater the anxiety manifested by the subjects. Subjects were dichotomized; the members of one group were introduced singly into a structured, guidance-type interview; the others experienced an unstructured session. Measured by palmar skin conductance, clinical judge ratings of taped sessions, subject self-reports and speech disturbance, the results indicated that the more structured the interview, the less anxiety became manifest.

A related study was conducted by Pope and Siegman (1962). They investigated the influence on patient verbal behavior of various degrees of therapist specificity. By specificity, the authors meant the degree to which the therapist structured and guided the content development of the interview. Like Dibner (1958) and Bordin (1955) before them, they found as the interviewer asked more specific questions and more rigorously controlled the development of interview process, anxiety (measured by speech disturbance) and the subjects' verbal productivity declined. A low specific (or unstructured) interview process increased anxiety as well as verbal output.

Clemes and D'Andrea (1965) took issue, to a degree, with the above investigators. Their contention was that anxiety is generated among interviewees as a function of the divergence of their expectations from what, in fact, they were experiencing in the interview. The stress of having to cope with an unexpected and confusing format was, in their view, the source of anxiety symptoms.

It may well be that anxiety, with all of its behavioral correlates, verbal and other, is fundamentally a result of an individual's realization that his goals are difficult to define and even more difficult to attain (Bradford, Gibb and Benne, 1964). More harrowing may be the ultimate realization that the responsibility is his, and not the therapist's or the counselor's. The unstructured interview brings this realization home with greater impact.

Beyond these studies there are large areas to be investigated relative to the entire question of the relation of stress not only to therapeutic outcome but to the more elemental components of the dyadic

interaction. Murray (1971), in a broad review of literature relating anxiety and verbal productivity, found that a large number of studies have reported a significant negative relationship between verbal quantity and situational anxiety. This was true where test instructions, interviewer climate and (contrary to Kanfer's findings alluded to above) stressful topics were the media for generating anxiety. Generally speaking, where there have been only two stress conditions, verbal productivity has declined with high stress. Where three or more stress levels have been tested, the inverted-U relationship has frequently appeared. In short, mild and moderate stress seemed to increase verbal quantity and velocity but severe stress often operated to depress these measures.

The fallow field relating proxemic variables with the various kinds of stress factors which can interact with them has virtually not been looked at to date.

Conclusion

It is apparent that proxemics is a science whose most basic principles are still in formation. There are large areas yet to be dealt with seriously, as was indicated above. If therapists, for example, are interested in gathering the kinds of information that will enable them to structure a dyadic session so as to (a) facilitate the flow of information, (b) reduce the level of anxiety to manageable proportions, (c) foster an emotional climate which permits the rapid establishment of rapport between dyads, then numerous studies in this area are still necessary.

Little, if anything, is known of the influence of room size and interpersonal distance on verbal fluency and velocity. Little evidence, beyond the anecdotal, exists concerning the influence of room size and visual interaction. It was to fill these and other lacunae, to probe these and other questions, that this study was undertaken.

Hypotheses

The following null hypotheses emerged from the issues discussed above. They were tested in the experiment described below:

1. The total duration of the subjects' speech will not differ significantly as the result of the main or interactive effects of stress, experimenter, room size, and distance factors.
2. The total sum of words uttered by an interviewee during an entire session will not differ significantly as the result of the main or interactive effects of stress, experimenter, room size, and interpersonal distance.
3. The total duration of eye contact between dyads during an entire interview will not differ significantly as the result of the main and interactive effects of stress, experimenter, room size, and interpersonal distance.
4. The verbal velocity of the subjects will not differ significantly as the result of the main or interactive effects of stress, experimenter, room size, and interpersonal distance.

C H A P T E R I I I

METHODOLOGY

This chapter deals exclusively with the experimental component of this study. Further, it outlines those methodological, logistical and design elements which were necessary to implement it. It will treat successively: (a) the factors and the design of this study, (b) the selection of the subjects, (c) the method employed, and (d) the functions and training of the interviewers.

Factors and Design

Design

As explained in Chapter I, this study was principally designed to measure the effects of certain proxemic variables on selected interview behaviors. The most appropriate research design for this purpose was judged to be a mixed factorial analysis of variance. It is called a mixed design (Myers, 1966) because it is not completely factorial. As will be shortly explained, there were two within-subjects variables. That is, a repeated measures procedure was used, in which each subject participated in a similar way in all levels of two of the treatment variables.

Factors

Four experimental factors were used in the study: an interpersonal distance factor, a room size factor, a stress factor and an experimenter factor. The four factors were introduced on three levels into a

ROOM SIZE		S M A L L			M E D I U M			L A R G E			
		Close	Medium	Far	Close	Medium	Far	Close	Medium	Far	
Interpersonal Distance	Inter-viewer1	n = 4									
	Inter-viewer2										
	Inter-viewer3										
HIGH	Inter-viewer1										
	Inter-viewer2										
	Inter-viewer3										
STRESS	Inter-viewer1										
	Inter-viewer2										
	Inter-viewer3										
MEDIUM	Inter-viewer1										
	Inter-viewer2										
	Inter-viewer3										
STRESS	Inter-viewer1										
	Inter-viewer2										
	Inter-viewer3										
MINIMAL	Inter-viewer1										
	Inter-viewer2										
	Inter-viewer3										
STRESS	Inter-viewer1										
	Inter-viewer2										
	Inter-viewer3										

Fig. 1. Schema of factors in the analysis of variance of data which was collected in this study.

3 X 3 X 3 X 3 analysis of variance design (See Figure 1). The within factors consisted of the proxemic variables, to wit: (a) three different size rooms in which the interviews took place and (b) blocked within each of these three categories was an interpersonal distance factor, on three levels, which was the distance separating the interviewer from the subject. Of these two factors every subject experienced each level. The between factors consisted of two experimental but nonproxemic factors, to wit: (a) experimentally induced stress on three levels, and (b) three different interviewers, blocked within each stress condition. It may be helpful at this point to refer to Figure 1 and Table 1 for a graphic and a tabular representation of this factorial design.

The three interpersonal distance measures were 30 inches, 50 inches and 80 inches. The reasons for these distances were as practical as they were theoretical. Thirty inches corresponds to the midpoint of personal distance in E. T. Hall's analytic paradigm of microspace (1966, p. 119). It is clearly an inappropriately close distance for the ordinary interview in the United States. Practically, it is just about as close as two seated, facing persons can get without banging knees or otherwise being in physical contact with one another. However, it is personal distance and small enough to test the effects which physical proximity will have on the criterion measures that were selected. Eighty inches, which, in the same paradigm, is social distance-far phase seemed large enough to countervail the proxemic effects of the smallest distance. That is, this large interpersonal distance involves a different set of social and physiological parameters as was

TABLE 1

Summary Table of Analysis of Variance of Data Collected

Source	df
<u>Between Subjects</u>	<u>35</u>
Stress (S)	2
Interviewer (E)	2
S X E	4
Subjects within groups	27
<u>Within Subjects</u>	<u>288</u>
Room Size (R)	2
R X S	2
R X E	4
R X S X E	8
R X Subjects within groups	54 (72)
Distance (D)	2
D X S	2
D X E	4
D X S X E	8
D X Subjects within groups	54 (72)
D X R	4
D X R X S	8
D X R X E	8
D X R X S X E	16
D X R X Subjects within groups	108 (144)
Total	323

shown in Chapter II. Moreover, it was about as far as two seated persons were able to get from one another in the smallest experimental room. The third level of interpersonal distance used was fifty inches, a comfortable middling distance corresponding to social distance-close phase. This distance in the United States is appropriate for business or professional transactions but of a less formal or impersonal nature than in the far phase (Hall, 1966, p. 121). Distance was measured from the centers of the chairs which the interviewers and the subjects used. The chairs were placed approximately in the centers of the experimental rooms.

The three rooms which were used are windowless and have the same height ceilings. The largest room is rectangular in shape. Its floor dimensions are 20' x 14'. The two smaller rooms are both square. Their dimensions are 12' x 12' and 8' x 8'. These rooms are practically identical as regards their other characteristics, to wit, the color of the walls, the furnishings (which were little besides two chairs, a stand for the microphone, an ashtray and an area rug), lighting and temperature.

A third factor consisted of the interviewers (See Figure 1). Three skilled interviewers, colleagues of the author, participated in this study. They were all men and all in their twenties. No effort was made to match interviewers (for reasons that will be made clear below) on the basis of educational, personality or professional background. There was, however, no question of their competency to participate in the experiment.

The fourth and last factor was that of stress which was induced solely by an instructional instrument (See Appendix). The stress was induced on three levels and the subjects of the study were assigned to these three levels independently of their personality characteristics. The assignments, in short, were done on a random basis.

Criterion variables

The criterion variables in this research design, as distinguished from the independent variables just described, were the following four: (a) the total duration of utterance of each subject in every interview session (measured in seconds), (b) the total sum of the words spoken by each subject in every interview session, (c) the velocity of speech of the subject (measured in words per second), that is, the total sum of words divided by the total duration of utterance and, (d) total duration of eye contact (measured in seconds), that is, the length of time that the subject engaged the eye of the interviewer in each interview session.

Subjects

The subjects for this study were 36 White male undergraduates currently studying at the University of Massachusetts. They were randomly selected from a pool of 76 applicants who had been attracted to participate in experimental studies being conducted at the Counseling Center by an advertisement placed in the Daily Collegian. The notice stipulated that a payment of \$2.00 would be made to each participant.

