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THE EFFECTS OF PHYSICAL SETTING AND SEX COMPOSITION ON THE PROXEMIC BEHAVIOR OF AMBULATORY AND STATIONARY DYADS

A Dissertation

Presented for the

Doctor of Philosophy

Degree

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Patricia Lee Hudspeth Seipp

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DEDICATION

This dissertation is dedicated to my husband, Raymond Havens Seipp. I shall always be grateful to him for his advice, encouragement, and extraordinary patience during this period of my life.

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ABSTRACT

The purpose of this research was to investigate the effects of physical setting and sex composition on the proxemic behavior of ambulatory and stationary dyads. Two studies were conducted. The first study examined the effects of interior setting size and sex composition on the interpersonal distancing behavior of ambulatory dyads. The second study investigated the effects of sociopetal/sociofugal spatial arrangements and sex composition on the interpersonal distancing, orientation, and visual behaviors of dyads engaging in stationary social interactions.

In the first study, the shoulder to shoulder distances of 60 male, 60 female, and 60 mixed sex dyads were unobtrusively observed as the dyads ambulated within either a small (9.5 x 72 feet) or large (19 x 168 feet) hallway. While there were no significant differences in interpersonal distances due to dyadic sex composition, the size of the interior setting did significantly affect interpersonal distancing behavior. Significantly smaller shoulder to shoulder distances were observed in the small hallway ($\overline{X}$ = 7 inches) than in the large hallway ($\overline{X}$ = 14 inches). This finding was interesting because, clearly, the small interpersonal distances occurring in the small hallway were not a function of physical necessity. Thus, while this study demonstrated that the physical size of an interior environment can affect proxemic behavior, more research is needed to determine whether the rather small interpersonal distances observed in the small hallway

were caused by an intimacy implied by the smaller setting, or whether they were caused by the individuals' reluctance to walk close to walls.

In the second study, the interpersonal distances, shoulder orientations, and visual behaviors of 40 male, 40 female, and 40 mixed sex dyads were unobtrusively observed, at 10 second intervals, as the dyads engaged in social interactions within a campus building foyer (sociofugal space) or within a campus lounge (sociopetal space). The effects of setting on proxemic behavior were pervasive. Interpersonal distances were significantly smaller, orientations were significantly more direct, and the percentages of time spent in facial regard and mutual facial regard were significantly greater in the sociofugal foyer than in the sociopetal lounge. These findings suggest that more immediate behaviors were necessary within a sociofugal space than within a sociopetal space in order to keep the dyads focused within an environment that was pulling them apart.

Dyadic sex composition also affected proxemic behavior. Females looked at their coactors significantly more than males, regardless of the coactor's sex. Additionally, female dyads adopted significantly closer interpersonal distances than male dyads while male dyads assumed significantly more direct orientations than female dyads. So, at least with respect to distancing and orientation behaviors, male and female dyads were achieving comparable levels of proxemic immediacy, but using different modes to do so. There were also significant sex by setting interactions indicating that the direction of sex differences in distancing behavior and orientation behavior were not the same within the sociofugal and sociopetal spaces.

Three corollaries of the Immediacy System were also tested. The data from the study provided significant support for the corollary that closer interpersonal distances should be associated with less direct orientations. However, contrary to the predictions of the theory, greater amounts of looking behavior were associated with smaller interpersonal distances, and greater amounts of looking behavior were associated with more direct orientations. The fact that the data from this field study provided little support for the Immediacy System Theory (which has received considerable support from laboratory investigations) suggests that the dynamics of the proxemic behavior system may not be the same in the laboratory as they are in the field where all proxemic behaviors vary naturally.

Finally, the data from the second study revealed that proxemic behaviors significantly changed over the course of social interactions. Analyses of behaviors at the first, middle, and last coding periods of the interactions revealed that interpersonal distances increased and looking behavior decreased over the course of interactions, while orientations were more direct at the middle of interactions than at the beginning or end of interactions. Hence, these data suggest that past findings on proxemic behavior patterns at the onset of social interactions may not be applicable to proxemic phenomena occurring during the course of interactions.

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CHAPTER I

INTRODUCTION

This paper presents two studies of the interrelationships between human behavior and built environments. In the first study, the interpersonal distancing behaviors of 60 male, 60 female, and 60 mixed sex dyads were unobtrusively recorded as the dyads ambulated within either a large hallway (168 feet by 19 feet) or small hallway (72 feet by 10 feet). In the second study, the interpersonal distances, shoulder orientations, and visual behaviors of 40 male, 40 female, and 40 mixed sex dyads were unobtrusively observed, at 10 second intervals, as the dyads engaged in either standing interactions within a campus building foyer, or seated interactions within a campus lounge.

There were three primary areas of concern in the present research. First, both of the studies presented in this paper sought to determine whether physical aspects of interior environments could have an impact on the proxemic behaviors of dyads engaging in similar activities. Secondly, in both studies, the effects of dyadic sex composition on proxemic behaviors were examined. Finally, the second study within this research considered the dynamic aspects of proxemic behavior. That is, the concurrent interrelationships among interpersonal distancing behavior, orientation behavior, and visual behavior, as well as changes in these behaviors over the course of social interactions, were investigated. While the theoretical underpinnings for this research are delineated in detail in the following chapters

of this paper, it is appropriate to make some cursory remarks about the rationale for the present research in this introduction.

The theoretical basis for the environmental aspect of this research rests largely on the work of R. G. Barker (e.g., 1964, 1968). Barker views behavior from an ecological perspective which recognizes that there are interdependencies between environments and behaviors. That is, there are cultural purposes to various types of built environments and certain interior settings are associated with certain types of behaviors. From this recognition of the interrelationships between environments and the behaviors of large numbers of individuals, Barker developed the notion of "behavior settings." Behavior settings consist of the interdependencies between "standing patterns of behavior" and "physical milieu." For example, given the behavior setting of a university campus lounge, the standing patterns of behavior for groups of users of the lounge would include studying, reading, conversing with others, resting, and perhaps eating. The physical milieu of this behavior setting would include tables, chairs and/or couches, and perhaps vending machines or some other source of food and drink. While the standing patterns of behavior are independent from the physical milieu of the setting (for example, people can study within settings other than lounges; and other behaviors, such as colloquium presentations can take place within lounges), changes in either the standing behavior patterns or the physical milieu alters the nature of the behavior setting.

The present research examined the interrelationships between behavior and physical environment from two different perspectives.

The first study investigated whether the size of an interior environment could have an impact on proxemic behavior within two similar behavior settings. That is, in the first study, the size of the space was varied, while the components of the behavior setting (ambulation within hallways) were held constant. The second study investigated how changes in the nature of the behavior setting could influence the proxemic behaviors of dyads engaging in the same type of activity, i.e. stationary social interaction. In this study, the size and shape of the interior space were held constant (both spaces measured approximately 36 feet by 43 feet), but the nature of the physical setting was varied (one space was a lounge, the other was a foyer). In other words, dyads interacting within the lounge setting were engaging in an activity for which the space was designed, while dyads interacting within the foyer setting were engaging in an activity for which the space was not designed. It should be noted that in the present research, the lounge is frequently referred to as a semi-fixed feature setting. The expression "semi-fixed feature" is derived from Hall's observations that Americans treat tables, chairs, etc., as semi-fixed features within interior spaces (e.g., 1963, 1966, 1968). That is, while buildings and walls are considered immovable, fixed features of the environment, furniture is generally considered semi-fixed because it can be moved at the discretion of the users of the space. Within the present research, the foyer is often referred to as an open setting because of the lack of such features within the space.

The present research also gave serious attention to the effects of dyadic sex composition on proxemic behaviors. Consideration of

sex differences was warranted for three main reasons. First, although a number of studies have mentioned sex differences in proxemic behaviors (especially in distancing behavior), sex has generally remained a secondary variable within research designs. That is, while both male and female subjects have frequently participated in studies of proxemic behavior, the primary interests of researchers have typically revolved around situational and social issues, rather than sex difference issues. The resultant variability in the kinds of sex differences reported has precluded the emergence of reliable sex difference patterns. In summarizing the current state of the literature on sex differences, Altman (1975) wrote, "For every study cited that reports sex differences, I could probably cite another study with no sex differences. To really understand the effects of sex characteristics, it is necessary to develop a program of research with sex as a central focus rather than a secondary factor." (pp. 75, 76)

The second reason for comparing the proxemic behaviors of male, female, and mixed sex dyads is that there has been a relative dearth of research comparing the proxemic behaviors of dyads of all three possible sex compositions. The trend has been to compare the proxemic behaviors of male dyads and female dyads (e.g., Aeillo and Jones, 1971; Guardo, 1969; Little, 1968; Russo, 1975), or to compare the proxemic behaviors of same sex dyads and mixed sex dyads (e.g., Ashear and Snortum, 1971; Duke and Nowicki, 1972; Edwards, 1972; Meisels and Guardo, 1969).

Finally, the examination of sex differences in proxemic behavior in the first study contributes to the literature because

there is no information about the effects of dyadic sex composition on the interpersonal distancing behavior of ambulatory individuals. Past research on distancing behavior within ambulatory situations has focused on sex differences in reactions to frontal invasions, rather than on sex differences in naturally occurring interpersonal distancing behavior (Knowles, 1972; Sobel and Lillith, 1975).

The third major purpose of the present research was to investigate the dynamics of proxemic behaviors, both in terms of the concurrent interrelationships among proxemic behaviors, and in terms of how these behaviors may change over the course of social interactions. There are three shortcomings in the present state of the literature regarding the concurrent interrelationships among interpersonal distancing behavior, orientation behavior, and visual behavior. First, there is a need for more research which considers all three of these proxemic behaviors simultaneously. Evidence of this need for more tri-modal research is illustrated in Patterson's (1973) review in which he reports that only two out of 19 studies considering the interrelatedness of distancing, orientation, and visual behavior examined all three of these behaviors simultaneously. Secondly, there have been contradictory findings reported with respect to the interrelationships among these behaviors. For example, there have been investigations suggesting that more direct orientations are associated with greater amounts of facial regard (Beach and Sokoloff, 1974; Mehrabian, 1968a, 1968b), and other investigations suggesting that more direct shoulder orientations are associated with smaller amounts of facial regard (Patterson, 1973a; Watson and Graves, 1966).

The third difficulty with the research in this area is the almost total absence of field investigations. There is a need to examine the interrelationships among these behaviors as they occur within natural settings, without the imposition of experimental manipulations.

Research considering changes in proxemic behaviors over the course of social interactions is also needed. In the preponderance of the investigations of proxemic behavior, the behaviors of individuals have been recorded at only one point in time (e.g., Adler and Iverson, 1973; Baxter, 1970; Dosey and Meisels, 1969; Melson, 1976; Pellegrini and Empey, 1970; Tennis and Dabbs, 1975). Consequently, information about how proxemic behaviors may change at the beginning, middle, and end of social interactions, as well as information about how people may nonverbally signal the terminations of interactions, remains limited.

Inasmuch as proxemic behaviors constitute the primary dependent variables in the present research, it is appropriate also to include a discussion of the proxemic behavior system in this introductory chapter. Edward T. Hall (1963) coined the term "proxemics" to describe the study of the ways in which people communicate through the structuring of space. More specifically, Hall defines proxemics as:

> the study of how man unconsciously structures microspace--the distance between men in the conduct of daily transactions, the organization of space in his houses and buildings, and, ultimately the layout of his towns. (1963, p. 1003)

Through proxemic behavior, people are able to regulate the degree of sensory information that may be exchanged with others. As Hall (1963, 1968) and O. M. Watson (1972) have both emphasized, it is important

to recognize that "proxemic behavior is a system of interrelated variables" (Watson, 1972, p. 231). These "dimensions" (Hall, 1963) of proxemic behavior include a number of different variables. First, shoulder orientation affects the amount of sensory information that is exchanged within social interactions. Secondly, kinesthetic factors, i.e. "the potential to strike, hold, caress, or groom" (Hall, 1963, p. 1009), as determined by the distance between the interactants, constitute a dimension of proxemics. Thirdly, the presence or absence of touching behavior, as well as type of touching behavior, influence the degree of "closeness" between two individuals. Fourthly, the "amount of visual contact, from eye-to-eye to gazing off into space" (Watson, 1972) has an impact on information exchange. Fifthly, olfaction (the degree to which one person is able to detect odors from the body or breath of the other person) is a variable within the proxemic system. Sixthly, thermal factors (the degree to which a person can detect the body heat of another person) play a role in proxemics. Seventhly, the voice level of the interactants influences the degree of information exchange within interactions. Finally, Hall regards postural-sex identifiers as a variable within the proxemic system. This variable includes both the sex and general posture (standing, sitting, squatting, or prone) of the interactants. The present author concurs with Watson's contention that the posture and sex of the interactants do not fall within the realm of proxemic behavior. With regard to the inclusion of this factor within the proxemic behavior system, O. M. Watson (1974) wrote,

> Although Hall (1963b) treats this variable as belonging in the proxemic syndrome, it is my contention that it

> should not be considered as a part of the system. This is not to say that an interactant will not respond proxemically to the sex and posture of another person, but I maintain that these responses will be made, in this case, to variables outside of proxemic. The posture and sex of interactants is more usefully treated as a part of the context in which proxemic behavior takes place. (1974, p. 322)

Hall maintains that the degree of sensory information exchange that takes place within social interactions is largely a function of the distance between the interactants. He has specified four spatial zones that are (a) associated with different types of social interactions and (b) associated with different levels of sensory information exchange. Inasmuch as spatial behavior is socially learned and culture-specific, it is important to note that these zones were derived from Hall's observations of Anglo-Americans from the Northeastern seaboard.

Hall has labeled the closest spatial zone for interaction as the "intimate distance zone." As the term suggests, intimate interactions occur within this zone. Intimate distances range from 0 to 18 inches; the close phase of the intimate distance zone ranges from 0 to 6 inches; the far phase of this zone ranges from 6 - 18 inches. In describing the richness of sensory information that is exchanged within the intimate zone, Hall wrote,

> At intimate distance, the presence of the other person is unmistakable and may at times be overwhelming because of the greatly stepped-up sensory inputs. Sight (often distorted), olfaction, heat from the other person's body, sound, smell, and feel of breath all combine to signal unmistakable involvement with another body. (1966, p. 116)

The second spatial zone Hall discusses is the "personal distance zone." This zone spans from 1½ to 4 feet, and contains a close phase (1½ to 2½ feet) and a far phase (2½ to 4 feet). The close phase of

the personal distance zone is reserved for intimates. As Hall wrote, "A wife can stay inside the circle of her husband's close personal zone with impunity. For another woman to do so is an entirely different story." (1966, p. 120) In the far phase of this zone, subjects of personal interest are discussed.

The third spatial zone is the "social distance zone" which ranges from 4 to 12 feet. Within the close phase of this zone (4 to 7 feet), social interactions concerning impersonal business occur. In the far phase of this zone (7 to 12 feet), business and social discourse take on a more formal tone than in the close phase.

The fourth zone is the "public distance zone" which is comprised of interpersonal distances greater than 12 feet. Public distances are used within public situations such as speech presentations, and within interactions with important public figures.

In terms of the present research, then, Hall's spatial zones can provide clues about what kinds of social interactions tend to occur within semi-fixed feature spaces and open spaces.

In concluding this introductory chapter, it is fitting to forecast the content of the following seven chapters of this paper. Chapter II reviews the literature concerning interpersonal distancing behavior. Chapter III reviews the current state of knowledge concerning visual behavior during social interactions. Chapter IV both describes and reviews the empirical support for the Immediacy System Theory which attempts to relate distancing behavior, orientation behavior, and visual behavior into a single system through which people are able to establish and maintain desired levels of psychological closeness,

or intimacy, with others. Chapter V reviews the limited amount of information that is available on the effects of physical settings on proxemic behavior. Chapter VI presents the study concerning the effects of dyadic sex composition and size of setting on the interpersonal distancing behavior of ambulatory dyads. Chapter VII presents the study of the effects of dyadic sex composition and type of setting on the proxemic behavior of dyads engaging in social interactions.

CHAPTER II

INTERPERSONAL DISTANCING BEHAVIOR

Interpersonal distancing behavior has undoubtedly enjoyed more attention from researchers than any other mode of proxemic behavior. While one can only speculate, there seem to be at least three probable reasons why distancing behavior has been investigated more than either orientation behavior or visual behavior. First, there seems to have been a general lack of recognition that proxemic behavior is not simply distancing behavior, but is rather a system of behaviors through which people structure space in their communication with others. It has been only relatively recently that researchers (e.g., Aeillo and Aeillo, 1972; Aeillo and Jones, 1972; Forston and Larson, 1968; Watson, 1972, 1974) have realized that there are "five categories which operationally define the system of proxemic behavior" (Watson, 1974, p. 328). These categories include orientation behavior, visual behavior, touching behavior, and voice loudness, as well as interpersonal distancing behavior.

A second possible reason for the large number of investigations on interpersonal distancing behavior is the relative ease in recording distancing behavior in comparison to recording orientation and visual behavior. In the case of simulation studies, the researcher simply measures interfigure distances with a ruler. In the laboratory,

researchers often use measuring tapes or floor grids in recording the interpersonal distances between subjects or the chairs on which they sat. Even in the field, distancing is generally more easily recorded than orientation or visual behavior because observers may "check" their measurements against physical features in the environment (such as tile widths). In contrast, the observation of orientation and visual behavior is more difficult because there are no such guiding objective gauges when one is attempting to record shoulder orientation or whether the subjects are looking at, or away from, each other.

Finally, interpersonal distancing behavior may have invited a great amount of attention because it seems to be sensitive to a wide variety of social and situational factors. Interpersonal distancing behavior has been demonstrated to be influenced by cultural factors (e.g., Frankel and Barrett, 1971; Hall, 1968; Scherer, 1974; Baxter, 1970), personality factors (Blumenthal and Meltzhoff, 1967; Cook, 1970; Fisher, 1967; Kinzel, 1970; Luft, 1966; Patterson and Holmes, 1966; Williams, 1971), physical stigma (Comer and Piliavin, 1972; Wolfgang and Wolfgang, 1971), the social relationship between the interactants (Aeillo and Cooper, 1972; Mehrabian, 1971; Tedesco and Fromme, 1974), and the nature of the social interaction (Karabenick and Meisels, 1972; Rosenfeld, 1965).

This chapter reviews the information on sex differences in interpersonal distancing behavior that has been produced by laboratory, simulation, and field investigations. The review is organized into sections on the basis of these three different methodological approaches

because, in some cases, different research strategies have been employed to investigate different issues. For example, while sex difference patterns in spatial reactions to negatively toned social situations have emerged from simulation studies, field studies have yielded little information on this issue because of the difficulty in manipulating the tone of social situations within field settings. Conversely, field studies have addressed such questions as sex differences in reactions to spatial invasion, an issue simulation strategies would find difficult to handle.

But while there are differences in the kinds of issues that have been addressed by laboratory, simulation, and field investigations, there are also commonalities. All three types of research strategies have been employed to study sex differences in dyadic distancing behavior and sex differences in approach distancing behavior. Dyadic distancing behavior is conceptually different from approach distancing behavior. In dyadic distancing, both members of the dyad are operative in establishing the interpersonal distance. In approach distancing, the action of only one person, the approacher, determines the interpersonal distance; the other member of the dyad remains stationary. Moreover, in approach distancing studies, interpersonal distancing behavior is recorded at only one point in time, usually at the onset of the social interaction. In dyadic distancing studies, the researcher is often interested in taking multiple recordings of distancing behavior during the course of the interaction.

In spite of the fact that the research in this area has been quite varied with respect to both the methodologies employed and the

specific issues addressed, three major sex difference patterns germane to the present research will emerge from this review. First, people of both sexes tend to prefer closer approach distances to females than to males. Secondly, female dyads tend to display both closer approach distances and closer dyadic distances than male dyads. Finally, mixed sex dyads tend to exhibit both closer approach distances and closer dyadic distances than same sex dyads. (This last sex effect is seen mainly in adults; children seem to prefer closer interpersonal distances with others of the same sex compared to others of the opposite sex.)

Laboratory Investigations of Sex Differences in Interpersonal Distancing Behavior

Laboratory research of sex differences in interpersonal distancing behavior has focused mainly on two issues. First, sex differences in approach distancing behavior have been given a considerable amount of attention by laboratory researchers. In investigations of approach distancing preferences, the researcher is interested in the distance to which one person approaches another, stationary, person in order to engage in social interaction. The second main issue that has been investigated through laboratory techniques concerns sex differences in dyadic distancing behavior. In studies of dyadic distancing preferences, the interpersonal distances adopted by pairs of people as they engage in social interactions are observed within laboratory situations.

The following review of laboratory studies of sex differences in interpersonal distancing preferences is organized on the basis of

these two main areas of concern. That is, the first part of this laboratory study review focuses on findings regarding sex differences in approach distancing behavior, while the second part of the review concentrates on findings regarding sex differences in dyadic distancing behavior. Inasmuch as the present research is concerned with the spacing behavior of both standing and seated dyads, the review considers distancing behavior within both these types of situations.

Laboratory investigations of approach distancing preferences. The vast majority of laboratory investigations of interpersonal distancing behavior have focused on approach distancing preferences as opposed to dyadic distancing preferences. Perusal of these approach distancing studies reveals three themes concerning sex differences. The first of these themes is that people of both sexes tend to approach females more closely than they approach males. One laboratory study which reported this effect was conducted by Mehrabian in 1968. In his study, he asked male and female undergraduates to imagine that a hat rack was either a male or female addressee, and to approach the hat rack to a comfortable distance for a conversation. The results from the study revealed that both males and females approached the hat rack at significantly closer distances when the hat rack was described as a female addressee than when it was described as a male addressee.

Barrios, Corbitt, Estes, and Topping (1976) have reported that others approach females more closely than males within seated situations as well. These researchers were interested in the effects of sex and social stigma (bisexuality) on seated approach distances.

The data from the study revealed that subjects of both sexes approached confederates described as non-stigmatized at significantly closer distances than they approached confederates described as stigmatized. There was also a significant main effect for the sex of the confederate; both male and female subjects approached female confederates more closely than they approached male confederates.

There is some evidence that females are approached more closely than males because females tend to allow others to approach them at closer distances than males do. In a study by Harnett, Bailey, and Gibson (1970), male and female undergraduate subjects assumed stationary standing positions while male or female confederates approached them from different angles. The subjects were instructed to tell the experimenter when the confederate had reached a comfortable interpersonal distance. The results from the study indicated that, compared to male subjects, female subjects allowed closer approach distances by both male and female confederates.

Finally, the work of Giesen and Hendrick (1977) provides support for the notion that both males and females prefer closer approach distances to females than to males. In their study, subjects were "assigned" seated approach distances that were either close (approximately 1 foot) or far (approximately 5 feet) from a male or female confederate. Subjects of both sexes rated the female confederate significantly more favorably when they were close to her than when they were far away from her. Conversely, subjects of both sexes rated the male confederate significantly more favorably when they were far away from him than when they were close to him.

The second sex difference pattern that emerges from laboratory investigations of approach distancing preferences is that females approach females at closer distances than males approach males. One of the laboratory studies which reported this phenomenon was conducted by Tennis and Dabbs in 1975. They recorded the standing approach distances of same sex dyads of first, fifth, ninth, and twelfth graders and college sophomores within a laboratory setting. The researchers reported a significant main effect for sex composition with females approaching females at significantly closer distances than males approached males.

The same sex composition effect was reported in a multi-phase investigation conducted by Dosel and Meisels (1969). They examined the effects of dyadic sex composition and stress on the standing approach distances of undergraduates. Both independent variables proved to affect spatial behavior. In the stress condition (in which subjects were told that their physical attractiveness was being judged), both males and females approached others at significantly greater distances than in the non-stress condition. Additionally, there was a main effect for the sex composition of the dyad; female dyads consistently exhibited closer approach distances than male dyads.

Female dyads seem to prefer closer approach distances than male dyads within seated situations as well. For example, this sex effect was reported by Pellegrini and Empey in 1970. They asked 30 male and 30 female undergraduates to freely seat themselves in relation to a stationary, same sex confederate in order to engage in a conversation. The results from the study indicated that the

approach distances were significantly smaller for female dyads than for male dyads.

Adler and Iverson (1973) also reported this sex difference in seated approach distancing preferences. In their laboratory study, which involved a total of 216 undergraduate subjects, female subjects approached female confederates at significantly closer distances than male subjects approached male confederates.