There is, of course, a distinct selection factor at work here. This creates a limitation which is admittedly present not only in this study but in most behavioral studies using a university population as its selection base. However, the decision to pay the participants was partially motivated by the desire to remove at least some of the systematic bias that might be introduced if one simply asked for volunteers. For, the reasons why certain people volunteer for psychological experiments is shrouded in mystery; furthermore, they are highly suspect in terms of the representativeness of their interests and mental sets. So paying participants would seem to help in controlling these motivational factors which conceivably are highly correlated with peculiar behavioral biases (Campbell and Stanley, 1966, p. 19). It would seem to do this by attracting persons who are more "normally" motivated, since money is widely recognized to be a generalized reinforcer in the United States. A more detailed examination of the consequences of the selection factor in this study can be found in Chapter V.

Methods

This research design is a repeated measures design in which each of the 36 subjects were interviewed in every combination of room size and interpersonal distance. The subjects were randomly assigned to the three stress conditions, twelve in each. Then each subject within each stress condition was randomly assigned to one of the three interviewers (See Figure 1). Finally, in order to neutralize possible order effects, each subject was randomly assigned to a sequence of treatment conditions numbered one through nine, and drawn from a table of random numbers.

This meant that each interviewer interviewed four subjects in every combination of stress-room-size interpersonal distance. The randomization procedure scrambled these combinations so that experimental artifacts would not show up as the result of habituation, fatigue, hunger or some other maturational factor.

Set

The design called for experimentally induced stress on three levels: high, intermediate and minimal. In order to standardize this factor as much as possible it was decided to induce it solely by the use of printed instructions (See Appendix). Those subjects who had been assigned to the high stress group were informed that they were involved in a study of interview behavior and that it was believed that their intelligence could be assessed by that behavior. They were further informed that the experimenters judged that their comportment would be predictive of their ability to get a good job through a placement interview. Lastly they were told that a highly skilled interviewer would meet with and observe them. In formulating these instructions, the experimenter felt that evaluation, focused in the area of intelligence and occupational level, would generate more anxiety than in other feasible areas. Those in the minimal stress group were told that they would be interviewed by a student. No question of evaluation was introduced. Those in the intermediate group were informed that their level of social adaptiveness and poise would be measured by their interview behavior and that they would be interviewed by a skilled interviewer.

Content

As regards the content of the interview, the subjects were asked to speak freely on any subject they wished to whether it be personal, public, academic or political. It was suggested that they initially begin to discuss "student life on the UMass campus, the social, financial, academic problems facing today's student, pressures to conformity, quality of teaching, administration" and so forth. They were told, further, that the interviewer would not answer direct questions, as his principal role was that of an observer.

Apparatus

The apparatus consisted of (a) microphones and stereo tape recorders, (b) "Christmas tree" lights and necessary circuitry for cuing the interviewers, (c) switches, installed in the arms of the interviewers' chairs, and accompanying circuitry and (d) the control panels which contained the timing clocks and the switches necessary for regulating the operation of the individual interview sessions.

The control panels were built so that a technician could monitor and time the entire session. Installed in the panel were an electric clock, several toggle switches and an on-off switch. The panel was wired so that (a) when the main switch was thrown, the clock would begin to run, (b) when the sweep (second) hand made contact with a section of an independent circuit stretching from six o'clock to nine o'clock, a red light went on in the experimental room, (c) when a toggle switch was thrown, an orange light went on in the experimental room, and (d) when

an on-off switch was depressed, a green light flashed in the experimental room. The purpose of this apparatus was to provide the timing and the cuing necessary for the conduct of each session.

A two-channel (stereo) audiotape recorder was used to record, in each of the three experimental rooms: (a) the total verbal interchange in each session, and (b) a tone caused by the depression of a switch by the interviewer whenever the subject gazed at the interviewer's eyes. The microphone was placed at the subject's side during each session. As regards the tone switch, it was seated under the right arm of the interviewer's chair, in such a way that it was not visible to the subject. It also could easily be depressed by any finger of the interviewer's right hand without any perceptible telltale sign. Wires ran unobtrusively from the chair to the equipment room where, powered by a 9-volt transistor battery, they were connected to a code oscillator module and thence plugged into the recorder on the alternate channel. The module generated a 400 cycle tone which was simultaneously recorded with the input from the microphone.

Experimental procedure

The subjects appeared for the experiment, over a period of six weeks, in the late afternoon or evening. After they had read the instructions they were introduced to the interviewer and began the series of nine interviews, proceeding from one setting to the next, in a sequence determined by a randomization process. Each interview session lasted three minutes. The interviewers were in no way to influence the behavior of the subjects except to provide the social

milieu, in this case a dyadic interaction, in which the subjects could express themselves freely. The beginning and the end of the session was cued for the interviewer by an orange light which stayed lit for the three-minute duration of the session.

The interviewer's repertoire of interventions were limited to two, to wit: (a) mm-hmm, and (b) a simple bland paraphrase of the subject's utterances. A study by Kennedy and Zimmer (1968) showed that these counselor responses were powerful facilitators of positive and continued self-expression. The interviewers had been trained to emit their responses on cue. In an equipment room, a technician periodically turned on a green light for a period of two seconds at intervals determined by a random schedule. The red light, on a fixed schedule, was controlled by a timing clock. It was lit for the third quarter of every minute of the session. When the green light and red light were on simultaneously, the interviewer paraphrased. When the green light was on alone he uttered "mm-hmm".

The random schedule (for the green light) was contrived in the following fashion. A deck of blank cards was built and on each card was printed a number ranging from 12 to 25. These numbers represented the length (in seconds) of the intervals separating the green light cues. Prior to each session, the technician shuffled the deck. Using a stopwatch, he measured the intervals dictated by the successive cards in the deck. At the end of each interval he depressed the switch for the green light for approximately two seconds.

In order to record visual interaction, the interviewer was trained to depress a switch seated in the underarm of his chair for as long as

the subject engaged his eyes. As shown by certain studies (Hutt and Ounsted, 1966; Nash, 1969; Robson, 1967), eye contact is an arousal stimulus and it generates considerable tension in both dyads. The experimenters were originally scheduled to avert their eye gaze from the subjects on a fixed schedule. It was discovered in a pilot study that this often forced an artificial and inappropriate behavior on the interviewer. It was decided to allow him to avert his eyes for brief (two second) intervals at his discretion.

Prior to the experiment proper, a short pilot experiment, just alluded to, was conducted with five students drawn from the pool of applicants described above in the section on Subjects. As a result of that study a number of refinements were introduced into the methodology. The most significant modification was the reduction of each session's duration from five minutes, as originally proposed, to three minutes. It was the considered judgment of a number of counselors that the same information (given the goals of the study) was generated in nine three-minute sessions as in nine five-minute sessions, without the disadvantages of the fatigue, boredom, and maturational factors which seemed to accelerate rapidly after thirty to forty minutes in the experimental process.

Interviewers

Three skilled interviewers, colleagues of the author, participated in this study. Although one interviewer would have been able to manage all the interviews, it was feared that an experimental artifact might emerge from a subtle personality idiosyncrasy of that interviewer. This

danger was decreased by using three interviewers and randomly assigning them to four different subjects within each stress condition. This gained the added advantages of a randomized blocks design which permitted the error term to be reduced should there be significant differences between the criterion measures affected by the different interviewers.

Several weeks prior to the experiment the interviewers were briefed on the nature of the experiment: the design, the factors and the methodology. Further, the interviewers practiced the procedure of the experiment until they felt comfortable and efficient in their tasks. This practice was necessary as the interviewers had a number of things to be alert to during each session. When the orange light went on, they were instructed to say: "You may begin". Whenever the green light went on alone, they uttered, "mm-hmm"; when it flashed on and the red light also was on, they uttered a simple paraphrase of the most recent subject utterance, or if the subject was speaking at the time, at the end of that current utterance. While attending to the lights which were situated on a wall behind the subject's shoulder, as well as to what the subject was saying, the interviewer also had to be alert to the frequent and often brief eye contacts of the subject which he recorded by depressing a switch. Furthermore, he escorted the subject from setting to setting, seeing to it that the experimental conditions were in order before allowing the subject to enter the room.

Data and Analysis

All the data for this study were stored on the tape recordings of the interviews. The experimenter extracted these data from the tapes by (a) coding words from the tape onto paper so that they could be counted and totaled, (b) cumulatively summing by stop-watch the actual duration of the subjects' utterances, allowing into the computation approximately three seconds of silence at the end of each utterance, (c) cumulatively summing by stop-watch, the duration of the visual interactions as recorded in 400 cycle tones.

These data were then punched into computer cards. A program was written which transgenerated the "velocity of speech" data from the "total duration of utterance" and the "total sum of words" by dividing the latter by the former. The program called for punched output with the data described in (a), (b), and (c) above, together with the new data generated. This new data deck was introduced into a BMD08V program and run on the CDC 3600 computer which is housed and operated in the Research Computer Center at the University of Massachusetts.