The third major theme concerning sex differences in approach distancing behavior is that approach distances tend to be smaller for mixed sex dyads than for same sex dyads. For example, in a laboratory investigation of the approach distancing behavior of 102 fifth and sixth grade children, Bailey, Harnett, and Glover (1973) reported that male subjects approached a female undergraduate interviewer at significantly closer distances than did female subjects. Schwartzwald, Kavish, Shoham, and Waysman (1977) reported the same sex composition effect in their laboratory study of approach distancing behavior. In their study, undergraduate male subjects approached female confederates at significantly closer distances than they approached male confederates. Finally, Whalen, Flowers, Fuller, and Jernigan (1973) also reported that approach distances were smaller for mixed sex dyads than for same sex dyads. Specifically, they found that female eighth graders would allow male peers to approach them at significantly closer distances than female peers.

It is interesting to note here that although approach distances tend to be smaller for mixed sex dyads than for same sex dyads, there is some evidence that people are more aroused when they are approached by someone of the opposite sex as opposed to someone of the same sex.

In a laboratory study conducted by McBride, King, and James (1965) subjects' galvanic skin responses (GSR) were recorded as the subjects were approached by either a male or female confederate. The researchers reported that the arousal levels of both male and female subjects were greater when the approacher was of the opposite sex than when the approacher was of the same sex.

Laboratory investigations of dyadic distancing preferences. Laboratory investigations dealing with sex differences in dyadic distancing behavior have focused mainly on the distancing preferences of male and female dyads. On the basis of laboratory studies of approach distancing preferences, it would be expected that female dyads would exhibit closer dyadic distances than male dyads. However, laboratory studies dealing with sex differences in the dyadic distancing behavior of standing interacting dyads have produced somewhat inconsistent results. Watson (1966), for example, reported no sex differences in the dyadic distancing behavior of White males and females. In his study, he observed the interpersonal distances, orientations, visual behaviors, and voice loudness of dyads of Black and White college students as they engaged in standing interactions within a laboratory situation. He reported no behavioral differences between While males and females other than "a slight association between females and less voice loudness" (p. 237).

In contrast, Jones and Aeillo (1973) reported data indicating that female dyads prefer greater dyadic distances than male dyads. They conducted a study in which same sex dyads of Black and White children from the first, third, and fifth grades were asked to stand

and discuss their favorite television commercial. While the dyads were engaging in the standing conversations, an unobtrusive observer recorded the interpersonal distances and orientations adopted by the dyads at twenty second intervals. With respect to interpersonal distancing behavior, the data indicated that White female dyads interacted at the greatest distances, Black females interacted at the closest distances, and Black and White male dyads interacted at intermediate distances.

While Jones and Aeillo found sex differences in the dyadic distancing preferences of young children, Aeillo and Aeillo (1974) did not. Aeillo and Aeillo observed the proxemic behavior of same sex dyads of children between the ages of six and sixteen as they stood discussing their favorite television program. In contrast to the findings of the Jones and Aeillo study, there were no differences in the spatial behavior of children between six and eleven attributable to the sex composition of the dyads. However, the researchers also reported that beyond age eleven, children began to exhibit "adult proxemic behaviors" (p. 177) such that male dyads interacted at significantly greater distances than female dyads. The researchers wrote that they expected such sex differences in the interpersonal distancing of older children based on studies which have indicated that female dyads prefer greater proximity during interaction than male dyads. It is interesting to note, however, that all of the studies cited as the basis for their expectancy that male dyads would interact at greater distances than female dyads employed either simulation or field methodologies (e.g., Baxter, 1970; Guardo, 1969;

Meisels and Guardo, 1969). There were no citations of other laboratory studies reporting the same direction of sex differences in the distancing behavior of standing dyads.

Both of the laboratory studies reviewed which examined sex differences in seated dyadic distancing behavior reported that female dyads preferred closer interpersonal distances than male dyads. One of these investigations was conducted by Barrios and Giesen in 1977. In their study, two or three same sex subjects engaged in seated interactions with a male confederate. The interpersonal distancing data from the study revealed that the female subjects displayed significantly closer interpersonal distances from one another than did male subjects.

Norum, Russo, and Sommer (1967) also reported closer seated dyadic distances for female dyads than for male dyads. In their study, they asked pairs of subjects to seat themselves around a table in order to perform tasks either in cooperation with one another, in competition with one another, or coactively. The results from the study revealed a main effect for the sex composition of the dyad such that female dyads chose closer dyadic distances than male dyads.

Summary. Table II-1 presents the sex difference patterns which have emerged from laboratory research on interpersonal distancing behavior. As the table illustrates, three major themes appeared. First, the research in this area has suggested that people of both sexes prefer closer approach distances to females than to males. Secondly, both approach distancing and dyadic distancing investigations

TABLE II-1

SUMMARY OF LABORATORY RESEARCH ON SEX DIFFERENCES IN INTERPERSONAL DISTANCING BEHAVIOR

Study (type of distancing behavior investigated)	Others preferred closer approach distances to females than to males	Interpersonal distances were smaller for female dyads than for male dyads	Interpersonal distances were smaller for mixed sex dyads than for same sex dyads
Adler and Iverson, 1973 (approach)	..	+	..
Aeillo and Aeillo, 1974 (dyadic)	..	0, +	..
Bailey et al., 1973 (approach)	..	..	+
Barrios and Giesen, 1977 (dyadic)	..	+	..
Barrios, et al., 1976 (approach)	+	..	..
Dosey and Meisels, 1969 (approach)	..	+	..
Giesen and Hendrick, 1977 (approach)	+	..	..
Harnett, et al., 1970 (approach)	+	..	..

TABLE II-1 (Continued)

Study (type of distancing behavior investigated)	Others preferred closer approach distances to females than to males	Interpersonal distances were smaller for female dyads than for male dyads	Interpersonal distances were smaller for mixed sex dyads than for same sex dyads
Jones and Aeillo, 1973 (dyadic)	..	-	..
Mehrabian, 1968a (approach)	+	..	..
Norum, et al., 1967 (dyadic)	..	+	..
Pellegrini and Empey, 1970 (approach)	..	+	..
Schwartzwald, et al., 1977 (approach)	..	..	+
Tennis and Dabbs, 1975 (approach)	..	+	..
Watson, 1966 (dyadic)	..	0	..
Whalen, et al., 1973 (approach)	..	..	+

+ Effect appeared to a significant degree.

- Opposite effect appeared to a significant degree.

0 No sex differences appeared.

..Effect was not under investigation.

have indicated that interpersonal distances tend to be smaller for female dyads than for male dyads. Finally, laboratory research of sex differences in interpersonal distancing behavior has suggested that interpersonal distances tend to be smaller for mixed sex dyads than for same sex dyads.

The following two sections of this chapter will indicate that these three sex difference themes generally prevail, regardless of the methodological strategy employed by the researchers.

Simulation Investigations of Sex Differences in Interpersonal Distancing Behavior

A number of researchers have employed simulation techniques in investigating interpersonal distancing preferences. In simulation studies, subjects are asked to place two, or three, dimensional figures in relation to one another under different situational and social conditions. By examining the inter-figure distances chosen by the subjects, researchers are able to gain information about people's interpersonal distancing preferences within various types of situations.

The following review of simulation research on sex differences in interpersonal distancing preferences is divided into two main sections based on the type of instructional set which was given to the subjects. The first section reviews simulation studies in which the subjects were asked to position both figures on a field simultaneously. This type of instructional set simulates dyadic distancing preferences. The second section reviews simulation studies in which the subjects were asked to place one manipulable figure in relation to a pre-placed figure. This type of instructional set simulates approach distancing preferences.

Although the simulation investigations cited in this chapter vary considerably with respect to both the specific issues addressed and the specific methodologies employed, two major themes concerning sex differences will become apparent. First, the studies reviewed will reveal that prepubescent children tend to place same sex pairs of figures closer together than opposite sex pairs of figures, while adolescents and adults generally place opposite sex figures closer together than same sex figures. Secondly, the studies will indicate that females generally prefer greater inter-figure distances than males when the social situation is described as negatively toned (e.g., when the figures are described as representing two people who are angry with one another).

Simulation investigations of dyadic distancing preferences. One of the earliest investigations of interpersonal distancing preferences involved the dyadic type of simulation task. In 1963, Kuethe and Stricker conducted a study which entailed the placement of human figures as well as geometric symbols on a felt background. This research was undertaken in order to examine the social schemata of males and females within the white American culture. The notion of social schema, which has been discussed by Kuethe, and also by Little (e.g., 1965 and 1968), is based on the idea that simulated interpersonal distances are reflective of actual interpersonal distancing preferences, and that "when subjects are allowed to place figures on a field, their responses are organized rather than scattered or random" (Kuethe and Stricker, 1963, p. 655). In Kuethe and Stricker's study, each of fifty male and fifty female undergraduate subjects was instructed to place

human figures and/or geometric symbols on a felt background under a variety of conditions. Overall, the spatial organization patterns of the figures were similar for male and female subjects in most conditions (which included the placement of one man and two women; two men and one woman; and a man, woman, boy, and girl). Of particular interest was the way in which subjects positioned four silhouettes, representing two women and two men. The majority of both male and female subjects organized the figures with male silhouettes next to female silhouettes, as opposed to grouping same sex silhouettes together.

In Kuethe and Stricker's study, there was only one situation in which there were significant differences for sex of subject. When instructed to position three rectangles of varying sizes, 89 percent of the male subjects ordered the rectangles according to size, while only 36 percent of the females did so. Twenty-six percent of the females, compared to 1 percent of the males, placed the large rectangle in the middle: and idiosyncratic designs were generated by 28 percent of the females and only 8 percent of the males. Kuethe and Stricker suggested that the higher frequency of idiosyncratic design formation in female subjects reflects a difference in creativity levels in the two populations. This author would take that notion a step further and point out that the middle positioning of the large rectangle by females is also compatible with their suggestion that females tend to be more artistic in that it is a well established convention in art to put most of the visual weight of a composition in the center so as to draw the eye there and to prevent the work from appearing as though it is about to "tip over." It is interesting

to note that Carlson and Price (1966) have also reported sex differences in the placement of geometric figures. Their subject sample included children seven to eleven years old, adolescents thirteen to sixteen years old, and adults twenty-five to fifty years old. When the subjects were asked to freely place a triangle, circle, and square on a feltboard, the male subjects were significantly more likely than females to create vertical arrangements with the symbols, while female subjects exhibited greater variability in symbol arrangement. Moreover, the researchers reported, this sex difference became stronger with age. These results, then, dovetail those of the Kuethe and Stricker study by again suggesting that males prefer orderly arrangements of symbols to the variable creative arrangements apparently preferred by females.

Simulation research on dyadic distancing preferences has also been conducted employing three dimensional techniques, i.e., doll placement. One such study was performed by Little (1968) who examined sex and cultural differences in dyadic figure placement in a sample of undergraduates from five universities. He asked male subjects to position two male dolls, and female subjects to position two female dolls under a variety of situation descriptions. With respect to sex differences in figure placement, Little had hypothesized that American females would choose closer interfigure distances than American males. This hypothesis was based on previous references to sex differences by such researchers as Robert Sommer, who wrote in his review, "Small group ecology" (1967), "The idea that females tolerate closer physical presence than males is underscored by the observations of women holding hands or kissing one another, practices

which are uncommon between males in this culture" (p. 634). However, the analysis of main sex effects indicated that while Greek and Italian men placed male dolls at significantly greater distances than women from those countries placed female dolls, and Swedes demonstrated no sex differences, American and Scottish males placed male dolls at significantly closer distances than their female counterparts placed female dolls. This finding, then, is inconsistent with the general assumption that females in our culture prefer closer proximity than males.

Koslin, Koslin, Paragament, and Bird (1971) are among the researchers who have reported that interpersonal distancing preferences change at the onset of adolescence. They employed both dyadic figure placement and approach figure placement techniques in their simulation study of the interpersonal distancing preferences of subjects from the first through twelfth grades. Under both dyadic distancing and approach distancing types of instructional sets, male-female combinations of figures were placed at markedly closer distances at the onset of adolescence. That is, young children placed same sex figures closer together than opposite sex figures, while post pubescent subjects placed opposite sex figures closer together than same sex figures.

Two studies seen in the literature employed a modification of the typical dyadic type of simulation methodology. Typically, dyadic instructions ask the subjects to simultaneously place two figures under given conditions. In the modified version of this technique the pair of figures is pre-placed and the subjects are asked to attribute the situation appropriate to the interfigure distance.

In other words, subjects are asked to decode rather than encode simulated interpersonal distances.

One such decoding study which reported sex differences in children's social perceptions of pre-distanced figures was conducted by Post and Hetherington in 1974. Four different pictures of busts of a man and woman standing together were the stimuli presented to forty four year old and forty six year old children. The pictures varied with respect to the distance between the man and woman, and with respect to eye contact which was either present or absent. As all six possible pairings of pictures were presented to the children, they were asked, "Which people like each other best?" The results indicated that while four year old boys and girls used interpersonal distance as a cue for liking, only the girls' perceptions of distancing as a cue for social relationships improved from age four to age six. Four year old children did not score above chance toward eye contact cues, and again, only the girls showed improved social perception of this cue by age six.

Another investigation employing this variation of the dyadic type of simulation task was performed by Melson in 1976. She conducted a two-phase study in which she examined three, four, five, and six year old children's responses to situations which varied in affective tone and in the sex composition of the pairs of figures. In the first segment of the study, she presented the children with pre-placed male, female, and mixed sex pairs of figures that were either .05 m, .1 m, or .15 m from one another. The children were asked to attribute one of three affect conditions to the pair of figures: angry, friendly,

or helping. No sex differences appeared; both boys and girls associated closer distances with friendly situations, intermediate distances with helping situations, and greater distances with angry situations. Moreover, the children did not discriminate on the basis of the sex composition of the pair of figures. In the second part of the study, Melson asked the children to place figures on a feltboard under the same affect and sex composition of dyad conditions (i.e., the children were given the typical type of dyadic distancing instructions). The results were similar to those described above in that the children placed "angry" figures farther away from one another than "friendly" figures. In this phase of the study, however, girls used significantly greater distances than boys for both "angry" male and "angry" female figures. Thus the data from this part of Melson's study provide support for the notion that females place figures farther apart than males when the social situation is described as being negatively toned. Of additional interest was the finding that only the female subjects responded to the sex composition of the pairs of figures by placing "angry" males at significantly greater distances than "angry" females, thus indicating a sensitivity to both affect and sex factors that was not demonstrated by the boys. It is noteworthy that the absence of sex differences in the first, pre-placed figure, phase of Melson's investigation illustrates the sensitivity of subjects' responses to variations in simulation tasks.

Simulation investigations of approach distancing preferences. In contrast to those studies which simulate dyadic distancing preferences are those studies which simulate approach distancing preferences.

In simulation studies of approach distancing preferences, subjects are instructed to position a manipulable figure in relation to a pre-placed figure. Investigations employing this technique have provided additional support for the notion that females prefer greater interfigure distances than males when the situation is negatively toned in some way, as well as additional support for the notion that subjects place opposite sex figures closer together than same sex figures after the onset of adolescence.

One of the simulated approach distancing studies which reported that females chose greater interfigure distances than males in negatively toned situations was conducted by Dosey and Meisels in 1969. They instructed male and female undergraduates to trace a silhouette in relation to a preplaced figure within either a non-stress or stress situation. In the stress condition, subjects were told that they were being judged on physical attractiveness. Results from the study revealed that males and females displayed virtually identical interfigure distances in the non-stress condition. Also, both sexes were significantly affected by the stress manipulation, with females' spatial reaction to the stress being significantly stronger than that of males. Specifically, males positioned the silhouette representing the self an average of 21.7 centimeters from the target figure in the non-stress situation and 45.4 centimeters away in the stress situation, compared to females who placed the figures at the respective average distances of 21.2 and 56.3 centimeters in the non-stress and stress conditions, respectively.

In 1969, Guardo reported further evidence of sex differences in figure placement responses within negatively toned situations.

In her approach simulation study, she asked a sample of male and female sixth graders to place a "self" figure in relation to a preplaced target figure which was described as either the child's best friend, someone the child liked very much, or someone the child feared. The data from the study revealed that females preferred closer interfigure distances than males when the target figure was described as the child's best friend or someone he/she liked very much. However, when the target figure was described as someone the child feared, females preferred significantly greater interfigure distances than males.

In the same year, Meisels and Guardo (1969) reported essentially the same phenomenon in a sample of children in the third through tenth grade. In this study, the target silhouette was described as either a friend, acquaintance, stranger, or a liked, neutral, disliked, or feared person. Again, sex differences in responses to different social situations emerged in that females placed the manipulable figures representing themselves farther from the targets than did males within all of the neutral or negative conditions, except within the "acquaintance" condition. Meisel and Guardo's study also provided further support for the notion that pre-pubescent children prefer closer interfigure distances for same sex figures than opposite sex figures, while post-pubescent children prefer closer interfigure distances for opposite sex figures than for same sex figures. Within the acquaintance, stranger, and neutral conditions, children from the third through sixth grades placed same sex figures closer together than opposite sex figures, while children from the seventh through tenth grades placed opposite sex figures closer together than same sex figures.

Subsequent approach simulation research by Guardo has suggested that there are sex differences in the way people view certain personality traits and that these differences are reflected in interfigure distance choices. In 1976, Guardo conducted a study in which she asked fifty sixth grade children to place a self figure in relation to a same sex peer figure under fourteen situations. In the situations, different personality traits were attributed to the peer figures. Examples of the peer descriptions presented to the children are:

"This is someone who is always slow about doing things." (phlegmatic)

"This is someone who is always trying to get out of things and doesn't follow the rules." (expedient)

"This is someone who gets upset easily and is touchy about things." (affected by feelings)

"This is someone who worries a lot and is afraid of things." (apprehensive)

Results from the study indicated that females positioned the self figure farther from the target figure than males did when the target figure was described as vigorous, assertive, and phlegmatic, while males placed the self figure farther from the target figure than females did when the target figure was described as tender-minded, affected by feelings, apprehensive, and expedient. Guardo suggested that these sex differences in the degree of negativity associated with different personality traits were based on a recognition of sex appropriate behaviors. However, why females responded more negatively to phlegmatic same sex peers than did males, and why males

responded more negatively to expedient same sex peers than did females remains unclear.

Lerner, Venning, and Knapp (1975) examined the effects of the sex and the physical build of figures on approach distancing preferences. In their approach simulation study, children from the fourth, fifth, and sixth grades were instructed to place a self figure in relation to a target figure. The sex (male or female) and the physical build (ectomorphic, mesomorphic, or endomorphic) of the target figure were varied. The data from the study yielded further empirical support for the notion that pre-pubescent children prefer closer approach distances to others of the same sex than to others of the opposite sex. Female subjects placed self figures at an average distance of 15.3 centimeters from male target figures and at an average distance of 7.5 centimeters from female figures. Similarly, males placed self figures at an average distance of 14.3 centimeters from female target figures, compared to an average distance of only 7.9 centimeters from male target figures. Male and female subjects responded similarly to the manipulations of the target figure's physical build; children of both sexes placed the self figure farther from endomorphic figures than from ectomorphic or mesomorphic figures.

Simulation studies considering the effects of the sex of the figures on interfigure distances have not unanimously supported the notion that pre-pubescent children prefer closer interfigure distances for same sex figures than for opposite sex figures, while older subjects prefer closer distances for opposite sex figures than for same sex figures. Three simulation studies have reported an absence of differences in figure placement due to the sex of the figures.

One of the studies which reported such an absence of sex effects was conducted by Bass and Weinstein in 1971. In this study, children were instructed to place self figures in relation to target figures that were pre-drawn on backgrounds representing two types of settings. The background settings represented either a principal's office (with a desk), or a living room (with a chair and lamp). While the five to nine year old sample showed age effects (older children used larger distances), setting effects (closer distances appeared in principal's office), and acquaintance effects (the self was placed closer to friends than strangers), no significant sex differences were found. The absence of effects for sex led the researchers to conclude that "sex is probably not a relevant variable at early ages (five through nine)" (p. 373).

Duke and Nowicki (1972) also reported an absence of sex differences in figure placement. In their research, they employed a modification of the figure placement technique in which the space is viewed from above rather than from a head-on perspective. In their technique, the "self" or "other" figure is represented as a small circle from which eight radii emanate indicating various angles of approach (side, rear, etc.) and manipulable figures are placed in relation to the preplaced circle. The researchers described several studies they had conducted employing this instrument. In one of the studies described in the paper, they reported a decrease in approach distances toward figures of the opposite sex at the onset of puberty, a phenomenon also reported by Meisels and Guardo (1969) and Koslin, et al. (1971). However, in another study reported in the same paper,

undergraduates were presented situations which differed with respect to the authority of the approacher, the locus of control of the subject, and the sex composition of the dyad. While there were main effects for authority of approacher (those of greater authority were kept at greater distances) and for locus of control (externals preferred greater interfigure distances than internals), the sex of the figures had no effect on the approach distances chosen by the subjects.

Finally, Edwards (1977) also reported that the sex of the figures had no effect on interfigure distances. Edwards employed a three dimensional simulation technique which involved the placement of gray dolls in his research on the approach distance preferences of undergraduate students. In this case, the target doll was described as the self and was pre-placed. The subjects were instructed to place another manipulable doll at a comfortable distance for a conversation. In what he termed as a "surprising" result of the study, the sex attributed to the "other" doll had no effect on chosen approach distances.

Summary. While it is clear that a large variety of specific issues have been examined by simulation studies, two patterns of sex differences in interpersonal distancing preferences have emerged from this review. First, as Table II-2 illustrates, a number of investigations have indicated that there are sex differences in the way subjects respond to different kinds of social situations. Specifically, studies in this area have suggested that females prefer greater interfigure distances than males when the social situation is negatively toned. The second behavioral trend revealed

TABLE II-2

SUMMARY OF SIMULATION RESEARCH ON SEX DIFFERENCES IN INTERPERSONAL DISTANCING BEHAVIOR

Study (type of distancing behavior investigated)	Females placed figures farther apart than did males when the social situation was described as negatively toned	Prepubescent children placed same sex figures closer together than opposite sex figures while adolescents and adults placed opposite sex figures closer together than same sex figures
Bass and Weinstein, 1971 (approach)	..	0
Dosey and Meisels, 1969 (approach)	+	..
Duke and Nowicki, 1972 (approach)	..	+, 0
Edwards, 1977 (approach)	..	0
Guardo, 1969 (approach)	+	..
Koslin, et al., 1971 (approach and dyadic)	..	+
Kuethe and Stricker, 1963 (dyadic)	..	+
Lerner, et al., 1975 (approach)	..	+

TABLE II-2 (Continued)

Study (type of distancing behavior investigated)	Females placed figures farther apart than did males when the social situation was described as negatively toned	Prepubescent children placed same sex figures closer together than opposite sex figures while adolescents and adults placed opposite sex figures closer together than same sex figures
Little, 1968 (dyadic)	..	..
Meisels and Guardo, 1969 (approach)	+	+
Melson, 1976 (dyadic)	+	..

+ Relationship appeared to a significant degree.

0 Relationship did not appear to a significant degree.

.. Effect was not under investigation.

by this review is that young children generally place same sex figures closer together than mixed sex figures while adolescents and adults place mixed sex figures at closer distances than same sex figures.

Field Investigations of Sex Differences in Interpersonal Distancing Behavior

Field research on sex differences in interpersonal distancing behavior has focused primarily on four different issues. First, the approach distancing preferences of males and females have been studied in the field. Secondly, researchers have conducted field experiments in which male and female subjects are invaded by confederates, allowing for the observation of sex differences in reactions to intrusion. Thirdly, factors influencing the willingness of males and females to invade others have been investigated in the field. Here, the confederates are stationary, but somehow "in the way" of others, thus setting the stage for the examination of individuals' attempts to avoid invading others. Finally, purely observational studies have been conducted on sex differences in interpersonal distancing behavior. In these studies, there are no manipulations by the researcher, just the recording of dyadic interpersonal distancing behaviors as they naturally occur.

The following review of field research on sex differences in interpersonal distancing preferences is organized on the basis of these four major areas of concern. That is, the results from field research on sex differences in approach distancing preferences are discussed first. Secondly, there is a review of the research which has focused on male and female subjects' reactions to spatial invasion.