C H A P T E R IV

RESULTS

A 3 X 3 X 3 X 3 factorial analysis of variance with repeated measures on the two proxemic variables (room size and interpersonal distance) was used for the analysis of the data generated in this study. The results of this analysis are presented in a series of tables and figures dealing successively with the following criterion measures: total duration of utterance, total sum of words, total duration of eye contact and verbal velocity. In these variance analyses, where significant differences in variances were found, a Newman-Keuls test of ordered means was performed. The sole exception to this latter procedure occurs in our analysis of the significantly different interactive effects found in criterion variable, verbal velocity. We resorted to graphing procedures in order to clarify the nature of these interactions.

Criterion Variable 1: Total Duration of Utterance

The null hypothesis relating to the variable, total duration of utterance, may be stated as follows: the total duration of the subjects' speech will not differ significantly as the result of the main or interactive effects of stress, experimenter, room size and distance factors. As an examination of Table 2 reveals, the null hypothesis may be rejected at a .95 confidence level for one main effect, that of distance.

TABLE 2
 Analysis of Variance of Subjects' Total Duration of Utterance

Source of variation	df	ss	ms	F
<u>Between subjects</u>				
Stress (S)	35	12,967.19	6,483.59	1.27
Experimenter (E)	2	8,192.07	4,096.04	.80
S X E	4	23,830.85	5,957.71	1.16
Subjects within SE	27	138,153.31	5,116.79	
<u>Within subjects</u>				
Room size (R)	288	826.13	413.06	1.16
S X R	4	1,174.57	293.64	.82
E X R	4	227.63	56.91	.16
S X E X R	8	821.44	102.68	.29
R X subjects within SE	54 (72)	19,257.78	356.63	
<u>Distance (D)</u>				
S X D	2	2,682.07	1,341.04	3.65*
E X D	4	622.85	155.71	.42
S X E X D	4	1,251.35	312.84	.85
D X subjects within SE	8	5,610.67	701.33	1.91
	54 (72)	19,849.94	367.59	
<u>Interaction</u>				
R X D	4	192.96	48.24	.11
S X R X D	8	1,467.61	183.45	.43
E X R X D	8	2,739.50	342.44	.79
S X E X R X D	16	4,100.48	256.28	.59
R X D X subjects within SE	108 (144)	46,549.22	431.01	

*p < .05

The Newman-Keuls test was used to determine where the significant difference(s) lay. The results of this test are presented in Table 3.

TABLE 3
Newman-Keuls Test on Ordered Means of Total
Duration of Utterance at Various Levels of Distance

	<u>Close</u>	<u>Far</u>	<u>Medium</u>
Ordered Means	144.84	149.81	151.66
	Close	Far	Medium
Close	-----	4.97	6.82*
Far			1.85
Medium			

* $p < .05$

Table 3 indicates that the total duration of utterance differed significantly between the close (30 inches) and the medium (50 inches) distances. A significant difference at an acceptable confidence level was not present between either the close and far distances or the medium and far distances. As indicated in this table, the subjects spoke, on an average, for 144.84 seconds out of every three minutes when they were at a close distance to the interviewer, but for 151.66 seconds out of every three minutes when they were at the medium distance. It is clear, then, that the greatest fluency of speech occurred when the subjects were seated at the moderate distance rather

TABLE 4

Analysis of Variance of Subjects' Total Sum of Words

Source of variation	df	ss	ms	F
<u>Between subjects</u>	<u>35</u>			
Stress (S)	2	60,138.38	30,069.19	.55
Experimenter (E)	2	31,635.14	15,817.57	.29
S X E	4	342,261.79	85,565.45	1.55
Subjects within SE	27	1,487,147.17	55,079.52	
<u>Within subjects</u>	<u>288</u>			
Room size (R)	2	13,760.91	6,880.46	2.16
S X R	4	12,685.57	3,171.39	1.00
E X R	4	6,645.53	1,661.38	.52
S X E X R	8	6,588.04	823.51	.26
R X subjects within SE	54 (72)			
Distance (D)	2	38,382.27	19,191.13	7.10*
S X D	4	5,948.55	1,487.14	.55
E X D	4	25,854.84	6,463.71	2.39
S X E X D	8	32,682.23	4,085.28	1.51
D X subjects within SE	54 (72)	145,987.67	2,703.48	
R X D	4	7,893.18	1,973.29	.52
S X R X D	8	25,605.84	3,200.73	.85
E X R X D	8	36,505.65	4,563.21	1.21
S X E X R X D	16	26,463.44	1,653.96	.44
R X D X subjects within SE	108 (144)	408,176.33	3,779.41	

*p < .05

than at the extremes. However, it appears that the far distance depresses fluency less than does the close.

Criterion Variable 2: Total Sum of Words

The null hypothesis relating to the variable, total sum of words states that: the total sum of words uttered by an interviewee during an entire session will not differ significantly as the result of the main or interactive effects of stress, experimenter, room size and interpersonal distance.

The inspection of Table 4, the summary table of the analysis of variance, reveals that the null hypothesis may be rejected at .05 significance level for the main effect of distance. The Newman-Keuls test as evidenced in Table 5 indicates that the criterion measure, total sum of words differed significantly between the close and the

TABLE 5

Newman-Keuls Test on Ordered Means of Total Sum
of Words at Various Levels of Distance

	<u>Close</u>	<u>Medium</u>	<u>Far</u>
Ordered Means	335.82	358.22	359.55
	Close	Medium	Far
Close	-----	22.40**	23.73**
Medium			1.33
Far			

**p < .01

TABLE 6

Analysis of Variance of Subjects' Total Duration of Eye Contact

Source of variation	df	ss	ms	F
<u>Between subjects</u>				
Stress (S)	<u>35</u>			
Experimenter (E)	2	12,828.72	6,414.36	1.43
S X E	4	19,941.56	9,970.78	2.22
Subjects within SE	27	33,273.61	8,318.40	1.86
		121,016.22	4,482.08	
<u>Within subjects</u>				
Room size (R)	<u>288</u>			
S X R	2	7,797.35	3,898.68	10.79***
E X R	4	736.59	184.14	.51
S X E X R	4	2,584.93	646.23	1.78
R X subjects within SE	8	4,549.57	568.70	1.57
	54 (72)	19,519.11	361.47	
<u>Distance (D)</u>				
S X D	2	4,521.91	2,260.95	7.76***
E X D	4	412.37	103.09	.35
S X E X D	4	1,693.37	423.34	1.46
D X subjects within SE	8	2,233.63	279.20	.96
	54 (72)	15,701.61	290.77	
R X D	4	277.74	69.44	.33
S X R X D	8	1,663.31	207.91	1.04
E X R X D	8	2,092.81	261.60	1.31
S X E X R X D	16	3,990.02	249.38	1.23
R X D X subjects within SE	108 (144)	21,608.56	200.08	

***p < .01

medium distances at a level of .01 and also between the close and the far distances at a level of .01. The null hypothesis can therefore be rejected at the .99 confidence level. No significant differences were found in this variable between the medium and the far distance.

From the ordered means in Table 5 we can see that in terms of total volume of words less was said at the close distance than at the medium distance or the far distance. At the close distance, the interviewees spoke, on the average, 335.82 words over a three minute period; in the medium distance they spoke 358.22 words in each three minute period. This evidence indicates that at interpersonal distances of 50 inches and 80 inches the quantity of words uttered is about the same. At the close distance, 30 inches, however, this index is depressed.

Criterion Variable 3: Total Duration of Eye Contact

The null hypothesis relating to variable 3 states that: the total duration of eye contact between dyads during an entire interview will not differ significantly as the result of the main or interactive effects of stress, experimenter, room size and interpersonal distance.

The results of an analysis of variance of total duration of eye contact are presented in Table 6. An examination of the table indicates that there were significant differences in eye contact as a function of the main effect of room size. The same was also true of the main effect of interpersonal distance. The null hypothesis was rejected at the .99 confidence level for independent variables room size and interpersonal distance.

The Newman-Keuls test for locating points of significance was

conducted on this data for both room size and distance. The results of this test for the effect of various levels of room size are presented in Table 7. This table indicates that the significant differences lay between the large and small rooms and the large and medium rooms, both at the .01 level of significance.

TABLE 7
Newman-Keuls Test on Ordered Means of Total Duration
of Eye Contact at Various Levels of Room Size

	<u>Large</u>	<u>Small</u>	<u>Medium</u>
Ordered Means	38.23	48.47	48.80
	Large	Small	Medium
Large	-----	10.24**	10.57**
Small			.33
Medium			

** p < .01

On the average, subjects engaged the eyes of their interviewers 38.23 seconds per session when in the large room, 48.47 seconds per session in the small room and 48.80 seconds per session in the medium room. So the evidence is that there was significantly more visual interaction in the medium and small rooms than in the large room. The difference between the amounts of visual interaction in the small and medium size rooms is negligible as is evident from an inspection of the ordered means.

The result of the Newman-Keuls test on the effect of the various levels of the distance factor are presented in Table 8. Table 8 reveals

TABLE 8
Newman-Keuls Test on Ordered Means of Total Duration
of Eye Contact at Various Levels of Distance

	<u>Close</u>	<u>Medium</u>	<u>Far</u>
Ordered Means	40.53	45.30	49.68
	Close	Medium	Far
Close	-----	4.77*	9.15**
Medium			4.38
Far			

*p < .05

**p < .01

that the significant differences in total duration of eye contact lay between the close and medium distances at the .05 level and between the close and far distances at the .01 level. Although it approached significance at the .05 level, the difference in eye contact at the medium and far distances was not actually significant.

On the average, subjects engaged the eyes of their interviewers for 40.53 seconds (in each 180 seconds of interview time) at a close distance, for 45.30 seconds (likewise in each three minute session) at the medium distance, and for 49.68 seconds (in each three minute session) at the far distance. There was significantly more visual

interaction in the far and medium interpersonal distances than in the close. Although subjects gazed at their interviewers considerably more at a far distance than at the medium distance, it was not sufficiently more to reach significance at an .05 level.

Criterion Variable 4: Verbal Velocity

The null hypothesis relating to the variable, verbal velocity, may be stated as follows: the verbal velocity (that is, total sum of words divided by total duration of utterance) of the subjects will not differ significantly as the result of the main or interactive effects of the stress, experimenter, room size and distance factors. The analysis of variance (See Table 9) revealed that significant differences were present. However, these differences were in the interactive effects of (a) experimenter and distance, and (b) stress, experimenter and distance. The null hypothesis with regard to these effects was rejected at a .95 level of confidence.

Figure 2 graphically presents the differences between the various interpersonal distances for each of the three interviewers who collaborated in the study with regard to verbal velocity. Of particular note are the means of the number of words per second emitted by those subjects who were interviewed by E₁ and E₃ at the close distance. For the former it was 2.39; for the latter it was 2.23. The relative positions of these two interviewers is reversed at the far distance. For E₃ the mean number of words of the subjects is 2.44, for E₁ it is 2.33. The graph suggests that the differences that showed up at the medium distance (50 inches) are minimal. The wide differences between interviewer effects occur at the extreme distances.

TABLE 9

Analysis of Variance of Subjects' Velocity of Speech

Source of variation	df	ss	ms	F
<u>Between subjects</u>	<u>35</u>			
Stress (S)	2	.30	.15	.16
Experimenter (E)	2	.04	.02	.02
S X E	4	2.83	.71	.78
Subjects within SE	27	24.69	.91	
<u>Within subjects</u>	<u>288</u>			
<u>Room size (R)</u>	<u>2</u>	.14	.07	.88
S X R	4	.21	.05	.63
E X R	4	.19	.05	.63
S X E X R	8	.09	.01	.13
R X subjects within SE	54 (72)	4.18	.08	
<u>Distance (D)</u>	<u>2</u>	.32	.16	2.67
S X D	4	.40	.10	1.67
E X D	4	.66	.17	2.83*
S X E X D	8	1.32	.16	2.67*
D X subjects within SE	54 (72)	3.16	.06	
R X D	4	.19	.05	.71
S X R X D	8	.41	.05	.71
E X R X D	8	.29	.04	.57
S X E X R X D	16	.88	.06	.86
R X D X subjects within SE	108 (144)	7.05	.07	

*p < .05

Comparable interactive effects are found when one isolates the effects of the different stress conditions for each interviewer at each distance. These effects are graphed in Figures 3, 4, and 5. All of these data will be looked at more closely in the following chapter.

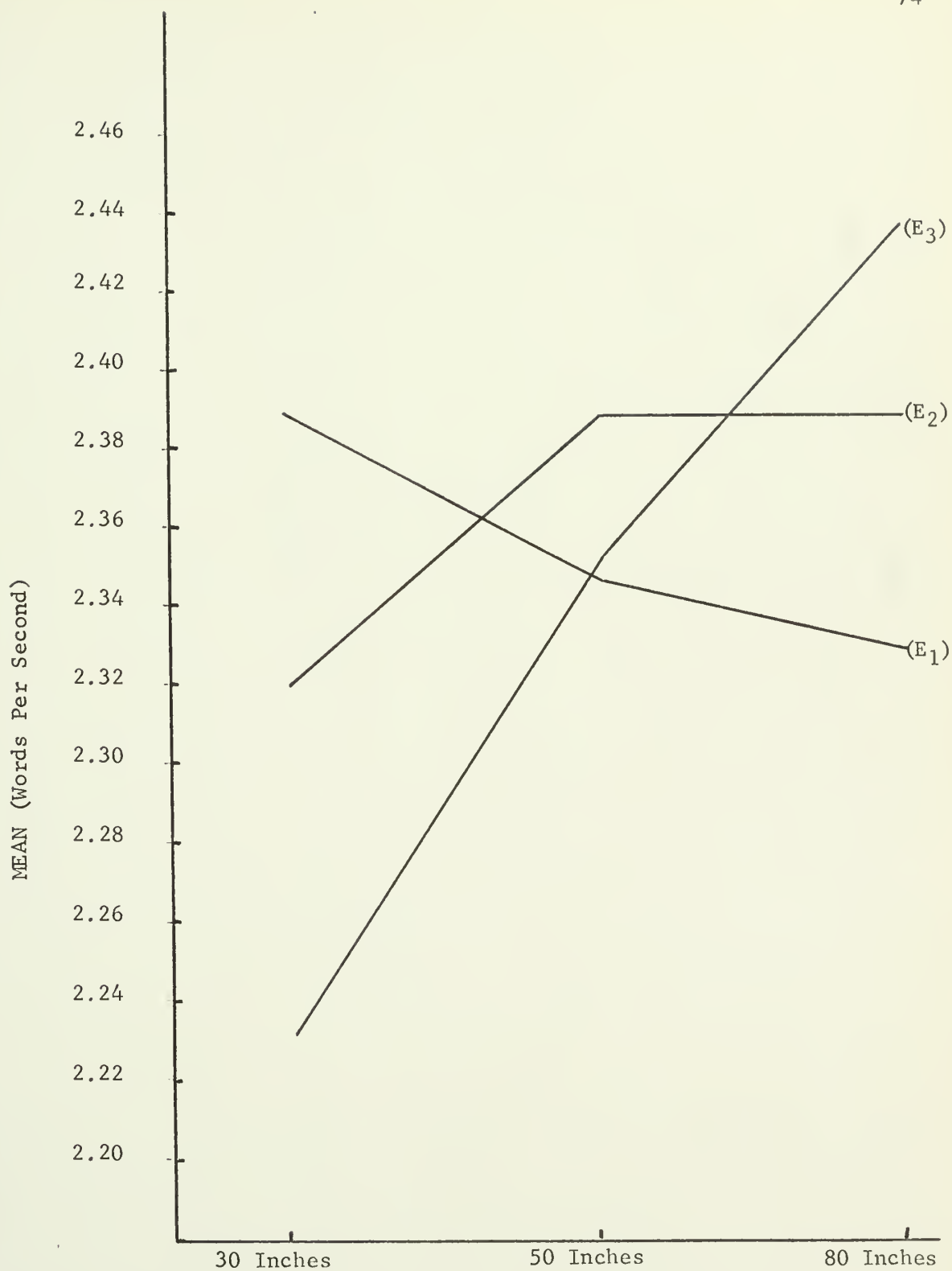


Fig. 2. Mean scores of verbal velocity at various distances and with several experimenters.

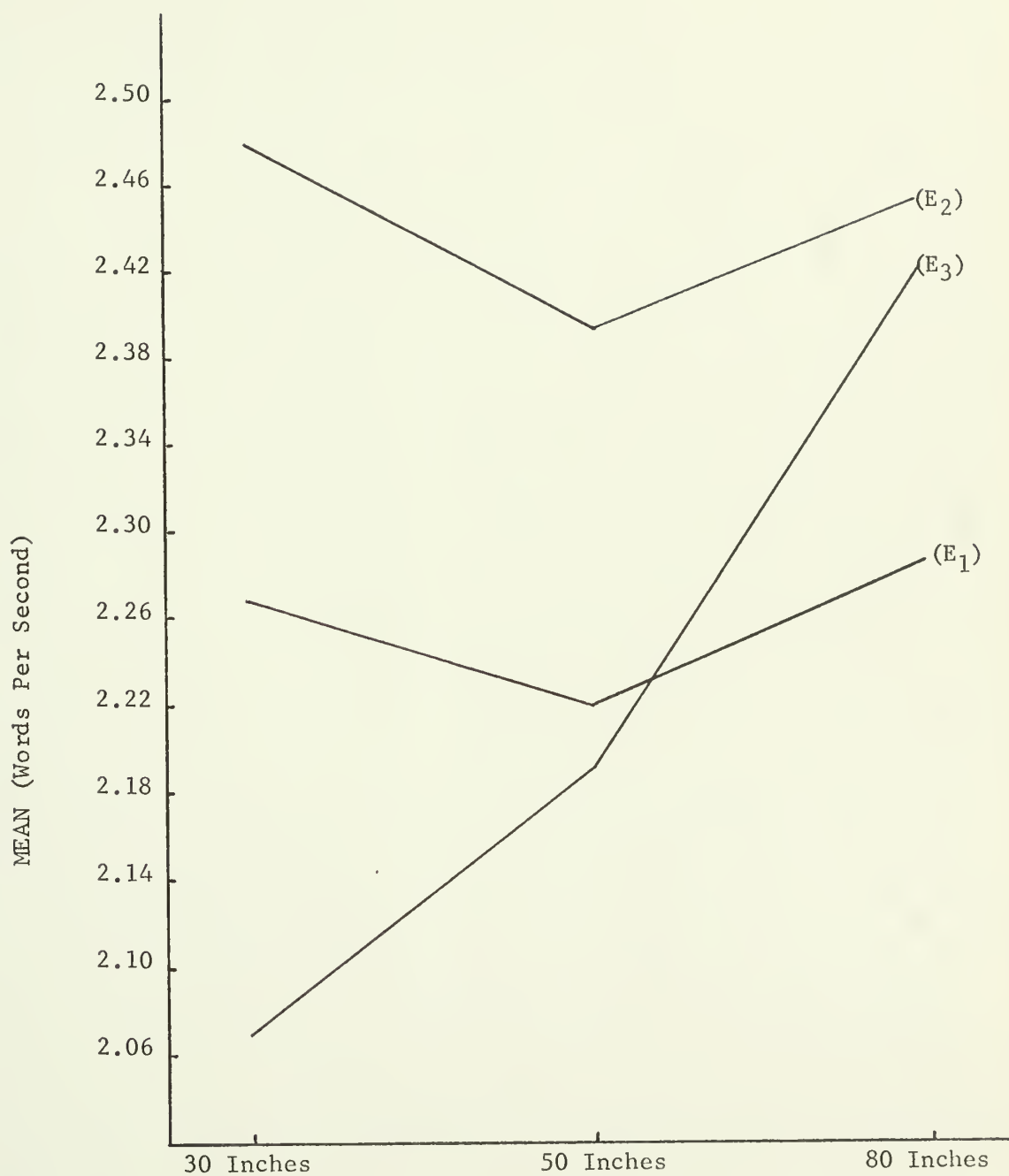


Fig. 3. Mean scores of verbal velocity under high stress with various distances and experimenters.