Thirdly, studies of the willingness of males and females to invade others are discussed. Finally, the results from purely observational studies are reviewed.

This review of field research on interpersonal distancing preferences will reveal three major sex difference patterns. First, it will be seen that results from field studies have dovetailed those from laboratory studies in indicating that others prefer closer approach distances to females than to males. Secondly, the field studies cited in this section will suggest that people are more willing to invade females than males. Finally, this review will provide further empirical evidence that female dyads tend to prefer closer dyadic distances than male dyads.

Field investigations of approach distancing preferences. Three of the field investigations reviewed by this author examined sex differences in approach distancing behavior. Two of these studies reported that others approached females at closer distances than they approached males. The third study reported an absence of differences in approach distancing behavior due to dyadic sex composition.

One of the field investigations which did report sex differences in approach distancing behavior was conducted by Willis in 1966. He investigated the effects of sex and social relationship on the approach distancing behavior of 775 subject-confederate pairs of adults in homes, business offices, and university halls. The results from the study indicated that female confederates were approached at significantly closer distances than males, regardless of setting or the sex of the approacher.

Lomranz, Shapira, Coresh, and Gilat (1975) also found that others approach females more closely than males. They investigated sex differences in the approach distancing behavior of children between the ages of three and seven years. In the study, the researchers created situations in the field in which one child had to approach another child seated on a bench. The results from the study revealed that the sex of the approaching child did not significantly affect the approach distances, but that the sex of the child being approached did significantly affect the approach distances. Children of both sexes approached females at significantly closer distances than they approached males.

While Willis (1966) and Lomranz, et al. (1975) found sex differences in approach distancing behavior, Powell and Dabbs (1976) did not. They performed a two part study which considered the effects of sex and physical attractiveness on approach distances. In the first phase of the study, which was conducted in the laboratory, subjects were instructed to approach life-sized posters of the busts of attractive and unattractive men and women. Females approached posters of attractive men and women at closer distances than they approached posters of unattractive people. Males approached posters of attractive women at significantly closer distances than they approached posters of unattractive women, and did not discriminate on the basis of attractiveness in posters of men. The researchers expected to find these same spatial phenomena in the field. Thus, in the second phase of the study, attractive and unattractive male and female confederates interviewed passersby on a sidewalk. Rooftop photographs of the dyads revealed that, contrary to the researchers'

predictions, there were no significant differences in approach distances due to either the sex composition of the dyad or the attractiveness of the confederates.

Field investigations of reactions to spatial invasion. Invasion research is characterized by active (as opposed to stationary) confederates who deliberately position themselves close to subjects, thus allowing for the observation of subjects' reactions to spatial invasion. Studies hailing back to the classic work of Felipe and Sommer (1967) have rather consistently shown that people do react to invasion either by fleeing or by engaging in such behaviors as blocking, leaning away, etc. Field invasion studies have demonstrated that there are sex differences in reactions to invasions, but that the specific ways in which these sex differences manifest themselves are dependent on the particular circumstances under which the invasion occurs.

Information on sex differences in reactions to invasion is provided by such work as that of Patterson, Mullens, and Romano (1971). In their study, two female confederates invaded forty male and forty female undergraduates sitting alone at eight seat library tables. The confederates positioned themselves either adjacent to, two seats away adjacent to, three seats away adjacent to, or across from the target subject. An observer recorded latency of flight, glances, leaning, and blocking behaviors. The dependent variable of flight latency showed no sensitivity to degree of spatial immediacy or dyadic sex combination; only eighteen of the eighty subjects departed within the ten minute observation period. But of those who did flee,

those in the most immediate invasion conditions did so faster. The other significant findings were that females displayed more blocking behaviors (turning away, hiding the side of the face with the hand, etc.) in the adjacent invasion conditions, compared to males who engaged in these behaviors significantly more in the across conditions.

In a more recent study employing the same methodology, Polit and LaFrance (1977) had male and female confederates invade 120 students seated at library tables. They added a "saliency" variable in which half of the intrusions were made more obvious by having the confederates ask, "Is this seat taken?". In contrast to the Patterson et al. study, the Polit and LaFrance study did report sex differences in flight reactions. Females fled significantly faster than males, especially in the saliency conditions. It is also noteworthy that Polit and LaFrance employed both male and female confederates, in contrast to the Patterson study which only employed female invaders, only to find that sex of invader had no effect on the subjects' reactions to the invasions.

Up to this point, only field studies involving the invasion of stationary people have been cited. There have also been investigations involving the invasion of ambulatory subjects. One of these studies was performed by Sobel and Lillith in 1975. They instructed male and female confederates to walk head on into individuals walking on a sidewalk. They recorded the point at which the subjects first deflected from their paths in order to avoid the confederate, as well as the distance between the subject and the confederate at the point of passing one another. This piece of research yielded two

interesting findings. First, male confederates were given significantly less frontal space than females; subjects deflected from their paths at an average distance of 56 inches from the female confederate compared to 37 inches from the male confederate. The second noteworthy finding was that of the 40 percent of the trials which resulted in the brushing of shoulders when passing one another, male confederates were brushed significantly more often than female confederates. These results are inconsistent with much of the research on sex differences in proxemic behaviors which indicates that interpersonal distances tend to be less when there is a female involved (e.g., Leibman, 1970; Lomranz, et al., 1975; Willis, 1966). Recognizing the incompatibility of their results with much of the literature, Sobel and Lillith suggested that perhaps spatial norms are different in ambulatory situations.

Another field investigation of sex differences in ambulatory subjects' reactions to invasion was conducted by Knowles in 1973. This study entailed the frontal invasion of dyads walking on a sidewalk. The research was undertaken in order to investigate the permeability of dyads of different sex compositions. Male research assistants walked head on into male-male, female-female, and male-female pairs of people ambulating on a sidewalk. The spatial response of the dyad to the invasion (splitting or moving to one side as a unit) was recorded. Results of the study showed resounding effects for the sex composition of the dyad. Thirty-three percent of the male dyads moved out of the way of the approaching confederate as a unit; 62 percent of the female pairs moved to one side as a unit, and 83 percent of the mixed sex dyads resisted splitting by sidestepping

the invader together. However, inasmuch as the interpersonal distances of the dyads previous to invasion was not noted by Knowles, it remains an open question as to whether the sex composition of the dyad was the basis for the differential permeability or whether the effect observed was in fact due to how close the dyad members were to one another when invaded. That is, Knowles' data may have been an artifact of the interpersonal distancing preferences of male, female, and mixed sex dyads, and not simply a function of dyadic sex composition. For example, it may be the case that a male dyad ambulating at a close interpersonal distance is just as impervious to invasion as a mixed sex dyad ambulating at the same interpersonal distance.

Field investigations of people's willingness to invade others. An interesting method of studying proxemic behavior in the field is to consider people's reluctance to invade others, i.e. their recognition of others' personal space. This genre of inquiry involves the observation of individuals' spatial responses to the presence of stationary confederates. Research in this area has shown that people do indeed respond to the presence of such stationary confederates. For example, Cheyne and Efran (1972) conducted a field study in which either two interacting individuals, or two trashcans (in the control condition), were positioned in a university hallway. While subjects were willing to walk between the trashcans, there was a significant avoidance of walking between two interactants.

Field research of the effects of sex on people's willingness to invade others has indicated that people are more willing to invade females than males.

One field study which reported such differential reactions to male and female stationary confederates was conducted by Dabbs and Stokes in 1975. They examined the reactions of passersby to one male, one female, a male pair, or a mixed sex pair of confederates standing on the edge of a public sidewalk. There were no main effects for the sex of the subject, but the sex and number of confederates present did elicit differential responses. People kept farther away from a male than a female confederate and passed two confederates at greater distances than one. Leibman (1970) also reported data indicating that people are more willing to invade females than males. She devised a field situation in which adult female subjects had to choose between invading either a male or female confederate seated on three foot long benches. Subjects invaded the female confederates more and sat closer to females when they were chosen over males.

Similar effects for sex of confederate were reported by Buchanan, Juhnke, and Goldman (1976). In this study, confederates were positioned by elevator floor designator panels. Specifically, the researchers created three different situations. In the first two situations, either a male or a female confederate stood at one of the two panels in the elevator. In these conditions it was possible for subjects to avoid invasion by choosing to use the vacant panel. In the third situation, there were two confederates (one male and one female) in the elevator, forcing the subjects to make an invasion choice. Pooled data indicated that subjects preferred to avoid invasion when possible. If only one panel was occupied, and by a male confederate, both male and female subjects tended to choose the vacant panel. Females, however,

did not seem to mind violating the personal space of a female confederate, even when it was possible to choose an unoccupied panel. When the subjects were forced to choose between invading a male or female confederate, male subjects violated the personal space of females more often, compared to female subjects who showed no preference.

However, as with much of the research in proxemic sex differences, findings regarding effects of confederate sex on avoidance of invasion have not been consistent. In conflict with the results of the above three studies are the data obtained by Barefoot et al. in 1977. In this field study, male and female confederates positioned themselves next to a water fountain in a public hallway. In this case, male subjects invaded male confederates significantly more often than they invaded female confederates in order to drink from the fountain.

Field investigations of dyadic distancing preferences. The fourth and final category of field research on sex differences in interpersonal distancing behavior involves the unobtrusive observation of dyadic distancing preferences. This methodology is characterized by the recording of dyadic distancing behavior as it naturally occurs without manipulation. It is surprising that this ethological approach to investigating interpersonal distancing behavior has been utilized only recently and still rather infrequently in spite of the urgings of such pioneer proxemic researchers as Hall (e.g., 1968) and Sommer (e.g., 1969). Observational studies of sex differences in interpersonal distancing preferences have generally indicated that female dyads prefer closer interpersonal distances than male dyads.

One of the first purely observational studies which considered sex differences in interpersonal distancing behavior was conducted by Baxter in 1970. This investigation, which also examined the influence of age and cultural factors on proxemic behavior, was executed within the setting of a zoo. As dyads stood looking at animal exhibits, an observer recorded their interpersonal distances. The orientations and eye behavior of the subjects were naturally constant as they all stood side by side observing the animals. Baxter reported that the interpersonal distancing behavior of young Anglo-Saxon children (between the ages of five and ten years) was not significantly affected by dyadic sex composition. However, the interpersonal distancing behavior of Anglo-Saxon adolescents and adults was significantly affected by the sex composition of the dyad. Male-female dyads stood closest to one another, followed by female-female dyads, and male-male dyads adopted the largest interpersonal distances. However, Baxter pointed out that even though he obtained significant differences in distancing due to dyadic sex composition, sex factors accounted for only a small proportion of the variance in the interpersonal distances observed.

Aeillo and Jones (1971) also examined sex differences in naturally occurring dyadic distancing behavior. They unobtrusively observed the interpersonal distances assumed by children six to eight years old during lunch and recess periods. Results from the study indicated that White male dyads preferred greater interpersonal distances during social interactions than White female dyads.

The only exception to the sex difference pattern of female dyads preferring closer interpersonal distances than male dyads is

seen in a field study conducted by Jones in 1971. He unobtrusively observed the interpersonal distances assumed by dyads of adults interacting on New York City streets. He reported no sex differences in interpersonal distancing preferences; 80 percent of all dyads observed interacted at distances between one and a half and two and a half feet.

Summary. Table II-3 presents a summary of the findings on sex differences in distancing behavior that have been reported by field investigations. It is apparent that, although there have been contradictory findings reported, most field investigations have suggested that interpersonal distances are generally smaller when there is a female involved. Specifically, three themes in sex differences have emerged from this review. First, approach distancing studies have indicated that others approach females more closely than they approach males. Secondly, studies examining people's willingness to invade others have shown that people are more willing to invade females than males. Thirdly, dyadic distancing studies have suggested that female dyads prefer closer interpersonal distances than male dyads.

Finally, it should be noted that field investigations of people's reactions to invasion have also reported significant sex differences. However, the ways in which these sex differences manifest themselves seem to be rather variable and dependent on the specific conditions under which the invasions occur.

TABLE II-3

SUMMARY OF FIELD RESEARCH ON SEX DIFFERENCES IN INTERPERSONAL DISTANCING BEHAVIOR

Study	Others preferred closer approach distances to females than to males	Females were invaded more often than males	Dyadic distances were smaller for female dyads than for male dyads
Aeillo and Jones, 1971	..	..	+
Barefoot, et al., 1977	..	-	..
Baxter, 1970	..	..	+
Buchanan, et al., 1976	..	+	..
Dabbs and Stokes, 1975	..	+	..
Jones, 1971	..	..	0
Leibman, 1970	+	+	..
Lomranz, et al., 1975	+	..	..
Powell and Dabbs, 1976	0	..	..
Sobel and Lillith, 1975	-	..	..
Willis, 1966	+	..	..

+ Effect appeared to a significant degree.

- Opposite effect appeared to a significant degree.

0 No sex differences appeared.

.. Effect was not under investigation.

Conclusions

This review of investigations concerning interpersonal distancing behavior has revealed three sex difference patterns pertinent to the present research. First, studies in this area have suggested that others tend to approach females more closely than they approach males. Secondly, several investigations reviewed in this chapter have reported that interpersonal distances tend to be smaller for female dyads than for male dyads. Finally, interpersonal distancing research has indicated that adult mixed sex dyads prefer close interpersonal distances than adult same sex dyads.

Although a relatively large number of investigations have examined sex differences in interpersonal distancing behavior, there are still gaps in the literature. First, in most of the studies cited in this chapter, only one interpersonal distance measure was taken for each dyad; typically the distance recorded was the approach distance. There is a distinct need for research that recognizes that approach distances, in which the approacher alone establishes the interpersonal distance, are conceptually different from dyadic distances, in which both members coact to determine the interpersonal distance. That is, more research is needed concerning dyadic distancing behavior, especially in terms of how it may change over the course of social interactions.

Secondly, this review has illustrated that the effects of dyadic sex composition on distancing behavior deserve further attention. While a number of studies have compared the distancing preferences of male and female dyads, and a number of studies have

compared the distancing preferences of mixed sex and same sex dyads, there is a dearth of research considering the distancing preferences of male, female, and mixed sex dyads simultaneously.

The present research is addressed to these two neglected aspects of the literature on interpersonal distancing behavior. That is, in the present research, the dyadic distancing behavior of male, female, and mixed sex dyads is unobtrusively recorded, at ten second intervals, throughout the duration of their social interactions.

CHAPTER III

VISUAL BEHAVIOR DURING SOCIAL INTERACTION

A major purpose of the present research is to investigate the dynamics of proxemic behaviors as they naturally occur during social interaction. Inasmuch as visual behavior is a vital component of the proxemic behavior system, it is appropriate to review the current state of the knowledge concerning this behavior. That is, in order to fully appreciate the role eye behavior plays during social interaction, it is necessary to be aware of the variables which can influence when and how much people look at each other.

The following discussion of visual behavior during social interaction is divided into four sections. The first section is devoted to a discussion of the various terms that have been employed by researchers to describe visual behavior. The second section examines the social and situational factors which can affect looking behavior during interactions. The third section focuses on sex differences in visual behavior. This section includes a review of the literature concerning the effects of dyadic sex composition on visual behavior. The studies cited here are especially important because they provide the foundation for several hypotheses within the present dissertation research. Sex differences in responses to factors influencing visual behavior are also included in this section. The chapter concludes with general comments about the current state of the literature on visual behavior, citing those gaps in knowledge that are addressed by the present research.

Terminology

Before examining the situational and social factors which influence visual behavior, it is appropriate to discuss the various terms used by researchers to describe this phenomenon. As Exline (1965) and Knapp (1972) have both pointed out, a number of different terms have been employed by behavioral scientists to describe visual behavior during social interaction. One of the earlier and more common labels for visual behavior has been that of "eye contact." Argyle and Dean (1965) and Mehrabian (1968a and b) are among those who have described visual interaction in this way. However, due to its misuse, this term has, in some cases, precipitated confusion. Often, in describing subject-cofederate situations, researchers have spoken of how subjects engaged in more or less eye contact as a function of some manipulation. But clearly, a person cannot engage in eye contact without a cooperative coactor. Illustrations of how the term eye contact has been misused is seen in some of Mehrabian's earlier investigations of visual behavior. For example, in his study of the effects of status and sex on proxemic behavior (1968a), he asked subjects to sit down facing an empty chair and pretend that they were interacting with an imaginary person. In reporting his findings, he used the term eye contact to describe the visual behavior of the subjects.

Many researchers have recognized that the term eye contact can describe the reciprocal visual behavior of two interactants, but not other behavioral situations, and have consequently revamped their terminology. For example, in more recent studies by Argyle (e.g. Argyle and Ingham, 1972), eye behavior is discussed in terms of gaze

and mutual gaze. "Line of regard" is the terminology preferred by Lambert and Lambert (1965) to describe interactants' direction of looking. These expressions are equivalent to "gaze direction" and are an improvement over the term "eye contact" because they allow the researcher to describe all possible visual interaction situations: those cases when A is looking at B while B is looking elsewhere (or vice versa), as well as those cases in which A and B are looking at each other simultaneously (instances of mutual line of regard or mutual gaze).

Facial regard, another term often employed to describe visual behavior, also allows for the description of all possible combinations of visual interaction. However, this term does not distinguish between looking at the eyes and looking at some other part of the face. It is interesting to note that there is something of a controversy brewing with regard to whether facial regard <u>can</u> be reliably distinguished from eye contact. In a frequently cited work, Gibson and Pick (1963) reported that people do accurately discriminate between when people are looking directly into their eyes and when they are not. But more recent work by Stephenson and Rutter (1970) raises doubts about whether people can accurately make these distinctions. They had <u>untrained</u> observers note the eye behavior of confederates at two, six, and ten feet. At the greater distances, observers incorrectly judged others to be looking at their eyes when, in fact, they were gazing at their ears or shoulders.

It is the preference of this author to speak about specific types of visual behavior in terms of the expressions "gaze direction" and "line of regard" because these terms best allow for the exact

description of all possible combinations of eye behaviors within an interacting dyad.

Factors Influencing Visual Behavior

In a theoretical article on the repertoire of nonverbal behavior (1969), Ekman and Friesen wrote:

> While some people do not continually look at each other's faces, for to do so would be to start flirtations, power struggles or questions of suspicion or distrust, the face receives more attention from the other person than any other part of the body. . . . (p. 77)

What factors, then, control when and how much coactors look at one another during social interactions? Five categories of these determining factors have been empirically studied during the last fifteen years. These are the nature of the topic at hand, the social relationship between the interactants, individual differences, the point in the conversation, and the distance between the interactants.

The nature of the topic at hand. Research on visual behavior during social interaction has indicated that people typically look at one another less when they are discussing topics of an intimate nature. For example, Exline, Gray, and Schuette (1965) conducted a study in which confederates asked subjects very personal or innocuous questions. In the personal interview conditions, subjects were asked to discuss such topics as experiences which embarrassed them so much that they felt like "sinking into the floor" (p. 202). In the non-personal interviews, subjects discussed such innocuous subjects as their favorite sports. The visual interaction data from the study indicated that while the eye behavior during listening periods was not affected by the

experimental conditions, subjects of both sexes reacted to the intimacy of the topic by looking at the confederate significantly less while speaking in the personal interviews than in the non-personal interviews. This interview content effect was also apparent during the silent periods (when neither interactant was speaking), albeit not to a significant degree.

Social relationship. Eye behavior is also affected by the social relationship between the interactants. The general consensus here is that people tend to look at their coactors more when the relationship is positive than when it is not. One illustration of this association between liking and looking is provided by Exline and Winters (1965). In their study, each subject was asked to converse with two confederates simultaneously, and then to choose which confederate he/she liked better. Observation of the subjects' gaze direction revealed that they had looked at the preferred confederate significantly more than the non-preferred confederate.

Further confirmation of the notion that more positive social relationships are associated with more looking behavior is seen in the work of Efran and Broughton (1966). In this study, male undergraduate students were interviewed by same sex confederates. The experimental manipulation was that half of the subjects had friendly conversations with the confederates just prior to the interviews, while the other half did not. The eye behavior of the two groups was significantly different in that subjects who had had the pleasant conversations with confederates looked at them more than those who had not had such conversations with the confederates.

In related work by Ellsworth and Carlsmith (1968), the affective quality of interactions between subjects and confederates was varied by instructing confederates to tell the subjects that they had been judged as either very high or very low on intelligence and maturity. These manipulations resulted in significant differences in the amount of time subjects spent looking at the confederates; subjects looked at their confederate coactors significantly less under the aversive social conditions. The results from this study are congruent with an observation made by Goffman in Behavior in Public Places (1963) concerning eye behavior during aversively toned interactions. As an illustration of how tension within a dyad can cause avoidance of eye contact, he cites the reluctance of a soldier to look at an officer when he is being reprimanded.

The same association between positive social relationships and visual behavior during interaction has also been shown to hold up for children. Nancy Felipe Russo (1975) examined the effects of friendship on the eye behavior of twenty-four male and twenty-four female same sex dyads from kindergarten, and the third and sixth grades. She asked the dyads, composed of friends or non-friends, to engage in conversations while seated in chairs facing each other. Analysis of the visual behavior of the children indicated that while the percentage of time spent in eye contact did not differ significantly with friendship, the mean lengths of eye contact were significantly greater for friends than non-friends.

Most studies on the influence of social relationship on visual behavior have dichotomized the variable into either positive-negative, positive-neutral, or neutral-negative terms. Mehrabian (1968b) has looked

at the dimension of social relationship in finer terms. In his study, he asked subjects to pretend that they were in a seated interaction with someone who was either intensely disliked, moderately disliked, neutral, moderately liked, or intensely liked. The visual behavior data from the study showed that looking behavior was a parabolic function of liking. The least amount of looking occurred when the imagined addressee was intensely disliked, the greatest amount of looking occurred when the subject had neutral feelings for the addressee, and a moderate amount of looking occurred when the addressee was intensely liked. This pattern of visual behavior held up for both male and female subjects.

In addition to liking factors, perceptions of status also play a role in determining the social relationship between two interactants. Consequently, status has its own effects on visual behavior. Here again, the research findings have been rather consistent; people tend to look at high status addressees more than low status addressees. For example, Efran (1968) designed a laboratory study in which 122 male undergraduates interacted with two male confederates simultaneously. The confederates were either two seniors, two freshmen, or one senior and one freshman. The social status (year in college) of the addressees had a significant effect on eye behavior in that subjects in the presence of both a high status senior and a low status freshman consistently looked at the senior confederate more. Similar findings were reported by Mehrabian (1968a). In a study which included both male and female subjects, he found that both sexes looked at imaginary high status addressees more than imaginary low status addressees.

The parallel between the effects of status and the effects of looking on visual behavior goes further. In a study comparable to the liking study of Mehrabian (1968b), Hearn (1957) examined the influence of status on looking behavior in more specific terms. Rather than creating the customary conditions of high versus low status, he distinguished five levels of status and looked at their impact on visual behavior within dyads. He found the same type of parabolic function between status and looking that Mehrabian found between liking and looking. That is, subjects engaged in minimal amounts of looking behavior with very low status addressees, a maximum amount of looking with moderately high status addressees, and a moderate amount of looking with very high status addressees.

Individual differences. Several studies have related individual difference variables to differential visual behavior patterns. One genre of such individual differences which can affect visual behavior is personality abnormality. For example, in a study of the effects of autism on visual behavior, Hutt and Ounsted (1966) presented various figures to normal and autistic children. A major finding of the study was that the autistic children avoided looking at masks of human faces.

Non-pathological differences in personality can also influence visual behavior. In fact, it is interesting to note that one of the earliest investigations of visual behavior seen in the literature focused on such personality differences. In 1963, Exline performed a study comparing the eye behavior of subjects who were either high or low in need for affiliation. In competitive social situations, the two groups behaved similarly. However, in the non-competitive situations,

those who were high in need for affiliation engaged in significantly more mutual gaze with one another than those who were low in need for affiliation.

The degree to which a person is dependent on others is another type of individual difference which can have an impact on visual behavior. In order to examine the effects of dependency on visual interaction, Exline and Messick (1967) defined two subject groups according to their scores on the "control behavior" and "control wanted" subscales of W. C. Schultz's FIRO-B Personality Scale. Subjects scoring high or low on these dependency measures were then interviewed by confederates who gave them either high or low amounts of social reinforcement during the interactions. Not only did dependent subjects look at the confederate more than non-dependent subjects in the high reinforcement condition, they also looked more than non-dependent subjects in the low reinforcement condition.