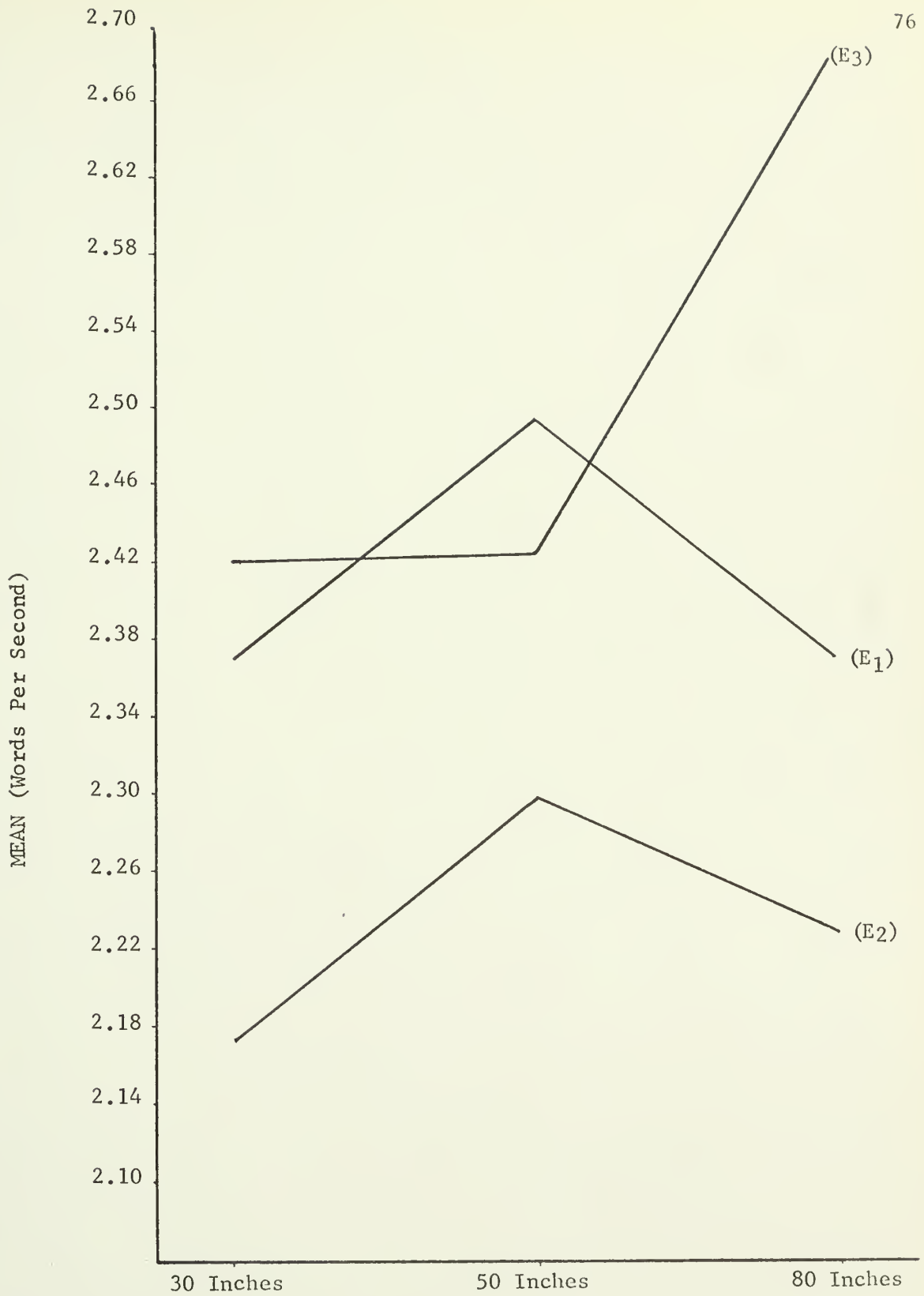


Fig. 4. Mean scores of verbal velocity under medium stress with various distances and experimenters.

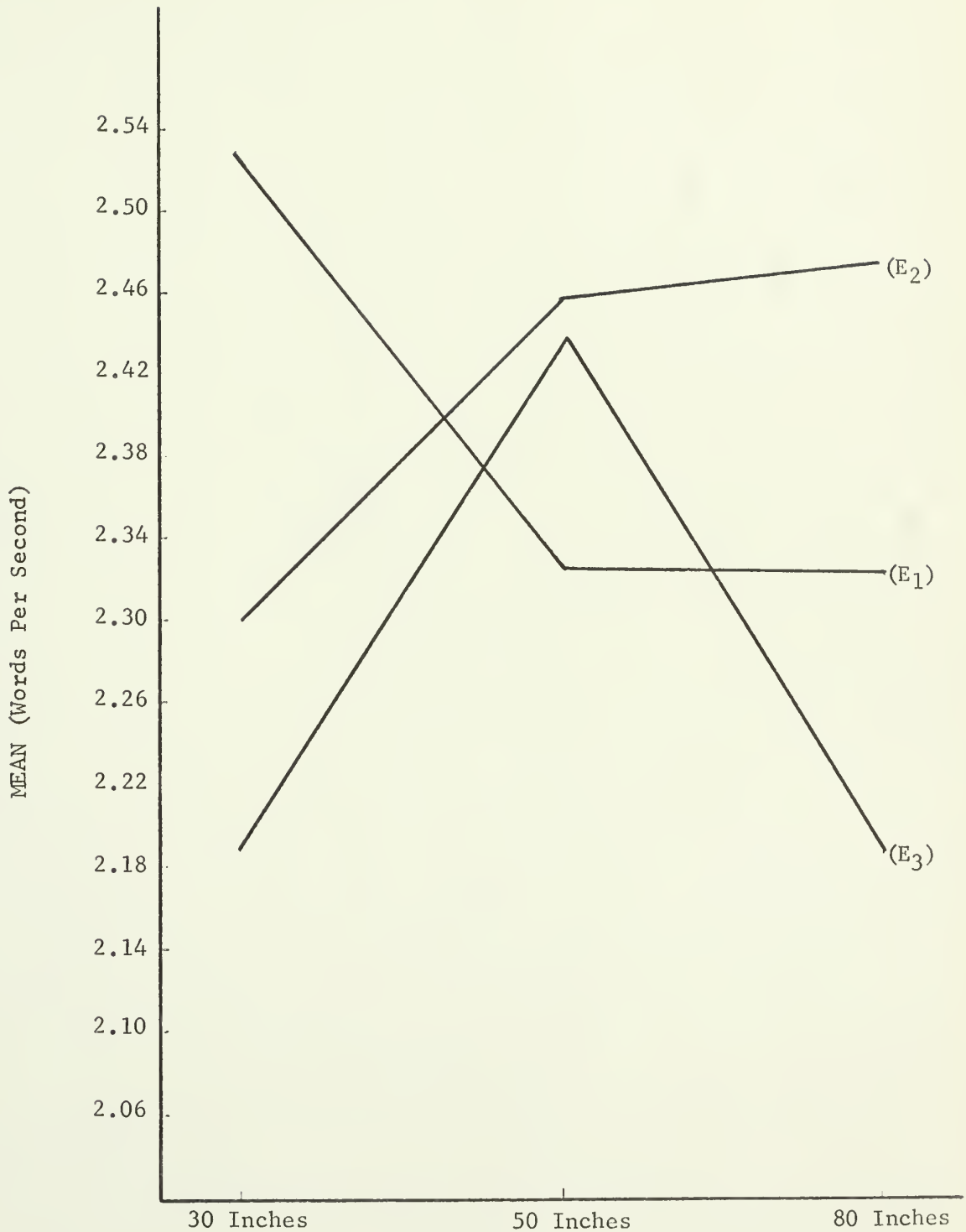


Fig. 5. Mean scores of verbal velocity under low stress with various distances and experimenters.

C H A P T E R V

DISCUSSION

In this chapter there will be an examination in greater detail of the results of the experimental study described in the preceding chapter. The primary concern of the study was to investigate the influence of the spatial environment on the paralinguistic and visual behavior of interviewees in an analog interview situation. This chapter will discuss the extent to which this was achieved by examining (a) the criterion variables, one by one, (b) the value and implications of the study, (c) the limitations of the study, (d) suggestions for further study, and, (e) some final conclusions.

Criterion Variables

Total duration of utterance

The present study clearly indicates that the percentage of interview time that an interviewee will spend in talking is at least partially a function of the distance which separates him from the interviewers. The null hypothesis which stated that the total duration of utterance is unaffected by interpersonal distance was rejected. It was speculated that when persons are brought into inappropriate closeness to one another that they become tense and anxious, for ethological studies suggested that this condition is stressful. It was thought that this would have an inevitable effect on an individual's speech behavior. As was stated in Chapter I, each person carries about a spatial buffer

zone which insulates him from unwanted contacts with his social environment. Hall (1966) conceived this space as an extension of the self beyond the boundaries of the body. When that space is invaded by another person, measures are taken to counteract its psychological impact and to mitigate the tension. It was hypothesized that among the measures an interviewee might take, whether self-consciously or not, to reduce tension was the device of speaking faster and at greater length. A basis for this hypothesis was found, for example, in Kanfer's studies (1959, 1960) which indicated that rate of speech increased with increased anxiety levels and Manaugh, Weins, and Matarazzo study (1970) that reported that motivational (and consequent emotional) sets influenced duration of utterances and reaction time latencies.

The opposite of this expectation was found to be true. The total length of time that subjects spoke when they were seated only thirty inches from their interviewer was significantly less than when seated fifty inches from him. Unexpectedly, subjects also spoke longer at the far distance than at the close distance, but not sufficiently longer to reach significance. However, it was at the moderate distance that the subjects proved most fluent.

Talking to another person is one way of approaching him, i.e., of reducing psychological distance. Stopping talking or even reducing the amount of time spent talking to another is the correlative way of psychologically distancing oneself from the other. What, colloquially, is called giving someone "the cold shoulder" is not just altering one's body orientation vis-a-vis another but includes the notion of silence.

Silence, when speech is invited, can either be a simple indication of withdrawal (as, for example, when the host wishes to indicate to his guests who have stayed long beyond midnight that he wishes to withdraw to his bedroom - alone); or it can be a sign of alienation and displeasure. Indeed, it can even have a punitive character to it.

It seems logical to conclude that when subjects wished to reduce the tension and anxiety that was generated in the close distance condition, they did it by withdrawing from the situation insofar as they felt they were able. One of the ways, as we shall see later, was by drastically reducing eye contact with the interviewer. The other way was by reducing verbal behavior. It is of interest to note here that there were other ploys used by the subjects which were not subjected to experimental scrutiny. These, for example, were such behaviors as badgering the interviewer, attempting to move the chair back, physically leaving the seat, or, in one case, quitting the experiment entirely.

These findings are congruent with Argyle and Dean's thesis (1965) that individuals are constantly in movement towards homeostasis. And as one proxemic variable or another is altered by someone else, one is left with the options of compensating for this by other means. For example, if a person approaches someone too closely then the other person will attempt to balance the proxemic equation by reducing eye contact, by turning aside or by sitting down.

Neither the stress nor the experimenter nor the room size factors significantly affected total duration of utterance. This is particularly surprising in the case of stress. If the induction of stress was successful (and this is open to question), it would seem that there should have been

some consequences of it in verbal behavior. The cell mean for medium stress was 140.2 (words per session); for high stress it was 150.8; for minimum stress it was 155.3. As is apparent, the mean differences were considerably greater for stress than for distance and yet the latter differences were significant. The reason for this is the high within-subjects variability for the stress factor.

It is quite possible that the stress induced by the written instrument (Appendix) was overridden by personological variables which were not distributed normally among the subjects. The anxiety level of each subject was a particularly erratic and fluctuating one and in retrospect it appears that it would have been methodologically advantageous to have controlled this variable in the research design by blocking rather than by randomization.

Total sum of words

Logically, this variable, total sum of words, is closely related to total duration of utterance. On the surface of it, we can say that the longer a person talks the more words he will probably utter. However, another variable can significantly alter this relationship and that variable is verbal velocity. But, as a matter of fact, verbal velocity did not significantly change, at least in regard to the main effects of the experimental variables. Consequently, sum of words uttered and duration of utterance changed in the same direction.

The null hypothesis that stated that total sum of words uttered in the experimental interviews would not differ significantly at the various interaction distances was rejected at the .95 confidence level.

In the Newman-Keuls test (Table 5) it was found that the means of the criterion variable differed significantly between the close and the medium distances and also (unlike the results of criterion variable 1) between the close and far distances. There was no significant difference between the medium and the far distances. For this criterion variable, as for the first, there were no main effects of room size, experimenter or stress nor any possible interactive effects which reached significance. We may generally draw the same conclusions about this variable, sum of words, as we did about the variable, duration of utterance, to wit, that an inappropriately close interaction distance (such as thirty inches) depresses verbal behavior.

Total duration of eye contact

As it was explained in Chapter II, eye contact serves a number of functions, from signaling the intent to communicate to specifying the affiliative and emotional character of the interaction. The person who is skilled in picking up and interpreting visual cues can distinguish fine calibrations of mood and affect in others. It was not unexpected, then, in this study that visual interaction among dyads would be the most sensitive criterion variable tested. It proved to be sensitive to the influence of two main effects: (a) room size at a .01 significance level, and (b) interpersonal distance at the .01 significance level.

Room size affected the amount of eye contact in an inverse direction to that expected. The duration of eye contact in the large room was significantly less than in either the small or medium rooms (See Table 7).

Indeed, the mean durations of eye contact for the small and medium rooms were practically the same, to wit, 48.47 seconds for the small and 48.80 seconds for the medium.

The expectation of less eye contact in a highly constraining spatial environment was based on the assumption that subjects would be more stressed and tense in the small room than in the large and that, consequently, they would be less inclined to confront an interviewer visually. The basis for this expectation is the research of Little (1965) and Sommer (1962) which indicated that the more confining the space in which persons interacted, the more they distanced themselves from one another, given the freedom to do so. This gave rise to the suspicion that not only physical distantiation but other density-regulatory mechanisms would operate to draw people together in a large space and spread them apart in a small space. It seemed that one of these mechanisms, eye contact, would operate in the large room to reduce psychological distance. As indicated above, this did not happen.

The conclusion which one is forced to come to is that a large room, or a street corner or open field for that matter, may function sociopetally (that is, in a socially integrative and cohesive way) relative to such proxemic behavior as reducing interpersonal distance or, on the other hand, sociofugally (that is, in a socially non-integrative, dispersive way) relative to such behavior as reducing eye contact. The reasons for this are obscure. One may conjecture that the entire experiment plunged the subjects into an ambiguous and highly stressful situation (Dibner, 1958) and that in the large room they were no more disposed to approach the interviewer than in the small room.

But the question arises, why make less eye contact in the large room than in the small? The answer may be that if three various size rooms are equally sociofugal, in terms of furniture, traffic patterns, lighting and so forth (Osmond, 1957; Sommer, 1967, 1969), then the largest room will exercise this influence more strongly than the smaller ones, particularly when the dyads have little personal investment in approaching each other. And by extrapolation, one may suppose that if two persons were seated in the middle of a meadow, eye contact would be still less, given the same conditions of stress, subject matter, relationship, personal distance, and so forth.

The main effect of interpersonal distance on eye contact was exactly as one might have expected (Argyle and Dean, 1965; Goldberg, et.al., 1969). As the dyads drew further apart they made increasing eye contact. Given stability in the other parameters of the dyadic interview as well as the psychological distance the subject wished to maintain between himself and the interviewer, eye contact was used to shrink (or extend) the distance between them.

Verbal velocity

This study indicated that verbal velocity, i.e., the rate at which people speak, was not differentially affected by the experimental variables that were used. This was truly surprising for, as it was demonstrated in Chapter II, anxiety and verbal velocity are interrelated (Murray, 1971). Furthermore, it is clear that emotion, embarrassment, anxiety, flight, aggression and so forth result from situations in which population density or personal proximity is excessive.

There was, however, an interactive effect between distance and experimenter. Evidently, the personality of the interviewer elicited significantly different rates of speech from the subjects at different distances. As Figure 1 graphically illustrates, Experimenters 1 and 3 had contrary effects at the close and far distances. The experimenter who was most laconic in his interventions (E_3) elicited the lowest rate of speech at the close distance. The experimenter who was most loquacious and animated (E_1) elicited the highest rate. The reasons for this are not clear. A functional analysis of the interviewer behavior and its interaction with interviewee behavior was not provided for by the experimental design. On the surface, however, it would seem that the interviewer who was most terse, serious and least sociable would depress verbal velocity the most in the most stressful situation, to wit, the closest distance in the smallest room. In that situation the means (words per second) for E_1 , E_2 , and E_3 were 2.42, 2.32, and 2.20 respectively. At the far distance the rank orders were dramatically reversed for the first and third experimenters. The reasons for this are too obscure to warrant comment.

There was a second order interaction between experimenter, distance, and stress which yielded a significant F. As is evident from Figures 3, 4, and 5, E_2 elicited relatively stable levels of verbal velocity. The significantly different interactive effects seemed to emerge from the power of E_3 to elicit highly different verbal rates from his interviewees at different stress and distance levels. However, he did this in directions opposite to those of E_1 and E_2 . As it was pointed out above (Goldman-Eisler, 1952) individuals bring idiosyncratic personological profiles to an interview which are powerfully evocative of differentiated responses from counselees (and, perhaps to a lesser extent, from counselors).