Given that the personality variables of need for affiliation and dependency affect visual behavior, it is not surprising that social introversion/extraversion would similarly influence eye behavior. Mobbs (1968) compared the looking behavior of introverts and extraverts during three minute discussions with confederates. As hypothesized, the extraverts looked at their coactors more than introverts did. Of additional interest was a significant Spearman rank order correlation coefficient revealing that the greater the degree of extraversion, the longer the average duration of glances. Thus, at least with respect to the personality variable of social introversion/extraversion, eye

behavior is not only affected by extremes in individual differences, but is sensitive to gradations in the characteristic as well.

The point in the conversation. Kendon (1964), Exline et al. (1965), and Nielson (1972) are among the researchers who have reported that the point in the conversation has an influence on the probability that one person will be looking at the other at any given point in time. That is, listeners look at their coactors more than speakers do. Argyle and Dean (1965) stated that "there is more gaze when the subject is listening than when he is speaking, typically with a ratio of 2 ½ or 3:1" (p. 173). This relationship between listening and looking was noted by Goffman long before it was studied empirically. In 1957 Goffman wrote:

> If the individual is to become involved in a topic of conversation, then, as a listener, he will have to give his aural and usually his visual attention to the source of the communication, that is, to the speaker, and especially to the speaker's voice and face. This physical requirement is underlined by social rules that often define inattention to the speaker as an affront to him. (p. 52)

Kendon (1964), Day (1964), and Patterson (1973b) have suggested similar explanations for why listeners display greater amounts of looking behavior than speakers. They propose that visual interaction during conversations serves an information seeking function. Looking at the speaker allows the listener to gain as much information as possible about the communication through the "reading" of facial expressions and other non-verbal cues. At the same time, the listener is indicating to the speaker that he/she is attentive. Meanwhile, the speaker is generally looking at the listener relatively less due to a tendency to look away while transforming thoughts into sentences

in order to diminish distracting inputs from the listener's presence. The speaker will typically gaze at the listener at the end of utterances, partially in order to ascertain the listener's reaction to the communication.

Concurrently, the dynamics of gaze direction serve another purpose within the conversation--that of synchronizing speech transitions (Kendon, 1964; Patterson, 1973). The part visual interaction plays in the smooth exchange of speaking-listening roles takes a very predictable form. As person A concludes an utterance, he looks at B and continues to do so as B begins speaking. At the same time, B will tend to look away at the beginning of his/her utterance in order to formulate the ensuing communication with minimal distraction. Kendon (1964) has found that when this visual behavior pattern is absent, there is a disruption of the speaker-listener role transition causing significant delays in B's response to A. It is interesting to note here that speech transition synchrony may be effected through other nonverbal behaviors. DeLong (1974) has found that children offer the floor to their listeners through a leftward movement of the head accompanied by downward movements of the head or other parts of the body.

Interpersonal distance. A corollary of the immediacy system theory is that when the distance between two interactants increases, there is an increased amount of looking which serves to reduce the psychological distance between the two people. Conversely, when the two individuals are closer to one another spatially, there is a tendency for looking behavior to decrease. According to the Immediacy System

Theory, this interaction between distancing and eye behavior serves as a mechanism through which the coactors may achieve the desired degree of accessibility, or immediacy, with one another. The empirical evidence supporting the relationship between distancing and visual behavior is considerable. Among the researchers who have reported this inverse relationship between physical proximity and amount of looking are Argyle and Dean (1965), Argyle and Ingham (1972), Coutts and Schneider (1975), Goldberg, et al. (1969), Patterson and Sechrest (1970), and Watson and Graves (1966). The research on the impact of interpersonal distancing on visual behavior is discussed in depth in the Immediacy System chapter of this literature review.

Sex Differences in Visual Behavior

Perhaps the most salient sex difference in visual behavior is that females rather consistently look at their coactors more than males do, regardless of the sex of the other person. Such main effects for sex of subject were reported early in the history of visual interaction research. Exline, who was perhaps the foremost pioneer of this research area (having published papers on visual behavior as early as 1963) conducted a study in 1965 which provided early empirical evidence that females look at their coactors more than males do. In a collaborative effort with colleagues Gray and Schuette, Exline performed a study which has become a prototypic classic in the field. In their study, the visual behavior of male and female subjects was observed and recorded through a one-way mirror while they were being interviewed by a confederate who gazed at them steadily. During the interviews,

the undergraduate subjects were asked either very personal or innocuous questions. The researchers reported that male and female subjects responded similarly to the topic intimacy manipulations; both sexes of subjects looked at the confederate less while speaking during the personal interviews compared to the innocuous interviews. But of greater pertinence here was the finding that females looked at the interviewers significantly more than the males did regardless of the interview content and regardless of the sex of the interviewer. It was determined that this significant main effect for sex of subject was due largely to the fact that women engaged in much more looking while speaking than men did. That is, while sex differences in overall amounts of looking and in amounts of looking while speaking were significant, sex differences in looking behavior during listening periods were not. Libby (1970) obtained results dovetailing those reported by Exline et al. in a similar study which included sex of subject and topic intimacy as independent variables. That is, in his study as well, there was a significant main effect for sex of subject with females looking at their coactors significantly more than males regardless of the degree of intimacy of the interview content.

Exline and Winters also reported data "pointing to sex differences in the overall use of line of regard" (p. 347). Here again, females looked at their coactors more than males within interview situations. Specifically, undergraduate females looked at their interviewers 25 percent of the time during speaking periods, while men looked at their interviewers only 16 percent of the time during speaking periods.

Additionally, females looked at their interviewers 94 percent of the time while listening in contrast to males who looked 82 percent of the time.

This behavioral phenomenon of females looking at their coactors more than males, especially while speaking, seems to hold true for children as well. In a study by Ashear and Snortum (1971), a sample of ninety children from kindergarten and the second, fifth, and eighth grades were interviewed by a female undergraduate assistant. The researchers reported significant main effects for sex of subject such that females looked at the interviewer significantly more than males overall ($p < .024$), and while speaking ($p < .001$), but not while listening.

Up to this point, sex differences in visual behavior have been examined without consideration to the sex of the addressee. However, the sex composition of the interacting dyad also has an impact on visual behavior. Here the consensus is that same sex dyads look at each other more than mixed sex dyads, and that female dyads engage in more looking than male dyads. In an early study of visual behavior, Argyle and Dean (1965) observed the visual behavior of subjects during social interactions with confederates. All possible dyadic sex compositions were represented. Analysis of the subjects' visual behavior during the interactions revealed a strong sex of subject by sex of confederate interaction. The source of this highly significant interaction ($p < .001$) was that there was much more looking by the subject when the confederate was of the same sex as the subject than when the confederate was of the opposite sex.

Aeillo obtained similar results in 1972. In his study, the visual behavior of subjects was observed while they were interacting with male or female confederates. Again, the visual behavior data indicated that same sex dyads engaged in more looking behavior than mixed sex dyads, and female dyads engaged in more looking behavior than male dyads.

The same dyadic sex composition effects have been reported in unfocused dyads. The distinction between focused and unfocused dyads was first put forth by Goffman in 1963. Focused dyads are comprised of individuals involved in some kind of mutual activity; unfocused dyads are pairs of individuals in the presence of one another, but who are not socially involved with one another. Coutts and Schneider (1975) studied the visual behavior of unfocused dyads by having subjects, who were ostensibly involved in different experiments, wait for their experimenters while seated at opposite ends of a rectangular table. Observations of the visual behavior of the male, female, and mixed sex dyads revealed that female dyads engaged in more looking behavior than either male or mixed sex dyads.

At this juncture, it is appropriate to summarize the state of the literature on differences in visual behavior attributable to the sex of the interactants. As Table III-1 illustrates, three themes have emerged from the research in this area. First, there is considerable evidence that females look at their coactors more than males do, regardless of the sex of the coactor. Secondly, the research has indicated that members of same sex dyads tend to look at each other more than members of mixed sex dyads. Finally, studies comparing the eye behavior of male and female dyads suggest that pairs of females tend to look at each other more than pairs of males.

TABLE III-1

SUMMARY OF FINDINGS ON SEX DIFFERENCES IN VISUAL BEHAVIOR DURING INTERACTION

Study (Methodology)	Females Look at Coactors More Regardless of the Other's Sex	Same Sex Dyads Engage in More Looking than Mixed Sex Dyads	Female Dyads Engage in More Looking than Male Dyads
Aeillo, 1972 (laboratory)	..	+	+
Argyle and Dean, 1965 (laboratory)	..	+	..
Ashear and Snortum, 1971 (laboratory)	+	..	..
Coutts and Schneider, 1975 (laboratory)	..	+	+
Exline et al., 1965 (laboratory)	+	..	..
Exline and Winters, 1965 (laboratory)	+	..	..
Libby, 1970 (laboratory)	+	..	..

+ = Relationship was significant beyond .05 level. .. = Relationship was not under investigation.

These differential patterns of visual behavior due to dyadic sex composition are especially important because they form the foundation for predictions about the visual behavior of the interacting dyads in the second study of the present dissertation research. That is, on the basis of these studies, the visual behavior of interacting dyads would be expected to be influenced by sex such that a) males would look at male coactors more than they look at female coactors, b) females would look at female coactors more than they look at male coactors, c) females would look at female coactors more than males look at male coactors, and d) females would look at their coactors more than males, regardless of the sex of the coactor.

In addition to those studies which have examined differences in eye behavior due to the sex of the interactants, there have been studies conducted which have examined sex differences in responses to the factors influencing visual behavior. Specifically, sex differences have been reported in subjects' visual behavior responses to manipulations of social relationship, individual differences, and the distance between the interactants.

Mehrabian and Friar (1969) have reported sex differences in visual behavior responses to different social relationships. In their study, subjects were asked to imagine that they were in seated interactions with someone who was either liked or disliked and was of either high or low status. In male subjects there was significantly more looking with liked-high status addressees than with disliked-high status, liked-low status, or disliked-low status addressees. The amounts of looking in these latter three conditions were not

significantly different among themselves. Female subjects responded to the manipulations of social relationship differently. The only social relationship condition eliciting significantly different visual behavior from females was that of the disliked-low status addressee. Specifically, for females, there was significantly less looking in the disliked-low status addressee condition than in any of the other conditions. This finding that males show differential responses only to liked-high status addressees, while females show differential responses only to disliked-low status addressees reflects how complex sex differences in visual behavior may be.

Fromm and Beam (1974) conducted a study which investigated the effects of sex and the individual difference of dominance on visual interaction. From a sample of forty-eight potential subjects, sixteen male and sixteen female undergraduate subjects were put into high or low dominance groups based on their scores on the Bernreuter Personality Inventory. The subjects were then asked to approach to a comfortable distance a confederate who either looked at them continuously, or completely avoided eye contact. Among the dependent variables were the subjects' approach distances, approach rates, and eye behaviors. The results from the study indicated that male and female high dominant subjects chose closer distances to a confederate who stared at them while low dominant subjects of both sexes stayed further away from a staring confederate. Of greater interest here were the sex differences in male and female subjects' use of eye behavior to signal dominance. High dominant women used eye behavior to signal their dominance over their coactors; they looked at the staring confederates more than did

high and low dominant males and low dominant females. High dominant male subjects did not convey their dominance over their coactors through visual behavior. Instead, they nonverbally communicated their dominance through closer approach distances and more rapid approach rates.

Finally, visual behavior responses to manipulations in the distance between interactants have been shown to be affected by sex differences. In a study of the effects of interpersonal distancing on eye behavior, Aeillo (1972) observed the visual behavior of undergraduate subjects sitting either two, six, or ten feet away from confederate coactors. It was hypothesized that as the distance between the interactants increased, the amount of looking by the subjects would also increase. This linear relationship between interpersonal distance and amount of looking held up for the fifty-one male subjects in the study. However, the visual behavior of the fifty-four females did not support the hypothesis. While the mean amount of looking and the mean length of glances by female subjects did increase from the two to six foot condition, at ten feet, females showed a severe drop in both of these visual behavior measures. In fact, female subjects looked at their coactors less at ten feet than they did at two feet. Aeillo suggested that this phenomenon may have been due to a "differential upper boundary between the sexes for . . . distance effects on . . . visual interaction" (p. 336). Apparently, there are such sex differences in the upper limits of interpersonal distances which can cause increases in looking behavior. In subsequent research, Aeillo (1977) found that female subjects' looking behavior ceased to increase with interpersonal

distance beyond distances of seven feet. Male subjects, on the other hand, continued to increase their looking behavior as interpersonal distance increased up to distances of fourteen and a half feet.

These few studies of sex differences in responses to the factors influencing visual behavior pique one's curiosity about other possible sex differences in reaction to these variables. It is clear that more research is required in this area to delineate how sex effects can interact with these social and situational factors to create unique combinations of visual behavior patterns. Perhaps, in the next decade, more attention will be given to these issues.

Conclusions

In summarizing the research on visual behavior presented in this chapter, it is appropriate to quote Duncan's 1969 review article on nonverbal behavior:

> Considered together, the studies of visual interaction demonstrate a remarkable consistency of findings. Despite the newness of the area, there is virtually none of the confusion of conflicting results or failures of replication so often encountered in psychological literature. Instead, the typical case with visual interaction has been mutual verification and expansion of results. (p. 336)

There has been an absence of contradictory findings in studies which have shown that visual behavior of interactants is affected by the nature of the topic at hand, the social relationship between the interactants, individual differences, the point in the conversation, interpersonal distancing, and sex differences.

However, the fact that research on visual behavior has been characterized by consistency in findings does not mean that more research

is not required in this area. For example, there is a general dearth of field research on sex differences in visual behavior. In fact, all of the studies reviewed in this chapter which reported sex differences in visual behavior were experiments conducted within laboratories. Consequently, there is a strong need for field studies on eye behavior patterns during naturally occurring social interactions to ensure that these sex differences occur with equal reliability in the "real world." A second problem with most of the research on visual behavior is that situational variables, such as setting, have not been given adequate, or even cursory attention. Hall, who forecast many nonverbal behavior models that have since been empirically verified (e.g. the multimodality of nonverbal communication and the distance zones for different types of social interaction) has discussed at length the probable effects of open, semi-fixed, and fixed feature spaces on proxemic behavior. Yet the effects of these types of settings on visual behavior remain unstudied. Thirdly, there is a need for further investigation of the functional relationships between visual behavior and other proxemic behaviors. Again, the problem here is that there is a need to return to the field to verify that those relationships seen in the laboratory are also operative in the field. For example, in Aeillo's two studies on the relationship between distancing and visual behavior, the interpersonal distances were manipulated, and only the eye behavior was allowed to vary. In interactions which occur naturally in the field, the interactants may choose both their distancing and visual behavior. By observing the interplay of these behaviors in the field, the natural dynamics of the functional relationships between the behaviors may be perceived.

These three gaps in the current state of knowledge concerning visual behavior represent major areas of inquiry within the present dissertation research. That is, in the present research, the effects of sex differences, setting differences, as well as the relationship among proxemic behaviors are considered during naturalistic observation of dyads engaging in social interaction.

CHAPTER IV

IMMEDIACY IN PROXEMIC BEHAVIOR

In the second study of the present research, the distancing, orientation, and visual behaviors of 240 individuals were unobtrusively observed as they engaged in social interactions. The purpose of the study was to examine naturally occurring proxemic behaviors from three main perspectives. First, the distancing, orientation, and visual behavior of the dyads were considered in terms of possible sex differences. Secondly, these behaviors were considered in terms of the type of settings in which they occurred. Finally, the proxemic behaviors were considered in terms of their functional relationships with one another. This chapter is devoted to a discussion of these functional relationships among distancing, orientation, and visual behavior in establishing desired levels of intimacy with others during social interaction.

In this chapter, the integral manner in which proxemic behaviors operate is examined in terms of the Immediacy System Theory. This theory delineates how different proxemic modes act in conjunction with one another to create desired degrees of psychological closeness with others during social interaction. The present discussion of the ability of the Immediacy System Theory to predict proxemic behavior is divided into five sections. The first section describes the Immediacy System Theory itself. The second section reviews the empirical support for the theory. Included here is a review of those studies which have

investigated the relationships between a) interpersonal distancing and visual behavior, b) interpersonal distancing and orientation, and c) orientation and visual behavior. The third section of the chapter examines the literature concerning orientation and interpersonal distancing factors in seating choices. In the fourth section of the chapter, sex differences in immediacy system behaviors are discussed. These sex differences are considered within the contexts of both standing and seated interactions inasmuch as the present research examines proxemic behavior within both of these types of situations. The chapter concludes with a discussion of how the present research contributes to the current state of the literature.

It is hoped that this material will provide insights about the potential of the Immediacy System Theory to predict proxemic behavior during dyadic social interaction as well as insights about how these behaviors may be affected by sex and setting differences.

The Immediacy System Theory

In 1965, Argyle and Dean proposed the affiliative conflict theory which functionally relates several nonverbal behaviors into a system through which people communicate their involvement with one another. The basic assumption behind the theory is that within any dyadic social interaction, each coactor is motivated by both approach and avoidance drives toward the other. The avoidance forces are based on a fear of revealing too much about the self and consequently being rejected about the other, while the approach forces are based mainly on "sheer affiliative needs" (p. 175). As a result of the interplay

between these opposing motivations, each interactant desires a certain degree of intimacy, or immediacy, with the other. When an equilibrium of these feelings is reached for a pair of interactants, it is behaviorally expressed largely through nonverbal means. That is, through the adoption of different interpersonal distances, orientations, postures, eye behaviors, etc., the interactants may achieve a level of immediacy which is satisfactory to both of them.

The dynamics of how these behaviors interrelate to establish and maintain satisfactory levels of intimacy between two interactants are delineated in the Immediacy System Theory. The behavioral predictions derived from this theory are based on the notion that once a satisfactory level of intimacy has been established between two interactants, they will strive to maintain this level of immediacy. Consequently, when the equilibrium level of intimacy is disrupted by a change in one of the operating immediacy behaviors, one or both of the interactants will attempt to reestablish the equilibrium through modifications in one or more of the other behavioral modes. For example, if one coactor moves "too close" to the other, a decrease in the amount of looking by one or both coactors is likely to occur as they try to reattain the desired amount of intimacy between them. Conversely, an increase in interpersonal distancing is expected to be associated with greater amounts of looking behavior on the part of one or both interactants.

The Immediacy System Theory of nonverbal communication has been an area of interest for a number of researchers. Argyle and Dean (1965) discussed the interrelationships among nonverbal immediacy behaviors in terms of the expressions "intimacy" and "equilibrium." Patterson (e.g. 1973b) has spoken of this phenomenon as a "compensation" system,

focusing primarily on individuals' compensatory reactions to disruptions in equilibrium. Mehrabian (e.g. 1968a, 1968b) also has discussed the interplay of various nonverbal behaviors during social interaction, labeling the operating behaviors "immediacy cues." Finally, it has been recognized that when Hall (1963) coined the term "proxemics" and delineated the behaviors involved in the proxemic system, he was describing much of what is involved in achieving desired levels of immediacy with others during dyadic social interaction. As Mehrabian wrote in 1967:

> The concept of immediacy, when it is adapted to nonverbal phenomena of communication, is analogous to the concept of "Proxemics." Hall, in introducing the concept of Proxemics, seems to have been motivated by an interest in charting the permissible ranges of Immediacy (e.g., in terms of orientation and distance) between individuals in different cultures, or for different social occasions within a given culture. (p. 325)

In fact, it was Hall (1963) who first identified distancing, orientation, visual behavior, touching, and voice loudness as interrelated components of this system of communication.

This section has provided an overview of the Immediacy System Theory and has mentioned some of the more prominent researchers of immediacy system phenomena. It is now appropriate to review the empirical support for the Immediacy System Theory which has accrued over the last fifteen years.

Empirical Support for the Immediacy System Theory

A number of studies concerning the Immediacy System Theory have been undertaken since the theory's initial empirical testing by Argyle and Dean in 1965. Most of these studies have focused on the interrelatedness of interpersonal distancing, orientation, and visual

behavior in establishing desired levels of immediacy with others. In order to study the interrelationships among these proxemic behaviors, researchers have typically chosen to isolate two of these behaviors and examine their functional relationships to one another. Thus, the preponderance of the literature in this area can be organized into three categories: studies investigating the relationship between interpersonal distancing and visual behavior, studies investigating the relationship between interpersonal distancing and shoulder orientation, and studies investigating the relationship between shoulder orientation and visual behavior.

The relationship between interpersonal distancing and visual behavior. Several studies have been conducted examining the relationship between interpersonal distancing and visual behavior in establishing various degrees of immediacy during social interaction. The Immediacy System Theory predicts that when the distance between two interactants is increased, the looking behavior of one or both interactants is likely to increase in order to reestablish the equilibrium level of intimacy between the coactors. There is a considerable amount of empirical support for this corollary of the Immediacy System Theory. This is largely due to the fact that this corollary of the theory has enjoyed more attention from researchers than any other. That is, a number of studies have indicated that within the contexts of both 90 degree and 0 degree orientations, looking behavior tends to increase as the distance between the interactants increases.

Investigations of the relationship between interpersonal distancing and visual behavior have generally employed one of two types of

methodologies. In the first type of methodology, the researcher manipulates the distance between the two interactants and examines the resultant changes in the amounts of looking behavior exhibited by the two coactors. In the second type of methodology, correlational analyses are imposed on subjects' interpersonal distancing and amounts of looking behavior as the subjects engage in social interactions within laboratory settings.

Investigations employing methodologies in which the researcher manipulates interpersonal distancing and observes the resultant visual behavior have rather consistently indicated that within both 0 degree and 90 degree orientational contexts, the looking behavior of coactors tends to increase as the distance between the coactors is increased. This phenomenon was first empirically demonstrated by Argyle and Dean in 1965. In their prototypic study, subjects sat in a 90 degree orientation to confederate coactors at distances of either two, six, or ten feet while discussing Thematic Apperception Test cards. Observation of the subjects' visual behavior under the distancing conditions revealed that both the total amount of looking and the average length of glances increased as the distance between the interactants increased. The greatest differences in visual behavior occurred between the two and six foot conditions; at two feet, the average length of glances was 5.5 seconds, increasing to 8.8 seconds at six feet, and 9.6 seconds at ten feet.

Argyle and Ingham (1972) employed a design similar to that of the Argyle and Dean study in their investigation of the effects of interpersonal distancing on visual behavior. They, however, used pairs of

genuine subjects and honed down their dependent measures to include the percent of time spent in mutual gaze and average length of mutual gaze, as well as the length of glances and total amount of looking. In the first part of their two part study, the orientation between the interactants was set at 90 degrees while the interpersonal distance was increased from two to ten feet. All four measures of visual behavior showed significant increases as a function of increased interpersonal distances. In the second part of the study, the orientation between the interactants was set at 0 degrees, and the interpersonal distances were increased from two to six feet. Under these conditions, only the total amount of looking and mutual looking increased as the interpersonal distance was increased; the lengths of glances and the lengths of mutual glances remained unaffected. Argyle and Ingham reported that the weaker effects of distancing in this case were expected and due to the smaller range of distancing manipulations imposed. But clearly, since they altered both the orientational context and the interpersonal distancing manipulations simultaneously, it is impossible to be certain that the observed effects were not partially due to the change from a right angle to a face to face orientational context.

Other investigations have reported data indicating that interpersonal distancing manipulations influence visual behavior within 0 degree orientational contexts. For example, Goldberg, Kiesler, and Collins (1969) conducted a study in which they recorded the visual behavior of male undergraduates seated facing confederate interviewers at distances of either two and a half or six feet. Analysis of the subjects' visual behavior within these two interpersonal distancing

conditions revealed that while the average overall percent of time spent in looking at the interviewer did increase significantly as distancing increased, the rate of glancing (number of glances per minute) was not significantly affected by the distancing manipulation. Coutts and Schneider (1975) also have reported finding that increased interpersonal distances are associated with greater amounts of looking behavior within 0 degree orientational contexts. In their study, pairs of subjects, each ostensibly waiting for a different experimenter, were seated at a table facing one another at interpersonal distances of either two or seven feet. For both males and females, overall amounts of looking, frequency of mutual glances, and duration of mutual gaze increased significantly when interpersonal distance was increased from two to seven feet. Russo (1975) has reported that children of both sexes also exhibit greater amounts of looking behavior when interpersonal distance is increased. In her investigation, she asked children between the ages of five and eleven to engage in interactions within head-on orientations at distances of either three and a half or six feet. Both boys and girls engaged in significantly more eye contact in the greater interpersonal distance conditions.