An examination of Figures 3, 4, and 5 suggests that at the medium distance there is the least dispersion of mean interviewee verbal rates. Interviewer effects, it appears, are mitigated by moderate (fifty inches) interpersonal distancing across the three levels of stress. The only other combination of distance and stress that rivals this one in terms of interviewer effects is that of high stress and far (eighty inches) distance (See Figure 3). The most plausible explanation for this would seem to be that the more comfortable distances allowed total stress to be reduced to more manageable proportions. Consequently, there would be less interaction between the stress and interviewer factors.

In this study it appears that verbal rate and verbal quantity were depressed in those settings which are assumed to generate greater anxiety. This finding is inconsistent with a number of others reported in Chapter 2. The reason for this may lie in the degree of stress induced in the experimental situation. Indeed, Murray (1971) has shown that where several levels of stress were experimentally induced, an inverted-U relation frequently appeared between stress and verbal productivity. As stress increased from minimal to mild to moderate so also did verbal productivity measures. However, as stress became relatively high, these verbal measures began to decline. In other words, as stress becomes increasingly severe it begins to inhibit and incapacitate an individual in his personal interactions. In an extreme case, where a person is terror-stricken, one could speculate that he might be totally immobilized. It seems that an abundance of anecdotal evidence exists pointing to this conclusion.

Implications

The verbal factor

If one is interested in the question of how to structure an interview so that its purposes are achieved, it is necessary to look at the proxemic dimensions of the interview setting. This study speaks to that question. It found that fluency is lessened by inappropriately close interpersonal distances. Past research has shown that anxiety not only disturbs speech but accelerates it. This seems inconsistent with the finding of this study, if we accept the assumption that crowding is stressful and inappropriate closeness raises anxiety. For here it was found that various interpersonal distances do not (except in their interactions with individual interviewers) significantly influence verbal velocity. However, the closest distance depressed the other verbal measures, to wit, duration of utterance and volume of words uttered.

As the findings of this study seem to indicate, it would seem advisable to take precautions against excessive interpersonal proximity in most dyadic situations. This would be particularly true of interviews with persons seeking counseling or psychiatric help. Most such persons have more or less severe interpersonal deficits such that normal contact with others, especially strange others, causes incapacitating anxiety and communicative breakdown. In view of that, it would seem reasonable to overdistance rather than underdistance oneself from clients, at least initially. There would then be less danger of damming the facile flow of information and the development of rapport so necessary to the therapeutic encounter. The therapist could thereafter reduce distance as he saw fit.

But even in a simple hygiologic perspective it would seem best to overdistance oneself with strangers and then move tentatively to a closer and more comfortable distance rather than do the opposite. It seems preferable to position oneself vis-a-vis another such that one is invited to come closer (this actually is done by a feedback system of interrelated cues according to Argyle and Kendon, 1967) rather than withdrawn from because of initial discomfort. In normal boy-girl relationships the mores of our society, at least traditionally, postulated a number of distinct approach phases before the boy attempted to become intimate. A courting style of college men of recent vintage requires, to the contrary, that the male attempt almost immediately to plunge into an intimate relationship with his date. If she is resistant they then move through a number of distinct avoidance phases to a comfortable distance. It is yet to be demonstrated that this is a more effective pattern than the traditional or that it invalidates the tentative hypothesis articulated above, to wit, it is generally preferable in any social context, professional, business, recreational or clinical, to overdistance oneself initially and move toward optimal approach levels. This would seem to be advisable, given the accuracy of the findings of this study, if only to ensure an optimal flow of verbal information.

The visual factor

Boundaries, if perceived, either visually or kinesthetically, turn persons back upon themselves. Other things remaining equal, it seems that receding boundaries or an enlarging space would induce persons to move apart, to disperse, to lose cohesiveness. In other words, sociofugality

would seem to be a function of increasing space. Conversely, sociopetality would be a function of decreasing space. This is suggested by the findings of this study, at least in regard to the proxemic event of visual interaction. The large room with its more distant walls resulted in a significant reduction in eye contact. The implications of this, which it may be useful to explore in the following paragraphs, are that if we want a sociopetal setting we should reduce its size; if we want a sociofugal setting we should increase its size.

For example, the kindergarten at the Marks Meadow Experimental School in Amherst, Massachusetts, is exceptionally large and complexly structured so that the child's eye can wander over a large array of miniature furniture, toys, counters, building materials, work areas and so forth from most points in the room. Rarely do the teachers attempt to make all the children do the same thing at once. When they do, unless it is for a brief period, it is difficult. If, on the other hand, one should want a classroom of children to focus on a central activity for long periods of time, it would be wise to reduce the size of the room, the visual perspectives, the scope for diverse, unrelated activities, in other words, the possibilities for freedom of action. In short, the room should be proxemically more sociopetal.

Another aspect of the visual issue is the question of lighting. If one reduces the lighting in a setting, it would seem that the effect is similar to reducing visual perspectives or to reducing the size of a room. Dim lighting reduces the scope for visual and consequently physical activity. When showing a film in a blacked-out room, one is ensuring that everyone is focusing on the screen. Normal people do not

long peer into the dark unless they expect to see something of interest. The same is true of restaurants, night clubs and so forth. If they are brightly lighted, the clientele do not stay as long (Sommer, 1969). The dimmer the lighting, the longer the clientele tend to stay. The tendency is for people in this case to focus their attention not only within the room but on their own table. Darkness fosters intimacy. It is sociopetal.

Increasing lighting is like pushing back the walls; and pushing back the walls gives greater scope for visual exploration and distraction. The writer's personal experience is that classes conducted outdoors were unsatisfactory in terms of doing "class work". It was difficult to concentrate even when nothing of interest was happening outside the context of the class. This may be no less true of counseling out of doors or in a large public place, even when privacy is ensured.

The logical conclusion to this would be that the more important that sociopetal conditions are to one's goals, the smaller, within limits, should be the space in which one is functioning. The limits to this are determined by the density factor and one's tolerance for it. Conversely, the more important that sociofugal conditions are for achieving one's goals, the larger should be the space and the more intense the lighting; the limits to this are dictated by the nature of the task and one's psychological tolerance for isolation.

For any group of persons engaged in a task there will be psychological vectors propelling them "out", reducing the tension and stress that results from feelings of being more or less crowded. And there will be countervailing vectors propelling them "in" and increasing the

sense of focus, interdependency and mutuality. The optimum proxemic level of interaction will be that which, given certain parameters, keeps tension and "focus" in some sort of balance.

One of the spatial parameters which will determine where that balance will take place is the size of the room. This study indicated that of the three rooms tested, it was the medium size room (12' x 12') that proved most conducive to high level interpersonal functioning in terms of visual interaction (and also verbal velocity and duration of utterance although neither of these criterion measures reached statistical significance).

On the other hand one may want to design a setting for a task which does not require a high level of interpersonal functioning. Thus, if the task is of a technical or objective nature which requires that the participants focus not so much on each other as on, say, an objective other such as a sandbox, or jigsaw puzzle or research project, then it might be best to reduce centripetal conditions that are interpersonal arousal stimuli. In this case, it would be best to enlarge the room and/or allow wide vistas for the eye to explore and the mind to fantasize in.

Limitations of this Study

1. The argument for unobtrusive measures has been well made by Webb, Campbell, Schwartz and Sechrest (1966). This study was experimental in nature and necessarily obtrusive in its measurements. Each subject was asked following the experimental session which behavioral variables he thought were being measured. Not one subject indicated

the correct ones. However, the experimental situation as a whole was obtrusive. The subjects realized that they were participating in an experiment, that their presence was necessary to generate data for analysis, that the format of the laboratory process was highly unlikely and, indeed, contrived (consider only the element of nine consecutive three-minute interviews), and that their entire performance was being monitored and recorded. One cannot help but believe that these had consequences beyond those which would have emerged had the subjects not self-consciously participated in this study. Since the object of this experiment was not to understand experimental behavior but nonexperimental behavior, these consequences were undesired. However, it is believed that the research was designed and executed with sufficient rigor that all subjects had the opportunity to experience the obtrusiveness in the same degree.

2. After considerable reflection on the matter, it does not appear that the variable of stress had enough salience to produce even a low profile result. The principal reason would seem to be that stress is an inherent element of an "interview experiment", particularly one in which a subject is asked to generate an agenda and deal with it over nine interviews. In other words the base line for anxious behavior in this kind of experiment is already very high. Furthermore, certain of the treatments, e.g., introducing the subject into a tiny room and seating him close to a stranger, in themselves generate much tension and sense of vulnerability which generalize to the other settings. So stress was induced not only by the "stress factor" but perhaps more so by the experimenter, room and distance factors.

A complicating factor appears to be the stable personological variable of "anxiety". The apparently serious high-anxious subject participating in this study appeared to be under great stress regardless of the stress condition to which he had been assigned. The relaxed, often wise-cracking, low-anxious subject seemed to maintain self-composure even in the high-stress condition. It seems reasonable to conclude, pending further studies, that personality variables overrode the effects that were induced by the stress variable, per se. In a future study, it would seem useful to experimentally classify subjects according to their stable anxiety level and enter this variable into a randomized blocks design. In this way, anxiety variance would enter an experimental term rather than the error term.