Aeillo (1972) gave more serious attention to the effects of orientation on the relationship between distancing and visual behavior. Employing a two by three design, he examined the visual behavior of subjects seated two, six, or ten feet away from confederates while in either a face to face or right angle orientation. The mean amount of looking and lengths of glances were the dependent measures. The results from the study showed that for males, both mean amount of looking and

length of glances increased linearly with distance, regardless of whether the orientation was set at 0 degrees or 90 degrees. Both dependent measures of looking also increased linearly for females seated at right angles from their coactors. However, for females interacting within 0 degree orientations, amount of looking was a parabolic function of distance. Aeillo reconfirmed this sex difference in the relationship between interpersonal distance and amounts of looking behavior in a subsequent study conducted in 1977. In this latter study, it was determined that females interacting within 0 degree orientations ceased to increase their looking behavior at interpersonal distances beyond seven feet. Males however, continued to look at their coactors more as distance increased up to distances of fourteen feet.

As was mentioned earlier, investigators of the relationship between distancing and visual behavior have also employed correlational methodologies. Additional support for the notion that increased interpersonal distances are generally associated with greater amounts of looking behavior is provided by the correlational studies of Watson and Graves (1966) and Patterson (1973a). In a study focusing on cultural differences in proxemic behavior, Watson and Graves observed several nonverbal behaviors of American and Arab dyads engaging in seated interactions. Greater interpersonal distances were significantly associated with increased levels of eye contact for American subjects ($r = .26$), but not for Arab subjects ($r = .04$). Similarly, Patterson, in his study of the stability of immediacy behaviors over two interviews, reported significant correlations of -.52 and -.38 between amount of eye contact and approach distance within the two interviews.

Table IV-1 summarizes the results from investigations of the relationship between interpersonal distancing and amounts of looking behavior. It is apparent that the support for the Immediacy System Theory's prediction that amounts of looking should increase as interpersonal distance increases is quite substantial. The only exception to this rule seems to be in the case of females interacting at 0 degree orientations; at distances beyond seven feet, their looking behavior ceases to increase as interpersonal distance increases.

The relationship between interpersonal distancing and orientation. The relationship between interpersonal distancing and orientation has also been studied by researchers interested in the Immediacy System Theory of nonverbal communication. Studies seeking empirical evidence for the theory's corollary that closer interpersonal distances should be associated with less direct orientations have generally been of a correlational nature. The data from these correlational studies have rather consistently supported the Immediacy System Theory. For example, Pellegrini and Empey (1970) conducted a study in which subjects freely placed their chairs in relation to a seated confederate with whom they were to interact. Observation of their distance and orientation choices revealed a significant negative correlation between approach distance and angle of approach such that closer distances were associated with less direct orientations. This relationship held up for both males ($r = -.45$, $p < .02$) and females ($r = .39$, $p < .05$).

Other researchers have employed the same chair placement type of methodology used by Pellegrini and Empey, and have found the same relationship between distancing and orientation. Patterson (1973a),

TABLE IV-1

SUMMARY OF STUDIES INVESTIGATING THE RELATIONSHIP BETWEEN INTERPERSONAL DISTANCING AND LOOKING BEHAVIOR

Study (Methodology)	Distancing Manipulations (in feet)	Orientational Context	Increased Distancing Associated with Increased Looking
Aeillo, 1972 (laboratory)	2, 6, 10	0°	+, -
	2, 6, 10	90°	+
Aeillo, 1977 (laboratory)	7.5 - 14.5	0°	+, -
Argyle and Dean, 1965 (laboratory)	2, 6, 10	90°	+
Argyle and Ingham, 1972 (laboratory)	2, 10	90°	+
	3, 6	0°	+
Coutts and Schneider, 1975 (laboratory)	2, 7	0°	+
Goldberg et al., 1969 (laboratory)	2.5, 6	0°	+
Patterson, 1973 (correlational-laboratory)	not set	not set	+

TABLE IV-1 (Continued)

Study (Methodology)	Distancing Manipulations (in feet)	Orientational Context	Increased Distancing Associated with Increased Looking
Russo, 1975 (laboratory)	2, 7	0^{o}	+
Watson and Graves, 1966 (correlational-laboratory)	not set	not set	+

+ Increased distancing associated with increased looking behavior.

- Increased distancing associated with decreased looking behavior.

in his study of the stability of immediacy behaviors across two interview sessions, reported significant negative correlations of -.44 and -.43 between approach distance and orientation for the two sessions. Watson and Graves (1966) found that greater proximity is associated with less direct orientation for both Americans ($r = -.51$) and Arabs ($r = -.33$). Finally, Patterson (1973b) cites a paper by G. L. Clore, which was presented to the Southwestern Psychological Association, Austin in 1969, as providing additional support for the relationship between distancing and orientation. In this study, subjects freely placed their chairs in relation to a mock subject's chair marked by a book and coat. Again, there was a significant correlation between distancing and orientation ($r = -.40$).

These studies, then, represent consistent support for the Immediacy System Theory's prediction that closer interpersonal distances should be associated with the adoption of less direct orientations.

The relationship between orientation and visual behavior. Results from investigations of the relationship between orientation and visual behavior have been less consistent. The Immediacy System Theory predicts that more direct orientations should be associated with decreased amounts of looking. But studies considering these behaviors have found both positive and negative relationships between shoulder orientation and looking behavior. Data supporting the Immediacy System Theory have been reported by Watson and Graves (1966) and Patterson (1973a). In the Watson and Graves study, there was a significant association between orientation and amounts of looking such that more direct orientations were correlated with less eye contact.

The same relationship between these proxemic behaviors was demonstrated in Patterson's two interview study; less direct orientations were associated with increased eye contact.

Other studies, however, have produced results directly contradicting those described above. In a study of subjects' proxemic behavior in relation to a hypothetical addressee, Mehrabian (1968b) reported finding a significant correlation of .51 between amount of eye contact and directness of orientation such that "the more the eye contact, the more direct the orientation" (p. 28). In another study conducted by Mehrabian in the same year (1968a), a comparable correlation of .41 was found between shoulder orientation and eye contact. Beach and Sokoloff (1974) have reported that this positive relationship between directness of orientation and eye behavior also holds up for children. Controlled observation of four and five year old children playing with blocks revealed that "looking at another child covaried with being physically oriented toward the other" (p. 1308). This relationship was significant for both sexes combined and for female subjects.

In light of these contradictory data, it becomes clear that the parameters of the functional relationship between orientation and visual behavior require further clarification. Indeed, it is a major purpose of this dissertation research to determine in what ways the physical environment and the sex composition of the interacting dyad may affect the relationship between orientation and visual behavior.

At this point, it is appropriate to summarize the empirical support for the Immediacy System Theory. First, as Table IV-2 illustrates, there is considerable support for the theory's corollary

TABLE IV-2

SUMMARY OF EMPIRICAL SUPPORT FOR THE IMMEDIACY SYSTEM THEORY

Study (Methodology)	Greater Distances Associated with More Looking	Greater Distances Associated with More Direct Orientations	More Direct Orientations Associated with Less Looking	More Direct Orientations Associated with More Looking
Aeillo, 1972 (laboratory)	+, -	..	..	..
Aeillo, 1977 (laboratory)	+, -	..	..	..
Argyle and Dean, 1965 (laboratory)	+	..	..	..
Argyle and Ingham, 1972 (laboratory)	+	..	..	..
Beach and Sokoloff, 1974 (laboratory)	..	..	..	+
Coutts and Schneider, 1975 (laboratory)	+	..	..	..
Goldberg, et al., 1969 (laboratory)	+	..	..	..

TABLE IV-2 (Continued)

Study (Methodology)	Greater Distances Associated with More Looking	Greater Distances Associated with More Direct Orientations	More Direct Orientations Associated with Less Looking	More Direct Orientations Associated with More Looking
Mehrabian, 1968a (laboratory)	..	..	..	+
Mehrabian, 1968b (laboratory)	..	..	..	+
Patterson, 1973a (laboratory)	+	+	+	..
Pellegrini and Empey, 1970 (laboratory)	..	+	..	..
Russo, 1975 (laboratory)	+	..	..	..
Watson and Graves, 1966 (laboratory)	+	+	+	..

+ Relationship appeared to a significant degree.

- Opposite relationship appeared to a significant degree.

..Relationship was not under investigation.

that greater distances should be associated with increased looking. Secondly, the table shows that the results from the three studies investigating the relationship between interpersonal distancing and orientation also have been supportive of the Immediacy System Theory. That is, all three studies reported a significant association between greater interpersonal distances and more direct orientations. Finally, the uncertainty about the relationship between orientation and visual behavior is reflected in the table. Two investigations have reported that more direct orientations were associated with less looking behavior, while three investigations have reported that more direct orientations were associated with more looking behavior.

Orientation and Interpersonal Distancing in Seating Choices

The literature on proxemic behavior indicates that both orientational factors and interpersonal distancing factors influence the seating choices of those intending to engage in social interaction. Inasmuch as the behavior of those dyads interacting within the semi-fixed feature space is likely to be affected by these factors, it is appropriate to review the current state of the knowledge concerning orientation and distancing preferences for seated interactions.

Orientation behavior in seating choices. A number of studies have demonstrated that orientation plays an important role in determining the seating choices of people who wish to interact with one another. In fact, rather consistent patterns in orientation behavior are exhibited by those intending to engage in social interaction. Specifically, people demonstrate an aversion to sitting side by side,

preferring instead to adopt right angle to head-on orientations toward their coactors. For example, in an observational study of the seating preferences of pairs of people in a library, Eastman and Harper (1971) found that dyads intending to interact exhibited a statistically significant aversion to sitting side by side. More dyads chose head-on orientations than 90 degree orientations, but there was no significant difference between the number of people choosing these two latter positions. Forston and Larson (1968) reported the same phenomenon in their study comparing the proxemic behavior of Latin Americans and North Americans. In this study, subject dyads were instructed to take chairs from a stack of chairs and place them however they chose for their ensuing problem solving session. Regardless of cultural background, all dyads seated themselves at orientations ranging from 0 degrees to 45 degrees.

Evidence that side by side orientations are not conducive to social interaction is provided also by Mehrabian and Diamond's 1971 investigation of the effects of furniture arrangement, props, and personality on social interaction. Independent variables in the study included manipulations of both the interpersonal distances and orientation between pairs of seated subjects left alone in a waiting room. The interpersonal distances were set at three, four and a half, six, or nine feet; the orientations were set at 0 degrees, 90 degrees, or 180 degrees. The dependent variable was the amount of affiliative behavior which was operationally defined as total statement rate plus positive verbal content plus verbal reinforcer rate minus latency of verbal reinforcement. Unobtrusive observation of these behaviors

within the twelve positioning conditions revealed that while there were no main effects for distancing on the amount of affiliative behavior, there was significantly less affiliative behavior when the subjects were positioned in side by side orientations. These results dovetail with Hearn's earlier finding (1957) that when leaderless groups of people engage in discussions while seated around a table, speakers tend to address others across from them while avoiding addressing those seated adjacent to them. Hearn dubbed this phenomenon the "Steinzor Effect" because Steinzor (1950) had previously found that within seated groups, someone opposite from a speaker was significantly more likely to be the next speaker.

The interplay of interpersonal distancing and orientation in seating choices. Sommer (1959, 1962) and DeLong (1977a, 1977b) are among those who have examined the specifics of the interplay between distancing and orientation in seating choices for social interaction. In 1959, Sommer conducted a study on distances for comfortable conversations. He varied the distance between two fifty inch long couches which were facing each other, and observed where pairs of subjects sat to have a conversation. When the couches were less than three and a half feet apart, subjects chose to sit facing each other on different couches. However, beyond this distance, subjects sat side by side on the same couch. Sommer recognized that while the face to face distances between subjects were reasonably well controlled by how the couches were positioned, the side to side distances between subjects were not well controlled. That is, those subjects who chose side by side orientations were necessarily together on the same couch;

thus they could create any interpersonal distance they chose up to a ceiling of fifty inches (the length of the couch). In order to correct the limitations of his 1959 study, Sommer conducted a subsequent study in 1962 which employed, instead of two couches, four chairs positioned so that one pair of chairs faced the other. By using chairs instead of couches, Sommer was able to control and manipulate side by side distances as well face to face distances. Consequently, it became possible to incorporate the effects of side by side distancing options on subjects' seating choices within a semi-fixed feature space in which they could choose to sit either facing or beside their coactors. The design of this study was based on a five by five matrix with five side by side distances occurring in association with five face to face distances. For both the side by side and face to face orientations, the manipulations in distance took on values of either one, two, three, four, or five feet. This twenty-five condition design allowed for the observation of subjects' seating choices given such situations as a side by side distance of two feet and a face to face distance of four feet. Results from the study indicated that when the face to face distance was less than or equal to the side by side distance, subjects chose to sit facing each other. When the face to face distance was greater than the side to side distance, subjects chose to sit beside their coactors.

This relationship between orientation and interpersonal distancing has been further delineated by DeLong (1977a, 1977b). He discusses the interaction between these two proxemic modes in terms of the degree of interpersonal accessibility that is afforded by any distance-

orientation combination. That is, the orientational context in which an interpersonal distance occurs affects the overall amount of interpersonal access between the two interactants. As has been discussed earlier in this chapter, the literature on the Immediacy System Theory indicates that face to face orientations are the most immediate (i.e., provide the greatest degree of interpersonal access) followed by right angle orientations, with side by side orientations permitting even less interpersonal involvement. Consequently, given the identical interpersonal distance, there is less involvement within an interacting dyad as the orientation becomes less direct. In other words, the same distance is perceived differently according to the orientational context in which it occurs. Thus, in order to achieve the same degree of interpersonal access given two different orientational contexts, it is necessary to alter the degree of proximity between the coactors. Conversely, two different interpersonal distances can be made to allow the same degree of accessibility if the orientation is appropriately altered.

DeLong (1977a, 1977b) has found that people do indeed recognize this manner in which distancing and orientation interact to establish the desired degree of involvement with another person. In scale model studies designed to replicate Hall's distance zones, DeLong found that the distances chosen for different types of social interaction (personal-far, social-close, etc.) were influenced by the orientational context in which the distance choice was made. The overall pattern was that in order to achieve a level of interpersonal accessibility appropriate to any given type of social interaction (such as social-close, etc.),

greater distances were always associated with face to face orientations, while smaller distances were consistently associated with side by side orientations. As a specific example of this phenomenon, when subjects were asked to choose distances appropriate for a social-close interaction, they chose an average distance of five feet, eleven inches in face to face orientational contexts, compared to an average distance of four feet, eight inches in side by side orientational contexts. That is, in order to achieve the same degree of interpersonal accessibility, closer distances were required in side by side orientations than in face to face orientations.

Thus the studies of Sommer and DeLong not only provide data supporting the idea that the Immediacy System Theory is applicable to seating choices, they reaffirm the notion that interpersonal distancing cannot be fruitfully examined in the absence of consideration to orientational factors without running the risk of obtaining misleading results.

Sex Differences in Immediacy Behaviors

There have not been a great number of studies conducted examining the interplay of proxemic behaviors in terms of the Immediacy System Theory. Fewer studies yet have concentrated on sex differences in the interrelationships among immediacy system behaviors. It is the purpose of this section to review those sex difference studies that are available in terms of how these differences are manifest in standing and seated dyads.

Sex differences in the immediacy behaviors of standing dyads. With respect to sex differences in the immediacy behavior of standing dyads,

it is interesting to note that most of the studies in this area have focused on the proxemic behavior of children, as opposed to that of adults. For example, in one of the few genuine field studies of multiple proxemic modes, Aeillo and Jones (1971) obtained naturalistic observations of the immediacy behavior of children at free play during lunch and recess periods. In their study, trained teacher-judges unobtrusively observed the orientations and interpersonal distances adopted by same sex dyads of children from the first and second grades. Analysis of the observational data from the study indicated that the juvenile male dyads assumed significantly greater interpersonal distances than their female counterparts, as was expected. However, at the same time, male dyads adopted significantly more direct orientations.

The former finding of the Aeillo and Jones study--that male dyads assumed greater interpersonal distances than female dyads--was also reported by Aeillo and Aeillo in 1972. In their investigation of the proxemic behavior of children aged six through sixteen, unobtrusive observations were taken of the orientation and distancing behaviors of same sex dyads as they stood discussing their favorite television program. Again, male dyads displayed greater interpersonal distances than female dyads. But contrary to the results reported by Aeillo and Jones, male dyads in this study also assumed significantly less direct orientations than female dyads.

Less direct orientations in male dyads have also been reported by Jones and Aeillo (1973). They observed the orientation and distancing behaviors of first, third, and fifth grade children as they stood

discussing their favorite television commercial. Analysis of the orientation data revealed that the male dyads assumed significantly less direct orientations than female dyads during the standing interactions. The researchers explained that this finding was expected because of the positive relationship between more direct orientations and looking (Mehrabian, 1968a, 1968b), and the tendency for males to look at their coactors less than females (e.g., Exline, 1963; Libby, 1970). The researchers, however, obtained unexpected results with respect to the distancing preferences of males and females. In contrast to the findings of Aeillo and Jones (1971) and Aeillo and Aeillo (1972) that males assumed greater interpersonal distances than females, data from the Jones and Aeillo study revealed no sex differences in the interpersonal distancing preferences of male and female dyads.

It is only at this point that it is possible to cite a total replication in findings on sex differences in orientation and distancing behaviors. Jones (1971) obtained data completely dovetailing those reported by Jones and Aiello. Jones unobtrusively observed the orientations and interpersonal distances assumed by dyads of adults interacting on New York City streets. Females were found to adopt more direct shoulder orientations than males. Further, there were no sex differences in interpersonal distancing; 80 percent of all the dyads observed interacted at distances between one and a half and two and a half feet.

In summary, although the results from studies concerning sex differences in the immediacy behavior of standing dyads have not been entirely consistent, they nevertheless all support the notion that

males prefer less immediacy with others than females. But, as this review has revealed, their desire for less immediacy is not always expressed through the same proxemic mode. That is, males may demonstrate their preference for less involvement with others either through greater interpersonal distancing or through the adoption of less direct orientations. Factors influencing the ways males are likely to express their preference for less immediacy remain undelineated. Consequently, it is a major purpose of the present research to discern whether dyadic sex composition and type of setting have an impact on the mode(s) through which adult males and females are likely to demonstrate their differential preferences for degree of involvement with others.

Sex differences in the immediacy behaviors of seated dyads. Studies of sex differences in the immediacy behavior of seated dyads have been of two genres. In the first type of study, subjects are allowed to freely place their chairs in relation to a seated person with whom they expect to interact. In these investigations, the researcher's primary interest is to examine the distancing and orientation preferences of people under different social and environmental conditions.

Studies employing this methodology have produced somewhat inconsistent results. First, incompatible results with respect to distancing have been reported in studies considering multiple modes of proxemic behavior. For example, Beach and Sokoloff (1974) observed the distancing, orientation, and eye behavior of four and five year old children allowed to seat themselves as they chose in order to play with blocks. Only one sex difference in immediacy behavior emerged;

females adopted significantly greater distances toward others than did males. These results are in direct opposition to those reported by Pellegrini and Empey (1973) in their study of sex differences in seating choice in relation to a seated same sex listener. In this case, females chose significantly smaller interpersonal distances for their interactions. Finally, in Mehrabian's three separate investigations of subjects' seating preferences in relation to imagined addressees, sex of subject had no effect on interpersonal distancing choices (Mehrabian, 1968a, 1968b; Mehrabian and Friar, 1969).

Multi-modal studies considering orientation behavior within seated dyadic interactions have likewise produced mixed results. Mehrabian (1968a, 1968b), as well as Beach and Sokoloff (1974), reported no sex differences in orientation choices for seated interactions. However, Mehrabian and Friar (1969) and Pellegrini and Empey (1973) found sex differences in this immediacy behavior such that females adopted significantly less direct orientations toward others than did males.

As was mentioned earlier, studies on sex differences in the immediacy behavior of seated dyads have also taken a second form. In this second type of methodology, the researcher varies the distance between two interactants and examines the effects of the manipulations on visual behavior. Investigations employing this methodology have suggested that males and females respond similarly to manipulations of interpersonal distancing. The earliest of these studies was conducted by Argyle and Dean in 1965. In this study of the effects of distancing on eye behavior, subjects interacted with confederates at distances of

either two or ten feet while oriented at a 90 degree angle. Subjects of both sexes displayed significantly greater amounts of looking when seated ten feet away from their coactors.

In the first part of a two part study, Argyle and Ingham (1972) replicated the findings reported by Argyle and Dean. That is, when subjects were asked to interact with others within a 90 degree orientation at distances of either two or ten feet, the looking behavior of both sexes increased when the interpersonal distance was increased. In the second part of the study, the orientation was changed to face to face, and the distance manipulations were set at three and six feet. Again, the looking behavior of both males and females increased with distance, albeit to a lesser degree.

Russo (1975) demonstrated that children of both sexes show the same visual behavior reaction to interpersonal distances as adults. In her study, male and female same sex dyads from kindergarten and the third and sixth grades interacted at distances of either one, three and a half, or six feet while seated directly facing each other. Analysis of the children's eye behavior revealed that while the mean length of glances did not increase with distance, both male and female dyads engaged in significantly more eye contact as interpersonal distancing increased.

Only two studies reviewed reported a variation from the linear relationship between interpersonal distancing and looking behavior due to sex differences. Aeillo (1972) conducted a laboratory study in which he varied both the orientation (face to face or right angle) and interpersonal distance (two, six, or ten feet) of seated subject-confederate dyads. When the dyads were interacting within a 90 degree

orientation, the linear relationship between distancing and amount of looking held up; i.e., for both males and females, the mean length of glances and the overall amount of looking increased linearly with distance. However, sex differences emerged when the interactions occurred within face to face orientational contexts. While males displayed the same pattern of linear increases in looking as distance increased, females did not. For females, both the mean length of glances and the overall amount of looking increased from two to six feet, but dropped off severely in the ten foot condition. Aeillo suggested that this unexpected sex difference may have appeared because females are more interested than males in social stimuli, and that such a great interpersonal distance of ten feet "lacked necessary reinforcement value for women, especially in the more direct orientation where a greater amount of 'availability' for interaction exists" (p. 336).

In 1977, Aeillo further investigated this sex difference in visual behavior responses to seated interpersonal distance manipulations. Here, the visual behavior of males and females was observed as interpersonal distance was increased up to a ceiling of fourteen feet within 0 degree orientational contexts. The results from the study revealed that males continued to look more as distance increased all the way up to the fourteen foot condition. Females, however, ceased to increase their looking behavior as distance increased beyond interpersonal distances of seven feet.

Aeillo's findings highlight the importance of orientational context in investigating sex differences in the effects of seated

interpersonal distances on visual behavior. That is, within right angle orientational contexts, males and females react similarly to manipulations of interpersonal distance; both sexes increase looking behavior as distance increases, at least up to a ceiling of ten feet (Argyle and Dean, 1965; Argyle and Ingham, 1972; Aeillo, 1972, 1977). However, when the orientational context is set at 0 degrees, sex differences emerge in subjects' responses to increases in distance; females cease to increase their looking behavior with distances beyond interpersonal distances of seven feet (Aeillo, 1972, 1977).

In reviewing the research on sex differences in the immediacy behaviors of seated dyads, it is apparent that much work is still required. Contradictory results have been reported both with respect to sex differences in distancing behavior, and with respect to sex differences in orientation behavior. Only sex differences in subjects' visual behavior responses to distancing manipulations seem to be fairly well delineated. But even here, the sex differences have been confirmed only within the laboratory. There is no assurance that the same visual behavior phenomena will occur in the field where both visual behavior and interpersonal distance are allowed to vary freely.

Conclusions

In concluding this chapter, it is appropriate to point out that while considerable support for the Immediacy System Theory has accrued over the last fifteen years, much more research is still necessary in this area. For example, although studies in this area have generally supported the theory's predictions about the relationship between

distancing and visual behavior and the relationship between distancing and orientation, studies concerning the relationship between orientation and visual behavior have produced contradictory results. There have been reports of significant associations between more direct orientations and less looking behavior (Patterson, 1973a; Watson and Graves, 1966), as well as reports of significant associations between more direct orientations and more looking behavior (Beach and Sokoloff, 1974; Mehrabian, 1968a, 1968b). More research on the relationship between these two proxemic behaviors is clearly required. A second problematic aspect of the literature in this area is the dearth of field research. The vast majority of the studies were conducted in the laboratory where at least one of the immediacy system behaviors was under the experimental control of the researcher. The ability of the Immediacy System Theory to predict the relationships among proxemic behaviors when they are all allowed to vary freely remains largely uninvestigated. These "natural" relationships among proxemic behaviors may be discerned only through unobtrusive observational techniques. Finally, more research is needed in this area which examines distancing, orientation, and visual behavior simultaneously. Most of the previous research has focused on the relationships between pairs of proxemic behaviors. This lack of tri-modal research is illustrated in Patterson's 1973 review of the empirical support for the Immediacy System Theory. Only two of the nineteen studies reviewed examined more than two proxemic behaviors. The present research addresses itself to these three inadequacies within the literature on immediacy behavior. That is, the present study a) reexamines the relationship between orientation

and visual behavior, b) employs a naturalistic observation technique of data collection, and c) considers distancing, orientation, and visual behavior simultaneously.

CHAPTER V

THE EFFECTS OF PHYSICAL SETTING ON SOCIAL INTERACTION AND PROXEMIC BEHAVIOR

At this point in time, there is only a limited amount of information available concerning the effects of physical setting on social interaction and proxemic behavior. This state of affairs is not surprising when one considers the fact that both environmental psychology and the study of proxemics are relatively new areas of inquiry. It is the purpose of this chapter to review what is currently known about the potential effects of aspects of physical settings on these types of social behavior. The following discussion is divided into two main sections. The first section reviews the literature on the ways in which aspects of the physical setting can influence social interactions. The second section reviews the information that is available concerning the effects of physical setting on proxemic behavior.

The Effects of Physical Setting on Social Interaction

The effects of sociofugal and sociopetal spaces on social interaction. One of the major ways in which a physical setting can influence social behavior is the degree to which the space is sociofugal or sociopetal. Sociofugal spaces are those spaces which are organized, through the placement of fixed and semi-fixed features, to "produce solitarity," while sociopetal spaces are organized to be "conducive to

communication between people" (Hall, 1968, p. 91). As Sommer (1969) wrote, "Sociofugal arrangements drive people toward the periphery of a room as contrasted to sociopetal arrangements, which focus people towards the center and thereby bring them together" (p. 121).

Because the concept of sociofugal and sociopetal organization is important to the present research, it is appropriate to describe how this concept developed. The notion of sociofugal and sociopetal organization was first put forth by a physician named Humphrey Osmond in 1957. He had observed that certain spaces, such as train station waiting rooms, tended to inhibit social interaction, while other spaces, such as sidewalk cafes, tended to facilitate social interaction. He had also observed that the spatial organization of a hospital ward, of which he was in charge, seemed to discourage interaction. In this ward, chairs were maintained in rows against the walls of the space for ease of maintenance. As Hall (1966, pp. 108-110) describes the evolution of events, Osmond was troubled by the sociofugal effects of the locations of chairs within the wards because the consequence had been that the patients had become "like the furniture, permanently and silently glued to the walls at regular intervals between the beds" (Hall, p. 108). The situation prompted Osmond to engage the aid of Robert Sommer to determine how the space could be reorganized so that it would facilitate social encounters. To accomplish this task, Sommer observed the locations of interacting individuals within the hospital cafeteria where social interactions frequently occurred. He discovered that pairs of interacting people seated around a six seat rectangular table were most likely to be sitting at 90 degree angles at one corner

of the table. Given this observational information that corner positions were the most conducive positions for interactions at a table, Osmond and Sommer reorganized the space in the ward by introducing square tables with chairs into the space. It was hoped that the tables and chairs would change the ward into a more sociopetal space in which interactions would be more likely to occur. Observations of social interaction behavior before and after the spatial reorganization of the ward indicated that this effect was achieved; the number of conversations observed in the ward doubled after the introduction of the tables and chairs into the space. This collaborative work, then, served to provide some of the first empirical evidence for the notion that the organization of space can affect human social behavior.

Given Robert Sommer's involvement in the inception of the notions of sociofugal and sociopetal spatial organizations, it is not surprising that he has provided much of the information that is available concerning the way furniture and its arrangement can affect social behavior. He has examined the effects of sociofugal and sociopetal spatial organizations within classroom settings, public facility settings (such as hotel lobbies and airport waiting areas), and settings designed for study (such as college dormitories and libraries).

Within classroom settings, Sommer investigated the role spatial organization plays within the "ecology of participation" (1969, p. 113). In his research, he compared the participation of students seated in a classical straight row arrangement to the participation of students seated in a horseshoe arrangement. Within the straight row desk

arrangement, Sommer found that student participation came mainly from the center areas of each row, and that more participation came from the front row than from other rows. These areas of the classroom represented zones in which there was "maximum visual contact with the instructor" (1969, p. 116). Within the horseshoe seating arrangement, most of the student participation came from students seated directly across from the instructor. Overall comparisons of the participation levels within the two different seating arrangements indicated that fewer students participated within the horseshoe seating arrangement setting than in the straight row seating arrangement setting; however, those students who did speak within the horseshoe seating arrangement did so for longer periods of time.

Sommer (1969) also speaks about the effects of sociopetal and sociofugal spatial organizations on behavior within public settings such as hotel lobbies and airport waiting areas. He points out that the intention of the people who design these areas is to create sociofugal spaces which inhibit social interaction so that people will move on to other, sociopetal spaces (mainly bars and cafes where they will spend money). The ways in which designers are able to discourage social interactions in these spaces is to (a) make these spaces rather small, (b) to arrange the furniture in such a way as to make direct orientations difficult, and (c) even to install intentionally uncomfortable seats, such as the Larsen chair, which was designed to exert uncomfortable pressure on the user's spine (1969, p. 121). In contrast, bars and cafes are designed to encourage social interaction, and seem to do so quite effectively. As Sommer

(1969) points out, anyone who wishes to maintain solitarity within such sociopetal spaces can only accomplish this by "bunching himself up at the end of the bar and staring down at his drink, or sitting at a remote table facing the wall, but these positions and postures must be maintained rigorously" (p. 122).

With respect to the ecology of study areas, both within libraries and dormitories, Sommer recognizes that there are individual differences and situational differences in studying behavior that can affect whether students will prefer sociopetal or sociofugal areas for their studying activities. With regard to individual differences in preferences for sociopetal or sociofugal areas for studying, Sommer writes, "There is no such thing as an optimal study environment for all students. We have conducted extensive interview and observational studies of how students read and study. Some retreat to the farthest part of the library stacks and work by themselves, and others prefer large reading rooms where other people are working around them" (1969, p. 139). In another, collaborative study (Norum et al., 1967), Sommer determined that the situational factor of type of task also influences whether people will prefer sociopetal or sociofugal spatial relationships with others while studying. In this investigation, which involved both children and college students, it was discovered that dyads performing a task in cooperation with one another tended to prefer adjacent seating around a table, while dyads performing tasks in competition or independently from one another preferred more distant seating arrangements.

It should be noted that in view of the theoretical and, indeed, the practical importance of the notion that social interaction may be

inhibited or facilitated through the organization of space, there has been a surprising dearth of research on sociopetal and sociofugal spaces. As recently as 1974, there have been calls for investigations of the effects of sociopetal and sociofugal spaces on social behavior (Watson, 1974, p. 340). It is a purpose of the present research to examine differences in the proxemic behavior of interacting dyads that are attributable to whether the dyads are within a space designed for interactions (a lounge), or within a space that is not designed for social interactions (a foyer).

Seated spatial relationships and social interaction. A number of studies have demonstrated that the spatial relationships between people engaging in dyadic and group interactions can affect the nature of those interactions. As was mentioned earlier, Sommer (1969) has reported that the practice of bolting down chairs, side by side, in long row arrangements in airport waiting areas quite effectively inhibits social interaction. Mehrabian and Diamond (1971) have also reported that side by side seating inhibits social interaction, even among subjects who have been determined to be high in affiliative needs.

Other studies, which have considered seating arrangements around tables and their relationships to group dynamics have also reported this association between spatial relationships and interaction. That is, when groups of individuals are seated around tables for seminars or group discussions, people are more likely to address their remarks to those seated across from them than to those seated adjacent to them (e.g., Hearn, 1957; Sommer, 1969; Steinzor, 1950). It is possible that three types of factors are operative in creating a tendency for

people to address their comments to those sitting opposite them at a table rather than to those sitting adjacent to them at a table. First, as Sommer has suggested, the greater possibility for mutual visual regard between people facing each other may be a determinant of this phenomenon. That is, people may speak to those opposite them at a table because the opening and maintenance of communication channels through mutual facial regard are more easily accomplished when the addresser is at the opposite side of the table from the addressee (Sommer, 1967, 1969).

This phenomenon may also be viewed as a reflection of the dominance hierarchy within the group. That is, leaders within groups tend to position themselves opposite from one another at tables (De Long, 1970; Sommer, 1959). As leaders in the group, they account for a sizeable amount of the comments that are made within the situation. Consequently, observations of social interaction behavior within the seating arrangement indicate a tendency for speakers to address those opposite from them rather than those adjacent to them.

Finally, the preference for speakers to address those opposite them at a table rather than those adjacent to them at a table has been explained in terms of the Immediacy System Theory (Argyle and Dean, 1965). The rationale here is that if a speaker turned to an adjacent member of the group, the combination of the close proximity, direct orientation, and visual contact would make the degree of psychological intimacy between them uncomfortably great. As a result, people prefer to address those opposite from them at the table because of the increased interpersonal distance and the presence of a physical barrier (the table).

Thus, this section has demonstrated that both the sociopetal-sociofugal nature of a space as well as interpersonal spatial relationships within a space affect social interaction behavior. In recognition of these physical setting influences, in the present research, the location of the dyads within the spaces and the orientation of the chairs chosen by seated dyads were recorded.

The Effects of Physical Setting on Proxemic Behavior

The amount of scientific literature available concerning the effects of physical setting on proxemic behavior is, as yet, rather limited. However, the research that has been conducted in this area has demonstrated that there are at least three ways in which aspects of the physical setting can influence proxemic behavior. First, the size of interior settings has been demonstrated to affect proxemic behavior. Secondly, studies have indicated that the familiarity of the physical setting can influence proxemic behavior. Finally, there is some suggestion that proxemic behavior is affected by whether the setting is indoors or outdoors.

The effects of the size of the physical setting on proxemic behavior. Two investigations seen in the literature have indicated that interpersonal distances decrease as the size of the interior space is decreased. Sommer (1962) performed a study in which he examined the seating choices of dyads within a small room (10 feet by 10 feet) and a large room (46 feet by 48 feet). In previous research (Sommer, 1961), Sommer had determined that when two couches were placed face to face at varying distances, pairs of interacting subjects preferred

to sit facing one another when the couches were less than 5.5 feet apart. Beyond this distance, subjects preferred to sit next to one another on the same couch. In his 1962 study, Sommer investigated the effects of room size on this seating choice pattern. To accomplish this, he varied the face to face distances between two pairs of chairs in the large and small rooms and noted whether subjects chose to sit across from or beside one another in order to engage in social interactions. The results from the study revealed that the size of the interior space significantly affected interpersonal distance choices such that greater face to face distance choices occurred in the small room than in the large room.

In a much more recent study, White (1975) reported the same phenomenon. His investigation differed from Sommer's study in two respects. First, the ratio of difference in the floor areas was different. In Sommer's study, the square footage ratio of the small room to the large room was 1:18. In White's study, the small room was 9 feet by 15 feet and the large room was 15 feet by 30 feet; thus, the ratio of the square footage in the small room to the square footage in the large room was approximately 1:3. White's research also differed from Sommer's work in that White allowed the subjects to freely place their chairs in relation to one another within the space. In spite of these differences in methodology, the same effect for setting size emerged; significantly larger interpersonal distances occurred in the small setting than in the large setting. Within the small setting, the mean interpersonal distance was 68 inches and the mode was 50 inches, while in the large room, the mean interpersonal distance was 76 inches and the mode was 80 inches.

The effects of the familiarity of the setting on proxemic behavior. With respect to the effects of setting familiarity on proxemic behavior, there is some evidence that, at least for children, interpersonal distances between intimates are smaller within unfamiliar settings. Castell (1970) observed the interpersonal distancing behavior of children between 1½ and 3 years of age within home environments and unfamiliar environments. The distances the children maintained from their mothers were significantly smaller within unfamiliar environments than within home environments. Bass and Weinstein (1971) have also reported data indicating that distances between juvenile intimates tend to be smaller within unfamiliar settings than within familiar settings. In their investigation, subjects between five and nine years of age were asked to place pairs of figures on a background which represented either a living room or a principal's office. When the figures were described as representing the self and a friend, the subjects chose significantly closer inter-figure distances in the principal's office setting than in the living room setting.

Differences in proxemic behavior as a function of whether the setting is indoors or outdoors. Two studies seen in the literature suggest that interpersonal distances are smaller within outdoor settings than within indoor settings. Little (1965) conducted a two part study which investigated the effects of setting and degree of acquaintance on interpersonal distancing preferences. In the first part of the study, undergraduate subjects were asked to place pairs of silhouettes in relation to one another under different setting and

acquaintance level situation descriptions. The setting descriptions were: (a) a street corner, (b) an office waiting room, (c) the lobby of a public building, and (d) a campus location. In the second part of the study, undergraduate subjects were asked to "direct" live actresses in their interpersonal distancing behavior under the same situation descriptions. Within both methodological approaches, the results were the same. Interpersonal distances were smaller for friends than for strangers, and interpersonal distances were greatest within the office setting, and smallest within the street corner setting. Pempus, Sawaya, and Cooper (1975) also have reported data indicating that interpersonal distances are smaller within outdoor settings than within indoor settings. In their study, they found that approach distances within adult dyads were significantly greater inside of buildings than outside of buildings. Bell, Fisher, and Loomis (1978), have suggested that interpersonal distances tend to be smaller within outdoor settings because coactors perceive more control over interpersonal distances when they are out of doors. That is, these authors interpret the differences in distancing behavior within indoor and outdoor spaces as a reflection of a "differential physical availability of escape; when we know we can get away, we're content with less space" (p. 156).

Conclusions

The present chapter has reviewed the ways in which physical setting can influence social interaction and proxemic behavior. Specifically, this review has presented evidence that social interaction behavior is affected both by the sociopetal-sociofugal

nature of interior spaces, and by spatial relationships (seating arrangements) within interior spaces. Additionally, the research presented in this chapter has indicated that proxemic behavior is influenced by setting size, setting familiarity, and whether the setting is in or out of doors. It is clear that the amount of knowledge concerning the effects of physical setting on social interaction and proxemic behavior is still relatively small. However, insights pertinent to the present research may be gleaned from the information presented in this review.

For example, Sommer's (1962) and White's (1975) finding that seated interpersonal distance tends to increase as the size of the interior space is decreased provides insight about the interpersonal distancing behavior that is likely to occur within large and small hallways. That is, on the basis of these two investigations, it was hypothesized that the interpersonal distancing behavior observed in ambulatory dyads would be significantly affected by the physical size of a hallway such that greater interpersonal distances would occur in a small hallway than in a large hallway.

The literature reviewed in this chapter is also pertinent to the present research concerning proxemic behavior within lounges and foyers. That is, the presence of semi-fixed features within the lounge setting, and the absence of such features within the foyer setting play a role in determining what kinds of behaviors are likely to occur within each setting. Lounges and foyers are different types of behavior settings largely because the spatial organizations of the spaces are sociopetal and sociofugal respectively. The present research

examined the effect of the natures of behavior settings, as partially determined by the spatial organizations of the settings, on the proxemic behaviors of dyads engaging in the same activity--social interaction. In other words, the present research compared the proxemic behaviors of dyads engaging in an activity for which the space was designed to the proxemic behaviors of dyads engaging in a behavior for which the space was not designed. Based on the research presented in this chapter which suggests that people seek out sociopetal spaces for social interactions, and that sociopetal spaces are supportive of social interactions, it was hypothesized that the proxemic behaviors of dyads interacting within a lounge would be more immediate than the proxemic behaviors of dyads interacting within a foyer.

CHAPTER VI

THE EFFECTS OF SEX COMPOSITION AND SIZE OF INTERIOR SETTING ON THE INTERPERSONAL DISTANCING BEHAVIOR OF AMBULATORY DYADS

I. Introduction

The present study examined the effects of sex composition and size of interior setting on the interpersonal distancing behavior of ambulatory dyads. This research was undertaken because, as the literature review illustrated, there is a general dearth of information about the interpersonal distancing behavior of ambulatory dyads. In fact, only three of the more than 140 studies reviewed by this author considered ambulatory distancing behavior. One of these three investigations was a simulation study conducted by Lewit and Joy in 1967. They asked subjects to position pairs of figures under a variety of social and situational conditions. The extent of information on ambulatory distancing behavior provided by this study was the report that subjects placed pairs of moving figures (either ambulating or on horseback) at greater interpersonal distances than stationary figures.

The two other studies reviewed which considered ambulatory distancing behavior involved the invasion of ambulating people. One of these studies was performed by Sobel and Lillith in 1975. They instructed male and female confederates to walk head on into individuals ambulating on a public sidewalk. The dependent variables in the study were the point at which the individuals deflected from their paths

in order to avoid the confederates, and the distance between the individuals and the confederates as they passed one another. The researchers reported that male confederates were given significantly less frontal space than female confederates; subjects deflected from their paths in order to avoid collisions with the confederates at an average distance of 37 inches when the confederate was male compared to 56 inches when the confederate was female. Additionally, the researchers reported that of the 40 percent of trials in which the subject and confederate brushed shoulders when passing each other, male confederates were brushed significantly more often than female confederates. These findings are rather interesting because the majority of studies on sex differences in distancing behavior have indicated that interpersonal distances tend to be less when there is a female involved (e.g. Baxter, 1970; Edwards, 1972; Lomranz et al., 1975; Willis, 1966).

Knowles (1972) also investigated the reaction of ambulatory people to frontal invasion. In this study, confederates walked head on into male, female, and mixed sex dyads as they ambulated on a sidewalk. Knowles was interested in observing whether the dyads avoided the invader by splitting up or by moving to one side as a unit. The results from the study revealed sex differences in the dyads' responses to frontal invasion; 83 percent of the mixed sex dyads moved to one side as a unit to avoid the confederate, compared to 62 percent of the female dyads, and 33 percent of the male dyads.

Inasmuch as these three studies represent the extent of information available on the interpersonal distancing behavior of ambulating people, it is clear that more research is required in

this area. First, heretofore, there have been no non-manipulative, unobtrusive observational investigations of how people naturally space themselves while ambulating. Secondly, there is no information about possible differences in ambulatory distancing behavior due to dyadic sex composition. Although Sobel and Lillith (1975) and Knowles (1972) both reported sex differences in the behavior of ambulating people, these sex differences concerned only spatial reactions to frontal invasion. Possible sex differences in natural interpersonal distancing behavior during ambulation remain unexplored. Finally, largely as a reflection of the overall lack of environmental research, there is an absence of information about how setting differences may affect ambulatory interpersonal distancing behavior.

The present research addressed itself to these three aspects of ambulatory distancing behavior requiring further attention. First, the design of the study allowed for the naturalistic observation of interpersonal distancing behavior during ambulation. Secondly, the study examined the possible effects of dyadic sex composition on distancing behavior. Thirdly, the study considered the potential impact of environmental factors on distancing behavior; specifically, the possible influence of variations in setting size was examined.

In order to investigate the effects of dyadic sex composition and size of environment on the naturally occurring interpersonal distancing behavior of ambulatory dyads, the shoulder to shoulder distances of 60 male, 60 female, and 60 mixed sex dyads were unobtrusively observed as the dyads ambulated within either a large or

small hall. There were two hypotheses for this study. First, it was hypothesized that the dyads would demonstrate a sensitivity to the size of the environment by ambulating at greater interpersonal distances within the small hall than within the large hall. Due to the current dearth of information on the impact of setting on ambulatory dyads, this hypothesis lacked specific empirical underpinnings. However, past research on the effects of interior setting size on the distancing behavior of stationary dyads has indicated that people choose larger interpersonal distances as the size of the interior space is decreased. That is, Sommer (1962) and White (1975) have both reported that seated interpersonal distances increased as the size of the interior environment was decreased.

The second hypothesis of the study was that dyadic sex composition would affect interpersonal distancing behavior such that male dyads would ambulate at the greatest interpersonal distances, followed by female dyads, with mixed sex dyads ambulating at the closest interpersonal distances. This prediction was based on past research on sex differences in the interpersonal distancing behavior of stationary dyads which has indicated that mixed sex dyads prefer closer interpersonal distances than same sex dyads (e.g., Duke and Nowicki, 1972; Guardo, 1969, Harnett et al., 1970) and that female dyads prefer closer interpersonal distances than male dyads (e.g., Aeillo and Jones, 1971; Aeillo and Aeillo, 1972; Baxter, 1970).

II. Methods

In order to investigate the effects of sex and setting on ambulatory interpersonal distancing behavior, two unobtrusive observers recorded the shoulder to shoulder distances of male, female, and mixed sex dyads as they ambulated within either a large or small hallway.

Subjects

Subjects for the first study were 60 male, 60 female, and 60 mixed sex dyads observed while walking down one of two specified hallways in the Student Center at The University of Tennessee at Knoxville. The dyads had to satisfy a number of criteria in order to be eligible for observation. First, those not deemed to be White Americans were excluded in order to control for differences in proxemic behavior due to race or culture (see, for example, Hall, 1968; Jones, 1971). Secondly, neither member of the dyad could be wearing a name tag or badge. This stipulation was included to preclude observation of freshman orientation participants and other non-students attending functions at the University. Thirdly, no people with obvious physical stigmas were coded because physical stigma can affect distancing behavior (e.g., Lerner et al., 1975). Finally, both members of the dyad were required to have their arms down by their sides as they walked. This rule controlled for the degree of body accessibility within the dyad, an important factor within proxemic behavior (e.g., Hall, 1968).

In the final sample, the vast majority of the subjects (89 percent) were judged as college students between the ages of 18 and 29. Thirty-eight (11 percent) were judged as being between 30 and 58 years old.

Independent Variables

There were two independent variables in the first study. The first independent variable was the sex composition of the ambulatory dyad: male-male, female-female, or male-female. The second independent variable was the physical size of the setting in which the dyads were moving. Two halls in the Student Center which were comparable in usage, but which differed in size, served as the settings. The large hall was 168.3 feet long and 18.9 feet wide; the small hall was 71.7 feet long and 9.7 feet wide. It is interesting to note that both of these pathways had "museum" type features built into them. In the large hall, visiting collections of art work such as photography were periodically placed on exhibit. In the small hall, there were two bulletin boards for student advertisements which were changed weekly. Figures VI-1 and VI-2 contain photographs of the small and large halls, respectively.

Dependent Variables

The primary dependent variable was the shoulder to shoulder distances, in inches, between the members of the ambulatory dyads. Additionally, the subjects were categorized with respect to age and status. All those who appeared to be students between the ages of 18 and 29 were simply coded "student." The observers estimated the ages of the small proportion of subjects who did not appear to be students. Finally, the exact time of day and the date of the observations were noted.

Figure VI-1. Photograph of the small hallway.

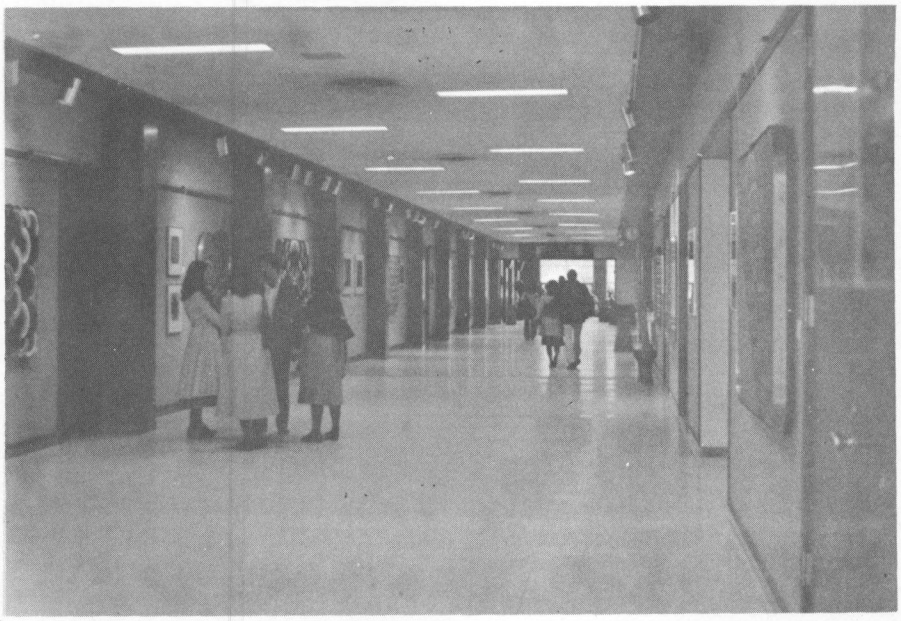

Figure VI-2. Photograph of the large hallway.