3. The subject population was 36 White male undergraduates, most of whom are residents of Massachusetts, all of whom were students at the University of Massachusetts. It would seem unwarranted to deny that this study allows one to generalize beyond the undergraduate population from which the subjects were drawn. Proxemic patterns are learned not just in school but in the total environment provided by the home and the society in which an individual develops from infancy. So it was assumed that students' experimental behavior would be characteristic of the socio-educational stratum from which they originated. This stratum may be somewhat lower than that from which the modal student comes since it was the reward of \$2.00 which induced most of the participants to cooperate.

In terms of subject selection, the most serious limitations appear to be related to sex, race and age. That proxemic behavior

co-varies with these factors is highly probable, to say the least. Consequently, replications of this study are necessary among populations with other sexual, racial and age characteristics and/or combinations of these characteristics.

4. Related to the issue of obtrusiveness is the issue of "experimental analog". If the aphorism "all arguments by analogy are suspect" is true, then equally true would be the statement "all experiments with analogs are suspect". The reason for this would be the same in both instances, to wit: to extrapolate conclusions beyond the area of the analog risks neglecting, often deliberately, the influence of those variables in which the analogs differ. To use an example, Horowitz, et. al. (1964) demonstrated that people, both normal and schizophrenic, approach inanimate objects closer than they approach other human beings, a coatrack "of semi-human proportions", for example, closer than another person. To use an analog technique such as "doll figure placement" or (a more extreme example) silhouette or felt figure placement to determine interpersonal spacing preferences runs high risks. Placing two felt figures in spatial relation to one another may be less threatening to a subject than approaching a coatrack. It makes almost total abstraction of the kinesthetic, visual, thermal and olfactory dimensions of actual interpersonal actions, relying on remembered real life responses in analogous situations.

This study was an analog experiment; it was not a naturalistic replication of counseling sessions or dyadic interviews. To the extent that the experimental conditions in this study departed from their natural analogs, to that extent is the external validity of this experiment jeopardized.

Suggested Further Research

There is a limitless array of studies which could evolve from this one. One could simply begin to systematically introduce other proxemic variables such as body orientation, temperature, lighting, voice loudness, furniture and its arrangement, number of interactants and so forth and measure their influence on language and paralanguage criteria.

But what seems of greater importance is to understand how different populations respond differentially to different systems of proxemic variables. For example, Martin Markey (1971) found that as children grew older they tended to increase social distance norms. It would be useful to know if this trend continues into adulthood and through the entire life cycle. If so, there would have to be commensurate changes in the structure and modalities of interviews of various kinds for persons of various age levels.

Perhaps of greater urgency is the need to learn how Blacks, Whites, Mexican-Americans, Indians, and other distinctly different ethnic and racial populations respond differently to different proxemic and kinesic conditions. The mistake perennially made in the past was to design every learning/teaching situation according to the linguistic, proxemic, cognitive, affective and other social norms of the White middle-class bourgeois. That this has had serious negative consequences in education has been well-documented (e.g., Silberman, 1964). That it has equally serious consequences in those areas of the national life that require members of diverse origins to work together in close contact with one

another, whether this be in a therapeutic, business, or public administrative milieu seems patently certain.

Of less urgency, but equal relevance and interest, would be research into the proxemic patterns of women as opposed to men; of urban as opposed to rural populations; of persons who come from authoritarian as distinguished from permissive households; from large families or small families; from polychronic (loose time structuring) or monochronic (rigid scheduling) social backgrounds and so forth. The important issue in all such studies would be to determine the proxemic setting that was optimal (given the ends of the transaction) in terms of facilitating the flow of information with a minimum of distortion and emotional abrasion.

Summary and Conclusions

This study in proxemics provided additional empirical evidence of the effect of interpersonal distance and room size on certain verbal and visual behaviors of interviewees. Using a 3 X 3 X 3 X 3 mixed factorial analysis of variance design, it was found that subjects who were interviewed at a very close distance (thirty inches) spoke for less time and uttered fewer words than when they were interviewed at a moderate (fifty inches) or far distance (eighty inches). Velocity of speech was unaffected except as experimenters interacted idiosyncratically with the distance factor. Duration of eye contact was a function of interaction as previous studies indicated.

It was further found that verbal behavior was unaffected by the stress factor or by the size of the room. Eye contact, however, was affected by size of room in such wise that it was reduced in the largest room and increased in the medium and small rooms.

Stress, as it was induced in the study, exerted no significant effects on any of the criterion variables.

This study, therefore, clearly indicates that the size of room and the interpersonal distance which are used in an interview have a significant influence on the fluency of speech and the visual behavior of an interviewee. It seems reasonable to conclude that one should avoid a "normally" inappropriately close interaction distance. Thirty inches between dyads is clearly an example of a distance which not only does not facilitate the flow of verbal information but, indeed, impedes it. Interviews among relative strangers seem to require that distance or zone which E. T. Hall designates as the "close phase of social distance", to wit, 48" to 84". It seems to be most facilitative of verbal fluency, particularly at the lower end of that continuum.

There seems to be consensus that personal involvement in a dyadic relationship is facilitated by eye contact. There are, of course, exceptions to this, but generally one may say that the more intense is visual interaction, the more involved, cognitively and affectively, are the dyads in their relationship. Granted this assumption, the findings of this study indicate relative to eye contact that interviews should take place at a far distance. There are, as we have seen, countervailing reasons for using a moderate distance (e.g., to increase verbal fluency). One thing seems incontrovertible: the close distance is disruptive in all criteria measured and should normally be avoided.

As regards room size, the evidence suggests that a medium size room (say, 12' x 12') facilitates visual interaction by comparison with the large room. So does a tiny room (say, 8' x 8'), but there are

reasons, it seems, which nullify this advantage, to wit, the sense of being cramped in a confining space.

Finally, since interviewer effects interact vigorously with distance and, indeed, other situational factors, it would seem to behoove each counselor or interviewer to be acutely aware of the manner in which he affects persons of varying temperaments and needs in different settings. He should be flexible enough to adjust the interview setting so as to facilitate not only the flow of information between dyads but also the growth of rapport so necessary to attain the ends of the interaction (Horowitz, 1965).

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A P P E N D I X

Instructions for Participants
(High Stress)

This is a study of interview behavior. There are reasons to believe that your intelligence can be assessed by such behavior. Moreover, we judge that the way in which you act, both verbally and nonverbally, will be predictive of your success, or lack of it, in a placement interview. It will be a measure of your ability to get a good job.

A highly skilled interviewer will meet with you in nine successive interview situations. We would like you to speak freely and candidly on any issues you wish to, whether they be personal, public, academic, or political. If you wish, you may initially begin to discuss the quality of student life on the UMass campus, the social, financial, academic problems facing today's student, pressures to conformity, quality of teaching, administration, and so forth.

The interviewer's role is principally one of an observer. He will say very little and he will not answer direct questions.

Each session will last three minutes and take place in a different setting. The sessions will be tape-recorded. The content of what is said is less important than the total manner. We trust that the participants will simply act naturally and authentically. The recordings will be treated as confidential and, indeed, anonymous; they will be erased as soon as the experimental data are extracted from them. We ask that you disregard the "mike" and the other experimental apparatus which may be lying about.

Following the ninth session, we ask that you answer a brief (two-minute) questionnaire.

We are grateful for your cooperation.

Instructions for Participants
(Medium Stress)

This is a study of interview behavior. We have reasons to believe that your level of social adaptiveness and poise can be measured by such behavior.

A highly skilled interviewer will meet with you in nine successive interview situations. We would like you to speak freely and candidly on any issues you wish to, whether they be personal, public, academic or political. If you wish, you may initially begin to discuss the quality of student life on the UMass campus, the social, financial, academic problems facing today's student, pressures to conformity, quality of teaching, administration, and so forth.

The interviewer's role is principally one of an observer. He will say very little and he will not answer direct questions.

Each session will last three minutes and take place in a different setting. The sessions will be tape-recorded. The content of what is said is less important than the total manner. We trust that the participants will act simply and naturally. The recordings will be treated as confidential and, indeed, anonymous; they will be erased as soon as the experimental data are extracted from them. We ask that you disregard the "mike" and the other experimental apparatus which may be lying about.

Following the ninth session, we ask that you answer a brief (two-minute) questionnaire.

We are grateful for your cooperation.

Instructions for Participants
(Minimal Stress)

We are studying the interview behavior of students in different settings in order to learn what conditions will be most helpful to them.

Another student will meet with you in nine successive interview situations. We would like you to speak freely and candidly on any issues you wish to, whether they be personal, public, academic or political. If you wish, you may initially begin to discuss the quality of student life on the UMass campus, the social, financial, academic problems facing today's student, pressures to conformity, quality of teaching, administration, and so forth.

Your partner's role is principally one of an observer. He will say very little and he will not answer direct questions.

Each session will last three minutes and take place in a different setting. The sessions will be tape-recorded. The content of what is said is less important than the total manner. We trust that the participants will act simply and naturally. The recordings will be treated as confidential and, indeed, anonymous; they will be erased as soon as the experimental data are extracted from them. We ask that you disregard the "mike" and the other experimental apparatus which may be lying about.

Following the ninth session, we ask that you answer a brief (two-minute) questionnaire.

We are grateful for your cooperation.