Pre-studies

Prior to the collection of data, two separate studies were undertaken in order to gain empirical demographic information about the users of the two halls, and to determine density levels in the halls during observation periods.

In the first pre-study, the two raters polled 200 randomly chosen individuals either entering or exiting the two pathways. They inquired about the status of the individual, estimated the age of the person, and recorded his or her sex. Comparison of the data from the large and small halls revealed that the two groups of users were homogeneous demographically. Fifty-three percent of those polled were males, 47 percent were females (see Table VI-1). The majority (128) of the users were students. Additionally, there were 30 faculty members, 25 part-time students, and 17 staff personnel (see Table VI-2). Ninety percent of those polled were judged to be between 18 and 29 years of age (see Table VI-3).

The second pre-study examined density levels in the two halls during coding periods. Since observations for the actual study were made between 8:00 A.M. and noon, and between 1:00 P.M. and 5:00 P.M., density measures were taken in both halls at approximately 8:30, 9:30, 10:30 and 11:30 in the morning and at 1:30, 2:30, 3:30 and 4:30 in the afternoon. The noon hour was avoided altogether because of the crowded conditions caused by lunch-time rush. In order to determine the density levels, the researcher's assistants recorded the number of people who passed, going in either direction, a specified point in the middle of each of the halls for a two-minute period. Table VI-4 contains the density information acquired through this study.

TABLE VI-1

SEX OF USERS OF THE LARGE AND SMALL HALLS

(N = 200)

	Large Hall		Small Hall		Total (Proportion)	
Time of Day	8-12 A.M.	1-5 P.M.	8-12 A.M.	1-5 P.M.		
Female	23	17	27	17	84	(.42)
Male	27	33	23	33	116	(.58)
	50	50	50	50	200	(1.00)

Large Hall: 40 female, 60 male

Small Hall: 44 female, 56 male

TABLE VI-2

STATUS OF USERS OF THE LARGE AND SMALL HALLS

(N = 200)

	Large Hall		Small Hall		Total (Proportion)	
Time of Day	8-12 A.M.	1-5 P.M.	8-12 A.M.	1-5 P.M.		
Full-Time Student	29	41	33	38	141	(.71)
Part-Time Student	16	5	11	7	39	(.19)
Faculty	2	3	2	1	8	(.04)
Staff	0	0	2	2	4	(.02)
Visitor	3	1	2	2	8	(.04)
	50	50	50	50	200	(1.00)

TABLE VI-3

AGE OF USERS OF THE LARGE AND SMALL HALLS

(N = 200)

	Large Hall		Small Hall		Total (Proportion)	
Time of Day	8-12 A.M.	1-5 P.M.	8-12 A.M.	1-5 P.M.		
16-17 years	0	1	3	0	4	(.020)
18-29 years	42	45	45	48	180	(.900)
30-39 years	4	1	1	0	6	(.030)
40-49 years	3	1	0	1	5	(.025)
50-59 years	1	2	1	1	5	(.025)
	50	50	50	50	200	(1.00)

TABLE VI-4

OBSERVED DENSITY LEVELS WITHIN THE LARGE AND SMALL HALLS DURING SPECIFIED TIME PERIODS*

	Setting	
Time of Day	Large Hall	Small Hall
8:30 A.M.	20	12
9:30 A.M.	27	21
10:30 A.M.	32	23
11:30 A.M.	29	26
1:30 P.M.	31	24
2:30 P.M.	25	19
3:30 P.M.	21	13
4:30 P.M.	21	16

*Number of individuals passing a specified point in the halls during a two minute period.

Procedure

The first issue in examining proxemic behavior in ambulatory dyads was how to decide whether any pair of potential subjects were, in fact, together. As Goffman (1971) has pointed out, there are multi-modal ways in which people communicate that they are "together." These "tie signs" may take a number of different forms; for example, orientation (in stationary dyads), eye contact, verbalizations, and body movement synchrony all can denote that people are with one another. This study was, at first, designed so that observers would record the presence or absence of synchrony within each dyad. However, it became apparent through communication with the observers that the presence of synchrony was the main criterion for defining dyadic relationships in ambulatory people. In the absence of synchrony, only those engaging in conversations or touching one another were perceived to be together.

Given that two potential subjects were judged as being with one another, and that they satisfied the demographic criteria delineated in the "Subjects" section, they had to pass other, situational, stipulations in order to be eligible for observation. First, dyads had to maintain stable interpersonal distances for a distance of at least ten feet; i.e., neither member of the dyad could weave, bump the other, or pause to look at a bulletin board or art display. Secondly, subjects could only be coded while at least fifteen feet from either end of the halls to insure that they were responding to the space in which they were ambulating, and not to the spaces they had just exited or were about to enter. Thirdly, dyads were excluded

if, during the period of their observation, someone passed them going in either direction or if the dyad itself passed a stationary person looking at a bulletin board or art display. Finally, dyads were deemed ineligible for observation if anyone was approaching them from the front within ten feet. The literature (e.g., Knowles, 1972; Sobel and Lillith, 1975) indicates that this last stipulation is indeed worthwhile because ambulating people do "jockey for position" when being approached from a head-on orientation in order to avoid personal space violation. It is noteworthy that the use of ten feet as the distance limit is rather conservative inasmuch as people generally do not deflect from their paths until the approacher is within five feet away (Sobel and Lillith, 1975). Thus this approach limit allows for greater confidence that the proxemic behavior of the dyads is not affected by approaching others, while also aiding in the control of density factors.

The actual data collection for the study was accomplished by two female undergraduates who received independent study credit for their efforts. They recorded the shoulder to shoulder distances between pairs of individuals ambulating in a large and a small hallway in the University Student Center. They also noted the time and date of the observations, and estimated the subjects' ages. While observing, the raters positioned themselves close to one end of the halls because such locations provided the best visual perspective for judging interpersonal distances. Throughout the study, the raters worked together. If their presence was commented upon by anyone, they were instructed to say that they were conducting an observational study

on the apparent status and ages of users of the Student Center for a Sociology course. This cover story was used only three times during the entire study.

Observations of the dyads were made between 8:00 A.M. and 12:00 noon and between 1:00 and 5:00 in the afternoon; the noon hour was avoided due to the high density level caused by lunch rush. Forty-six percent of the observations were obtained during the morning hours, and 54 percent were obtained during afternoon hours.

Observer training and inter-observer agreement. The observers were trained, in three phases, over a period of three and one-half weeks. Inasmuch as the researcher participated in all phases of the training, she is referred to as one of the three observers in the following description of the training procedure.

The first phase of training focused on establishing satisfactory levels of validity in the observers' distance recordings. During this phase of training, the researcher placed two chairs side by side at varying distances and the observers judged the distance between the backs of the chairs. After the distances were independently recorded, the accuracy of the recordings were checked by measuring the actual distance between the backs of the chairs with a tape measure. This phase of training continued for approximately one week at which time Pearson Product Moment correlation coefficients revealed that all three observers' distance recordings significantly correlated with the actual distances between the chairs ($p < .05$).

The second phase of training focused on both the validity and the degree of inter-observer agreement of the observers' judgments of shoulder

to shoulder distances. During this period of training, two associates of the researcher stood side by side at varying interpersonal distances, and the observers recorded the distance between their shoulders. After each trial, the accuracy and the degree of inter-observer agreement were checked. After approximately one week of this type of training, the correlations between each of the observer's recordings and the actual shoulder to shoulder distances were significant beyond the .02 level, and the inter-observer agreement levels were significant beyond the .04 level.

In the third phase of training, inter-observer agreement levels were checked in the field. During this period, the three observers recorded the shoulder to shoulder distances of ambulating dyads of all sex compositions within the large and small halls. After a period of one and one half weeks, inter-observer agreement levels were significant beyond the .03 level. At this point actual data collection was allowed to begin. At the end of the study, an analysis of sample distance recordings of the two data collectors across all settings and dyadic sex compositions yielded an inter-observer agreement level of .95 which was significant beyond the .01 level.

Finally, it should be noted that during the course of the study, the researcher periodically observed dyads with the data collectors both with and without their knowledge. The levels of agreement between her recordings and those of the data collectors were significant beyond the .04 level.

III. Results

In order to determine the effects of spaciousness of setting and dyadic sex composition on the interpersonal distancing behavior of the ambulatory dyads, a two-way analysis of variance was performed on the data. The independent variables for the analysis were setting (large hall and small hall) and the sex composition of the dyad (male, female, and mixed sex). The dependent variable was the shoulder to shoulder distance (in inches) between the members of the dyads.

As Table VI-5 illustrates, there was a significant main effect for spaciousness of setting on the interpersonal distances observed ($p < .001$). The average interpersonal distance of dyads walking in the large hall was 14.0 inches, while the average interpersonal distance for dyads walking in the small hall was 7.7 inches. There were no significant differences based on the sex composition of the dyads. However, male dyads consistently displayed the greatest interpersonal distances ($\bar{X} = 11.8$), followed by female dyads ($\bar{X} = 10.9$), with mixed sex dyads consistently displaying the closest interpersonal distances ($\bar{X} = 9.9$). There were no differences in ambulatory distancing behavior due to subject status or age. The interpersonal distance recorded for each dyad appears in Appendix A.

IV. Discussion

The present study sought to determine whether dyadic sex composition and size of interior environment could affect the interpersonal distances exhibited by dyads engaging in the same activity (ambulation) within the same type of environment (public hallways).

TABLE VI-5

THE EFFECTS OF SEX COMPOSITION AND SIZE OF INTERIOR SETTING ON THE INTERPERSONAL DISTANCING BEHAVIOR OF AMBULATORY DYADS

MEAN INTERPERSONAL DISTANCES
(in inches)

	Sex Composition			
Environment*	Male	Female	Mixed	Total
Large Hall	15.2	14.1	12.7	14.0
Small Hall	8.3	7.8	7.1	7.7
	11.8	10.9	9.9	N = 180

*The effect of environment on the interpersonal distances was significant beyond the .001 level.

The nature of this research was exploratory in two respects. First, there is no information in the literature concerning the effects of the size of interior environments on the interpersonal distancing behavior of ambulatory individuals or groups of individuals. Secondly, heretofore, there have been no investigations concerning the effects of dyadic sex composition on the naturally occurring spacing behavior of ambulatory dyads.

The results from the study indicated that the physical size of the setting significantly influenced interpersonal distancing behavior such that dyads within the small hall ambulated at significantly closer interpersonal distances than dyads within the large hall. This finding was in direct conflict with the hypothesis that interpersonal distances would be less in the large hall than in the small hall. While there were no significant differences in interpersonal distancing behavior due to dyadic sex composition, the direction of the differences was in the predicted direction. In both the large and small halls, mixed sex dyads ambulated at the smallest interpersonal distances, female dyads ambulated at intermediate interpersonal distances, and male dyads ambulated at the greatest interpersonal distances (see Table VI-5).

The strong effect of the size of the interior of the environment on interpersonal distancing behavior is particularly interesting for two reasons. First, the finding that interpersonal distances were greater in the large hall than in the small hall is in direct conflict with past findings regarding the effects of interior space size on distancing behavior. Sommer (1962) and White (1975) have both reported data indicating that interpersonal distances decrease as the size of the interior space is increased. Both of these studies, however,

involved seated pairs of subjects. Thus the present research suggests that the effects of the size of interior environments on interpersonal distancing behavior are different for seated and ambulatory dyads. While seated dyads respond to increases in interior space size by assuming closer interpersonal distances, ambulatory dyads respond to increases in interior space size by assuming greater interpersonal distances.

This finding that reactions to manipulations in interior space size are not the same for seated and ambulatory dyads raises obvious questions about the reactions of standing dyads to space size manipulations. That is, the present research demonstrates that the type of activity in which the dyads are engaging influences the impact space size manipulations will have on their behavior. Consequently, the results of studies on the effects of setting size on the behavior of seated and ambulatory dyads do not necessarily yield information about the effects of setting size on the behavior of standing dyads. Thus, an obvious suggestion for future research is that the effects of setting size on the interpersonal distancing behavior of standing dyads should be investigated.

The strong effect of the size of the halls is also interesting because it is clear that the interpersonal distances observed in the large hallway ($\overline{X}$ = 14.0 inches) could have occurred without physical difficulty in the small hallway, which was 9.7 feet wide. However, the average shoulder to shoulder distance in the small hallway was only 7.7 inches. Thus, the interpersonal distances observed in the small hallway were not a function of physical necessities, but rather a function of choices by the members of the dyads. Further research is needed in order to determine the source of this phenomenon. That is,

do dyads walk closer together in small hallways because of an intimacy that is implied by the smallness of the setting, or are they, in a sense, pushed together by a reluctance to walk close to walls?

Comments are also warranted concerning the issue of sex differences in ambulatory interpersonal distancing behavior. Although the data did not provide statistically significant support for the hypothesis that there would be differences in the interpersonal distancing behavior of dyads (such that mixed sex dyads would ambulate at the closest interpersonal distances, followed by female dyads, with male dyads ambulating at the greatest interpersonal distances), the direction of the sex differences were in the predicted direction within both the large and small hallways. That is, the direction of the sex differences were consistent with the findings of past research on standing and seated interpersonal distancing behavior that have suggested that adult mixed sex dyads prefer closer interpersonal distances than same sex dyads (e.g., Bailey et al., 1973; Lerner et al., 1975; Schwartzwald et al., 1977; Whalen et al., 1973), and that female dyads prefer closer interpersonal distances than male dyads (e.g., Adler and Iverson, 1973; Barrios and Geisen, 1977; Norum et al., 1967; Tennis and Dabbs, 1975).

The consistency in the direction of sex differences in ambulatory distancing behavior, although admittedly nonsignificant, may suggest a reevaluation of the results reported by Knowles (1972). In a study which involved the frontal invasion of ambulatory dyads, Knowles reported that male dyads were most likely to split in order to avoid the invader, followed by female dyads, with mixed sex dyads being

least likely to split. The direction of sex differences in spacing behavior found in this study suggests the possibility that Knowles' results may have been, at least partially, due to the spacing preferences of dyads of different sex compositions rather than due to dyadic sex composition per se. In other words, the possibility arises that it is the closeness of the members of the dyads to one another which influences whether the dyads will choose to split to avoid an invader, or choose to side step the invader as a unit. Thus, a male dyad ambulating at, for example, an interpersonal distance of 10 inches may be just as impervious to invasion as a mixed sex dyad ambulating at the same interpersonal distance. A replication of Knowles' study, in which the interpersonal distances of the dyads previous to invasion are recorded, is suggested in order to explore this possibility.

In conclusion, the importance of the present study lies in the avenues it suggests for future research. This study has demonstrated that people communicate proxemically when they are moving as well as when they are stationary. The factors which may influence ambulatory proxemic behavior need to be explored. Additionally, the results from this study have shown that an aspect of the physical environment (size), can affect proxemic behavior in ways that do not relate to physical limitation factors. The phenomenological source of the ability of the size of a space to affect proxemic behavior and the resultant effects of proxemic behavior changes on other social processes could be fascinating areas of inquiry.

CHAPTER VII

NATURALISTIC OBSERVATION STUDY OF THE EFFECTS OF SEX COMPOSITION AND TYPE OF SETTING ON THE PROXEMIC BEHAVIORS OF DYADS ENGAGING IN SOCIAL INTERACTION

I. Introduction

The present study examined the effects of sex and setting on the distancing, orientation, and visual behaviors of dyads engaging in social interaction. In this study, the proxemic behaviors of 40 male, 40 female, and 40 mixed sex dyads were unobtrusively recorded at 10 second intervals as the dyads interacted within either an open space or a semi-fixed feature space.

This research was undertaken for a number of reasons. First, this research was conducted in order to gain more empirical information about sex differences in proxemic behaviors. Although a substantial number of studies have considered sex differences in proxemic behaviors (especially distancing behavior), the literature on this subject remains inadequate in two ways. One problem is that while a number of investigations have compared the proxemic behaviors of male and female dyads (e.g., Aeillo and Jones, 1971; Little, 1968; Russo, 1975), and a number of investigations have compared the proxemic behaviors of same sex and mixed sex dyads (e.g., Ashear and Snortum, 1971; Edwards, 1972, Patterson et al., 1971), very few studies have compared the proxemic behaviors of male, female, and mixed sex dyads simultaneously (e.g., Baxter, 1970; Jones, 1971). A second problem with research

on sex differences in proxemic behavior is that sex has generally remained a secondary variable, imbedded within other conditions. Consequently, the data produced by these studies have made it difficult to tease out the effects of sex from the effects of other factors such as degree of liking, status, age, etc. Altman (1975), in describing the current confusing state of the literature on sex differences in proxemic behavior, wrote:

> In spite of the volume of research, . . . sex differences have occupied a secondary place in personal space research. Most studies have not been primarily interested in sex differences per se but bow to the likelihood that they are important and imbed them within other conditions. Furthermore, these studies are so diverse in methodological approach and other variables that it is difficult to draw out any pervasive themes. Some authors compare the responses of males and females to various situations, some work with homogeneous sex pairs, some study mixed sex pairs, some blend in setting and age differences, and some work with sex and ethnic differences. The result is a fair degree of confusion. (p. 74)

The second reason for conducting this research is that the effects of setting on proxemic behavior remain largely undelineated. Only a few studies have considered the impact of setting on proxemic behavior, and virtually all of them employed either simulation or laboratory methodologies (e.g., Bass and Weinstein, 1971; Lewit and Joy, 1967; White, 1975). Furthermore, the variability in independent and dependent variables in those studies that are available precludes any substantial comparison of results, and consequently, any emergence of themes in setting effects. Also noteworthy is the complete absence of research comparing proxemic behaviors in open settings to proxemic behaviors in semi-fixed feature settings.

The third reason for this research is that the dynamics of the interrelationships among various modes of proxemic behavior are

not yet adequately understood. The interaction of proxemic behaviors in establishing various levels of immediacy with others requires simultaneous attention to different modes of proxemic behavior. However, most investigations in this area have focused on one nonverbal immediacy behavior to the exclusion of others. In particular, interpersonal distancing has typically been the sole proxemic behavior considered (e.g., Little, 1968; Kuethe, 1968; Tolor and Salafia, 1971; Willis, 1966). Few studies have considered two modes of proxemic behavior at one time (e.g., Coutts and Schneider, 1975; Goldberg, et al., 1969; Russo, 1975). Fewer studies still have examined three proxemic behaviors simultaneously (e.g., Aeillo, 1972; Beach and Sokoloff, 1974). In fact, perusal of the nineteen proxemic studies cited by Patterson (1973) in his review of the support for the immediacy system theory reveals that only two works (Watson and Graves, 1966; and Patterson, 1971) examined visual, distancing, and orientation behaviors simultaneously. This dearth of information on the interplay of different modes of proxemic behaviors reflects a continued lack of recognition that proxemic behaviors do not operate independently, but rather, operate as interrelated components in a system.

Moreover, those investigations which have considered multiple modes of proxemic behavior simultaneously have left some questions unanswered. For example, a number of studies have reported an association between greater interpersonal distances and greater amounts of looking behavior (e.g., Aeillo, 1972; Aeillo, 1977; Argyle and Dean, 1965; Coutts and Schneider, 1975; Russo, 1975).

However, each of these studies was conducted in the laboratory where the interpersonal distance between the interactants could be manipulated. It is not at all clear as to whether the association between greater interpersonal distances and greater amounts of looking behavior would hold up in the field where both distancing and visual behavior are allowed to vary freely. Additionally, the relationship between orientation and distancing behaviors requires further attention. Laboratory studies of the relationship between these two behaviors in adults have rather consistently indicated that closer interpersonal distances are associated with less direct orientations (e.g., Clore, 1969; Patterson, 1973a; Pellegrini and Empey, 1970). The problem with these studies is that the distancing and orientation behaviors of the subjects were recorded at only one point in time--at the onset of the interaction. It could well be the case that if these behaviors were recorded for the duration of the interaction, the relationship would weaken or disappear. Those studies which have considered distancing and orientation behaviors throughout interactions (e.g., Aeillo and Aeillo, 1972; Aeillo and Jones, 1971; Beach and Sokoloff, 1974; Jones, 1971) have generally employed juvenile subjects, and reported mixed results. Finally, more research is needed on the relationship between orientation behavior and visual behavior. Here, there have been investigations suggesting that more direct orientations are associated with less looking behavior (Patterson, 1973a; Watson and Graves, 1966), as well as investigations suggesting that more direct orientations are associated with more looking behavior (Beach and Sokoloff, 1974; Mehrabian, 1968a, 1968b).

Lastly, the present study was conducted because there is a general need for more ethological research of proxemic behavior. Illustrative of this need is Altman's (1975) report that only 12 percent of the 200 studies he reviewed concerning interpersonal distancing behavior were conducted in the field; and he concedes that a certain proportion of them were invasion studies. In view of this dearth of naturalistic observation research, it is no surprise that the amount of information concerning the ways people behave proxemically within non-constrained situations remains limited.

Hypotheses

There were a number of hypotheses for the present study. These hypotheses concerned five main areas: (a) sex differences in proxemic behavior, (b) the effects of setting on proxemic behavior, (c) the dynamic relationships among distancing, orientation, and visual behaviors, (d) the relationship between listening behavior and gaze direction, and (e) changes in proxemic behavior during the course of the interactions.

Hypotheses concerning the effects of dyadic sex composition. The sex composition of the dyad was expected to affect interpersonal distancing behavior, orientation behavior, visual behavior, and the lengths of the social interactions. With respect to interpersonal distancing behavior, it was predicted that mixed sex dyads would interact at the closest distances, followed by female dyads, with male dyads interacting at the greatest interpersonal distances. This prediction was based on laboratory, simulation, and field

investigations of standing and seated distancing preferences that have suggested that after puberty, mixed sex dyads prefer closer interpersonal distances than same sex dyads (e.g., Duke and Nowicki, 1972; Guardo, 1969; Meisels and Guardo, 1969) and that female dyads prefer closer interpersonal distances than male dyads (e.g., Aeillo and Jones, 1971; Baxter, 1970; Lerner, et al., 1975; Pellegrini and Empey, 1970).

Sex differences were expected to appear also with respect to the orientation behavior of the dyads. Specifically, it was hypothesized that female dyads would adopt more direct shoulder orientations than male dyads. The basis for expecting this sex effect in standing dyads comes from investigations conducted by Aeillo and Aeillo (1972), Jones (1971), and Jones and Aeillo (1973). Each of these investigations reported that female dyads assumed significantly more direct orientations than male dyads during standing social interactions. Investigations of sex differences in the orientation behavior of seated dyads have yielded less conclusive results. While Mehrabian and Friar (1969) and Pellegrini and Empey (1970) reported that females adopted more direct orientations than males within seated situations, Mehrabian (1968a, 1968b) and Beach and Sokoloff (1974) reported no sex differences in seated orientation choices. However, because more direct orientations have been associated with greater amounts of time spent in looking at coactors (Mehrabian, 1968a, 1968b), and because females tend to look at their coactors more than males (Exline, 1963; Libby, 1970), it was hypothesized that female dyads would adopt more direct orientations than male dyads in seated

interactions as well. Predictions about the orientation behavior of mixed sex dyads were more difficult to make because of the lack of studies comparing the orientation behaviors of male, female, and mixed sex dyads simultaneously. It seems probable, however, that since the literature indicates that adult mixed sex dyads prefer more immediacy than same sex dyads in the behavioral mode of interpersonal distancing, that mixed sex dyads would also prefer more immediacy than same sex dyads in the behavioral mode of orientation. Hence, it was tentatively hypothesized that mixed sex dyads will exhibit more direct shoulder orientations than either male or female dyads within both open and semi-fixed feature spaces.

Two hypotheses were made concerning sex differences in the visual behavior of the dyads. First, it was predicted that females would look at their coactors more than males would, regardless of the sex of the coactor. This expectation was based on investigations conducted by Exline (1963), Exline and Winters (1965), Exline, et al. (1965), Libby (1970), and Ashear and Snortum (1971). In each of these studies, it was found that females looked at their coactors more than males did, regardless of whether the coactor was a male or female. Secondly, it was predicted that same sex dyads would engage in more mutual facial regard than mixed sex dyads, and that female dyads would engage in more mutual facial regard than male dyads. This dyadic sex composition effect has been reported by Argyle and Dean (1965), Aeillo (1972), and Coutts and Schneider (1975). It is noteworthy that all of these investigations which reported sex differences in visual behavior involved seated dyads. However, inasmuch

as investigations of sex differences in visual behavior have been marked by a "remarkable consistency of findings" (Duncan, 1969, p. 336), it was hypothesized that these sex differences are sufficiently salient to emerge regardless of whether the interaction occurs within a semi-fixed feature or informal space.

Finally, sex differences were expected to appear with respect to the lengths of the social interactions. Here, it was hypothesized that female dyads would engage in longer social interactions than either male or mixed sex dyads. This sex effect was expected because a number of researchers (e.g., Aeillo, 1972; Argyle and Dean, 1965; Mehrabian, 1971) have suggested that females are more immediate in their proxemic behavior than males because females tend to be more affiliative than males (Anastasi, 1958). If this is the case, it is likely that females would manifest their greater affiliative tendencies also by engaging in interactions of longer durations.

Hypotheses concerning the effects of setting. Because of the exploratory nature of this research, hypotheses concerning the effects of environment on proxemic behavior lacked empirical underpinnings. However, it was hypothesized that dyads engaging in seated interactions within semi-fixed feature spaces would exhibit more immediate proxemic behavior than dyads engaging in standing interactions within open spaces. That is, it was predicted that dyads within semi-fixed feature spaces would (a) assume closer interpersonal distances, (b) adopt more direct orientations, and (c) engage in more facial regard and mutual facial regard. Moreover, it was expected that dyads within semi-fixed feature spaces would engage in longer interactions

than dyads within open spaces. These hypotheses were based on the notion that by sitting down together, the members of the dyad were making a "commitment" to interact with one another, and that those who were willing to make such a commitment were likely to be anticipating a pleasant social interaction, more attracted to one another, and/or better acquainted with one another than those who engaged in standing interactions. If one or more of these social factors were in fact operative in the dyads' decisions to engage in seated interactions, the proxemic behavior of these dyads would be expected to be more immediate because proxemic behaviors tend to be more immediate (a) when the nature of the interaction is positive, rather than neutral or negative (e.g., Ellsworth and Carlsmith, 1968; Exline, et al., 1965; Haase and Pepper, 1972; Kelly, 1972), (b) when the coactors are attracted to one another (e.g., Campbell, Kruskal, and Wallace, 1966; Guardo, 1969; Jourard and Friedman, 1970; Powell and Dabbs, 1976), and (c) when the coactors are friends rather than acquaintances or strangers (e.g., Heshka and Nelson, 1972; Little, 1965; Russo, 1975; Willis, 1966).

Hypotheses concerning the interrelationships among distancing, orientation, and visual behavior. Three hypotheses were made concerning the dynamic interrelationships among interpersonal distancing behavior, orientation behavior, and visual behavior. First, on the basis of the Immediacy System Theory, it was hypothesized that interpersonal distances and looking behavior would be related to one another such that greater interpersonal distances would occur when there was mutual facial regard than when there was not mutual facial regard.

This prediction was based on laboratory investigations in which researchers examined the effects of interpersonal distancing manipulations on the visual behavior of seated dyads. Aeillo (1972), Aeillo (1977), Argyle and Dean (1965), Coutts and Schneider (1975), and Russo (1975) have all reported that under these conditions, looking behavior increases as seated interpersonal distance is increased. The present study sought to determine whether this relationship between distancing behavior and visual behavior appears in standing dyads as well as seated dyads, and whether this relationship holds up in field situations in which both distancing and visual behavior are under the control of the coactors.

Secondly, again on the basis of the Immediacy System Theory, it was hypothesized that closer interpersonal distances would be associated with less direct shoulder orientations. Laboratory studies conducted by Clore (1969), Patterson (1973a), and Pellegrini and Empey (1970), have indicated that when people approach others in order to engage in social interactions, closer interpersonal distances tend to be associated with less direct orientations. However, investigations which tested this relationship for the duration of social interactions have generally focused on the behavior of children and have produced contradictory results (e.g., Aeillo, 1972; Aeillo and Jones, 1971; Beach and Sokoloff, 1974). Consequently, it was a purpose of the present study to ascertain whether closer interpersonal distances continue to be associated with less direct orientations throughout adult social interactions which occur in the field.

Thirdly, it was hypothesized that more direct shoulder orientations would be associated with greater amounts of

looking behavior. The Immediacy System Theory predicts that interactants would tend to look at each other less as shoulder orientation becomes more direct in order to compensate for the greater degree of body accessibility that is afforded by a more direct orientation. However, investigations of the relationship between these two proxemic behaviors have produced contradictory results. Patterson (1973a) and Watson (1966) have reported that people tend to look at their coactors less as shoulder orientations become more direct, while Beach and Sokoloff (1974) and Mehrabian (1968a, 1968b) have reported that people tend to look at their coactors more as shoulder orientations become more direct. Given these mixed findings, the present hypothesis that more direct orientations would be associated with more looking behavior (and, conversely, that less direct shoulder orientations would be associated with less looking behavior) was based largely on the reasoning that it is physically uncomfortable to look in one direction while being oriented in another direction. Consequently, in field situations, in which the coactors have control of all of their proxemic behaviors, it seems more probable that coactors would compensate for more direct orientations, not through the visual mode, but rather through another mode (such as distancing) which does not entail physical discomfort.

Hypotheses concerning the relationship between looking behavior and listening behavior. The present study also examined the relationship between looking behavior and listening behavior. A number of laboratory researchers have reported that listeners look at their coactors more than speakers do (e.g., Argyle, 1975; Argyle and Dean,

1965; Day, 1964; Kendon, 1964; Patterson, 1973b). On the basis of these studies, it was predicted that listening behavior would be associated with greater amounts of looking behavior regardless of the sex composition of the dyad, and regardless of the type of setting in which the dyad interacted.

Hypotheses concerning changes in proxemic behaviors over the course of the interactions. Finally, the present study allowed for the examination of changes in distancing, orientation, and visual behaviors over the course of the social interactions. Here, it was predicted that the terminations of interactions would be marked by a decrease in interpersonal involvement which would manifest itself through increases in distance, reductions of looking behavior, and adoptions of less direct orientations. Comparisons of proxemic behaviors at the first, middle, and last coding periods of the interactions were also made; however, there were no specific hypotheses generated concerning this area of inquiry.

Table VII-1 contains a summary of the hypotheses for the present study.

II. Methods

The present study employed a multivariate time sampling technique in which two female observers unobtrusively recorded the distancing behaviors, orientation behaviors, visual behaviors, and speaking behaviors of interacting dyads at 10 second intervals. The data for the study were collected from September 1978 through February 1979 at two locations on the campus of the University of Tennessee, Knoxville.

TABLE VII-1

SUMMARY OF HYPOTHESES

Hypotheses Concerning Sex Effects

1) Mixed sex dyads will interact at the closest interpersonal distances, followed by female dyads, with male dyads interacting at the greatest interpersonal distances.

2) Mixed sex dyads will adopt the most direct shoulder orientations, followed by female dyads, with male dyads adopting the least direct shoulder orientations.

3) Females will look at their coactors more than males, regardless of the sex of the coactor.

4) Female dyads will engage in the greatest amount of mutual facial regard, followed by male dyads, with mixed sex dyads engaging in the smallest amount of mutual facial regard.

5) Female dyads will engage in longer social interactions than either male dyads or mixed sex dyads.

Hypotheses Concerning Setting Effects

1) Dyads within the semi-fixed feature space will interact at closer interpersonal distances than dyads within the open space.

2) Dyads within the semi-fixed feature space will adopt more direct shoulder orientations than dyads within the open space.

3) Dyads within the semi-fixed feature space will engage in greater amounts of facial regard than dyads within the open space.

4) Dyads within the semi-fixed feature space will engage in greater amounts of mutual facial regard than dyads within the open space.

5) Dyads within the semi-fixed feature space will engage in longer social interactions than dyads within the open space.

TABLE VII-1 (Continued)

Hypotheses Concerning the Interrelationships Among Proxemic Behaviors

1) Greater interpersonal distances will occur when there is mutual facial regard than when there is no mutual facial regard.

2) Closer interpersonal distances will be associated with less direct shoulder orientations.

3) More direct shoulder orientations will occur when there is mutual facial regard than when there is no mutual facial regard.

Hypothesis Concerning the Relationship Between Listening Behavior and Looking Behavior

1) Listening behavior will be associated with greater amounts of looking behavior, regardless of the sex composition of the dyad or the setting in which the dyad is interacting.

Hypotheses Concerning Changes in Proxemic Behaviors Over the Course of the Interactions

1) The terminations of social interactions will be marked by increases in interpersonal distances.

2) The terminations of social interactions will be marked by the adoption of less direct shoulder orientations.

3) The terminations of social interactions will be marked by reductions of looking behavior.

Subjects

Subjects for the study were 40 male, 40 female, and 40 mixed sex dyads observed while interacting within either a semi-fixed feature space or an informal space. As in the first study, several criteria had to be met in order for the dyad to be deemed eligible for observation. First, non-Whites and those appearing to be from non-American cultures (as judged by their dress and language) were not included in the sample. This stipulation was imposed in order to control for differences in proxemic behavior due to racial and cultural factors such as those reported by Hall (1968), Jones (1972), and Watson and Graves (1966). If the racial and/or cultural background of a dyad member was considered questionable, the dyad was not coded. Secondly, people wearing name tags and badges were likewise excluded from observation under the assumption that they were more likely to be visitors to the University of Tennessee, and not members of the target population of University students, faculty and staff. Thirdly, those with obvious physical stigmas were also exempt from observation because stigmatization can affect both interpersonal distancing (Lerner, et al., 1975) and visual behavior (Goffman, 1963). Finally, dyads were omitted from the study if the members were holding hands, arm in arm, or otherwise engaging in continuous physical contact. This rule was imposed because touching is a very salient proxemic behavior (e.g., Hall, 1968; Jourard, 1966), and as such, must be controlled for in a study of the interrelationships of other proxemic behaviors.

Prestudies

As in the first study, prestudies were undertaken in order to ascertain the demographic characteristics of the population under investigation. The age, sex, and status (student, faculty, or staff) of 200 users of the settings under investigation were obtained through a survey taken by the observers. The vast majority of the population (93 percent) was composed of students. Ninety-four percent of those surveyed were between the ages of 18 and 29. Forty-eight percent of the users of the settings were female, 52 percent were male. Ninety-three percent of the 240 subjects observed in the actual study were judged as students between the ages of 18 and 29.

Independent Variables

There were two independent variables in the second study. The first independent variable was the sex composition of the dyad under observation. All possible sex combinations were included: male-male, female-female, and male-female.

The second independent variable was the type of setting in which the dyadic interactions took place. One of these settings was, in Hall's (1968) terms, an open interior space. Open spaces are characterized by an absence of partitions, furniture, and other physical objects which can impede free use of proxemic behaviors during interaction. Those interacting in such spaces are, per force, standing. A large foyer (approximately 37 ½ feet by 40 feet) in the University Student Center served as the open space setting because it contained no furniture except for one couch where the observers sat. The second type of setting was what Hall (1968) termed

as a semi-fixed feature space. This kind of setting is characterized by furniture such as tables and chairs which can be repositioned if desired (hence the expression semi-fixed feature). Those interacting within this type of setting are virtually always sitting. A campus lounge measuring approximately 34 feet by 47 feet served as the semi-fixed feature space. Figures VII-1 and VII-2 contain photographs of the two settings in which the data were collected.

Dependent Variables

The observers recorded four behaviors of the dyads, at 10 second intervals, as they interacted. First, the distance between the interactants was recorded. The interpersonal distance was operationally defined as the distance, in inches, between the interactants' heads. Many studies have defined interpersonal distance as the distance between the parts of the interactants' bodies closest to the other (e.g., Aeillo, 1972; Goldberg, et al., 1969; Russo, 1975). However, in these studies, the body orientations of the subjects were held constant. Similarly, other studies have defined interpersonal distance as the nose to nose distance between the interactants (e.g., Baxter, 1970). But in these studies, the head orientations were held constant. Given the lack of control over orientation behavior during naturalistic observation, it was considered that head to head distances would be least likely to yield artificial variation in interpersonal distancing measures due to changes in body or head orientation.

The second dependent measure was the orientation adopted by the dyads during the interactions. Orientation was defined as the

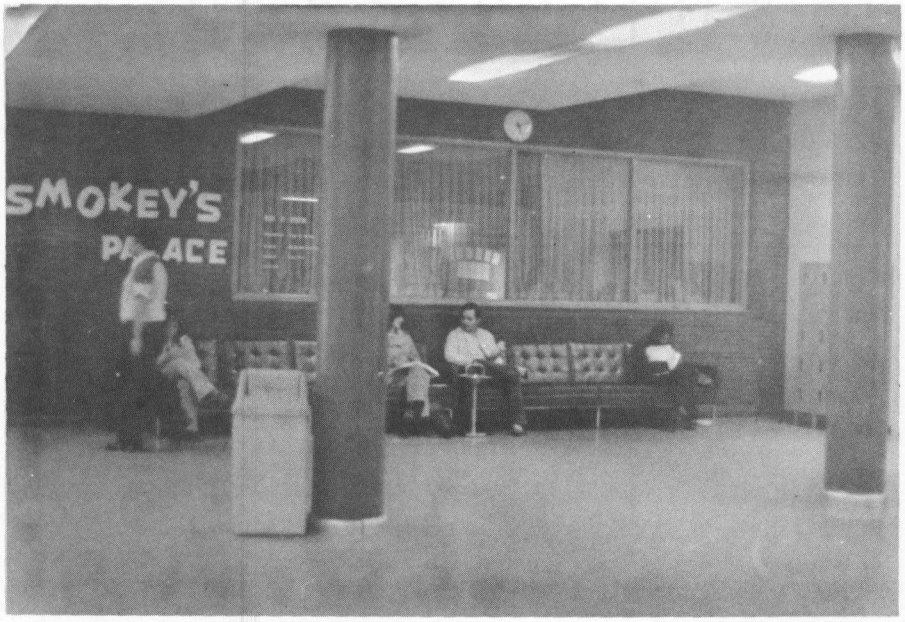

Figure VII-1. Photograph of the open setting.

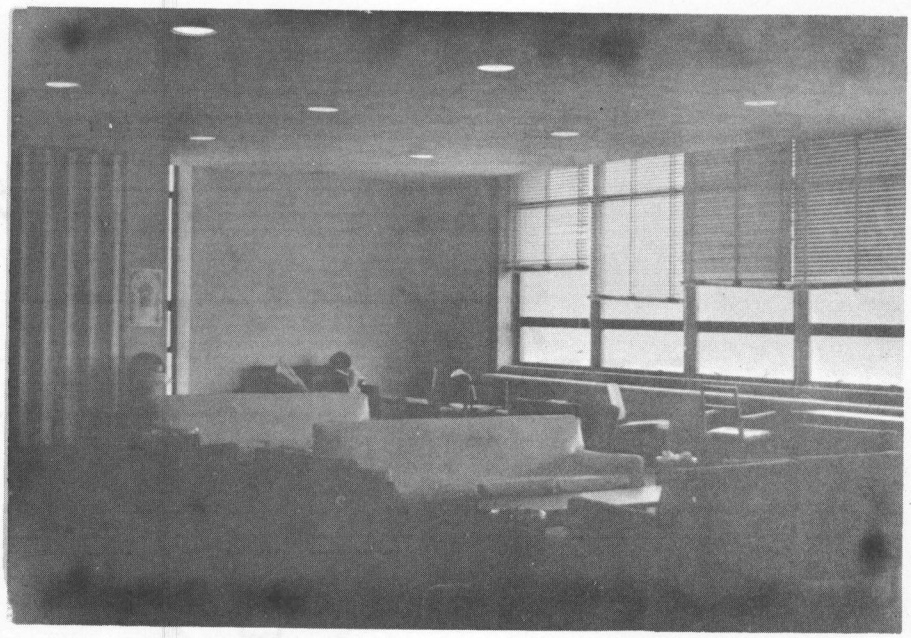

Figure VII-2. Photograph of the semi-fixed feature setting.

angle formed by the interactants' shoulders. The coding system for this behavior was adapted from Hall's categories (1963, 1971). Specifically, a coding of "1" corresponded to a head on orientation in which the lines formed by the shoulders were parallel (or 0 degrees), "2" denoted an orientation of 45 degrees, "3" denoted a 90 degree orientation, "4" denoted an angle of 135 degrees, and "5" corresponded to a 180 degree orientation in which the interactants were standing side by side. Although Hall's system for the notation of orientation behavior allows for the coding of shoulder axes greater than 180 degrees, literature on the orientation behavior of interacting dyads (e.g., Forston and Larson, 1968; Mehrabian, 1968a, 1968b) indicated that orientations less direct than 180 degrees rarely, if ever, occur during social interaction. Pilot studies also suggested that a five category notation system would prove adequate. The raters were nevertheless instructed to specially record orientations less direct than 180 degrees. However, no such orientations occurred during the actual data collection.

Thirdly, the visual behavior of both interactants was also recorded. Rather than recording simply the presence or absence of eye contact, the eye behavior of each coactor was recorded separately, but simultaneously. For every observation period, the visual behavior of each coactor was coded as either "1" or "0", with "1" denoting looking at the other's face or eyes, and "0" denoting looking elsewhere. The possible coding combinations for interactants A and B were 1-0, 0-1, 1-1, 0-0. These codes translated into situations in which A was looking at B, while B was looking elsewhere; B was looking at A, while A was looking elsewhere; A and B were looking at

each other simultaneously (i.e., mutual facial regard); and neither A nor B was looking at the other, respectively. This behavior category system allowed for the precise recording of all possible visual behavior situations within the dyads. Additionally, this system also made it possible to perceive sex differences in eye behavior within mixed sex dyads.

Finally, the observers also noted which interactant was speaking during each of the observation periods. This measure was taken because a number of studies have indicated that listeners look at speakers more than speakers look at listeners (e.g., Argyle and Dean, 1965; Exline, et al., 1965; Kendon, 1972; Nielson, 1972).

In addition to the four dependent measures which were taken at each 10 second interval, three additional measures were taken once for each dyadic interaction. First, the length of each social interaction was noted. Secondly, the location of the interactants within the space was recorded. Finally, in the case of interactions within the semi-fixed feature space, the angles of the seats on which the coactors sat were noted.

Procedure

The data were collected by two trained observers who unobtrusively recorded the interpersonal distances, orientations, visual behaviors, and speaking behaviors of 120 dyads as they engaged in social interactions within semi-fixed feature or open spaces. The decision to naturalistically observe dyadic interactions was based on a recognized need for greater emphasis on field research in the study of proxemic behavior (Altman, 1975), and for "controlled

observation" of the dynamics of these behaviors as they occur within dyads of individuals (Watson, 1966, pp. 234-235).

The time sampling technique. A multivariate time sampling technique was employed in this study. Two observers, using a specified behavior category system, recorded the behaviors of interacting dyads at 10 second intervals. The literature in the area suggests that 10 second intervals are optimal time units for the live observation of proxemic behaviors. For example, Watson (1966) and Aeillo (Aeillo and Jones, 1973) employed 30 second and 20 second intervals, respectively, in their earlier multivariate time sampling technique studies. However, both researchers reduced the observation intervals to 10 seconds in subsequent studies (Watson, 1966; Aeillo and Aeillo, 1974). The present study included a total of 1269 observations of the proxemic behaviors of interacting dyads.

The behavior category system. The observers recorded a number of behaviors at each 10 second interval. First, the head to head distance between the interactants was recorded. Secondly, the shoulder orientation adopted by the dyad was noted. Thirdly, the gaze direction of each of the interactants was recorded. Finally, the observers noted which interactant was speaking at each coding point. In addition to these behavioral measures, the observers also recorded the temporal length of the interaction, the location of the interactants within the space, and, if the interaction occurred within the semi-fixed feature space, the angles of the couches and/or chairs on which the interactants sat. Appendix B contains a copy of the behavior category coding sheets used by the observers.

Situational criteria for observation. The first criterion for the coding of any dyadic interaction concerned the density level in the space at the time of the observation. Observations could not be taken during extremely high or low density periods. The potential effects of density were controlled largely by avoiding high density periods (11:30 A.M. to 1:30 P.M.) and low density periods (4:00 P.M. to 8:00 A.M.). Density factors were further controlled in the open space by the stipulation that the observers had to be able to clearly see all of the proxemic behaviors of the dyads. Consequently, if a dyad was interacting during any brief period of high density, passersby would obstruct their vision, and the observation of the dyad would be omitted from the final data pool on the grounds of its incompleteness. The potentially confounding effects of high density levels in the semi-fixed feature space were avoided through a stipulation that at least 30 percent of the seats in the space had to be unoccupied. A second criterion for observation was that both members of the dyad had to meet the eligibility requirements delineated in the "Subjects" section of this study. Thirdly, no third party was allowed to interrupt the dyad's interaction for any amount of time. If such an interruption occurred, the data from the dyad's interaction were omitted from the final sample. Finally, as was mentioned above, both observers had to be able to clearly see the behaviors of the interacting dyad.

Procedure for observation. In order to unobtrusively observe the proxemic behaviors of the interacting dyads, the observers located themselves side by side either on a bench (in the open space), or

on a couch or adjacent chairs (in the semi-fixed feature space). Generally, the observers were seated against a wall in order to minimize the chances that their coding behavior would be noticed by users of the space.

The observers began recording the proxemic behaviors of each dyad at the beginning of their social interaction, and continued to record their behaviors at 10 second intervals until the interaction was over. The onset of an interaction was operationally defined as the point at which one member of the dyad was speaking to the other, in conjunction with the point at which the members of the dyad had stopped moving toward one another (within the open space) or both members were seated (within the semi-fixed feature space). The termination of an interaction was defined as two contingent periods (20 seconds) in which neither member of the dyad looked at or spoke to the other. The coding period immediately preceding these two periods was considered the last observation point for the interaction.

The observers were trained to avoid looking at the dyads when they were not actually recording the behavior of the dyads. That is, during the periods between coding points, one observer measured the passage of time on her watch, while the other observer looked down at her coding sheet. At each 10 second interval, the observer who was timing the intervals would say "Code," at which point both observers would glance at the dyad for approximately 1 second, record the behaviors, and continue to look down until the next observation period. This methodology was employed because the proxemic behaviors of the dyads were continually changing. By not looking at the dyads

during non-coding periods, the observers were able to avoid the distractions posed by the interactants' behaviors during the non-coding periods.

During the actual data collection, the observational responsibilities of the coders were split such that one coder observed the interactants' interpersonal distances and shoulder orientations while the other coder observed the visual behaviors and speaking behaviors of the interactants. Pilot work indicated that this division of responsibilities enhanced inter-observer agreement because one observer focused her attention on the head and shoulders of the coactors while the other observer focused her attention on the faces of the coactors.

Observer training and inter-observer agreement. Two female undergraduates were employed as observers for this study. Females were selected as observers because J. R. Aeillo (1972) and Judith Hall (1978) have suggested that females are more attuned to the nonverbal behavior of others than males. Both observers received academic credit for their participation.

The training of the observers was accomplished in two phases. In the first phase of training, the observers viewed "staged" social interactions within the laboratory. Male, female, and mixed sex pairs of associates of the researcher were asked to engage in both seated and standing conversations for the benefit of the observers' training. As the dyads interacted, the researcher would say "Code" at periodic intervals. At these points, the observers would record the behaviors of the coactors; and simultaneously, the coactors would

"freeze" their behaviors. The interpersonal distance between the coactors and their shoulder orientation were then physically measured, and the coactors were asked about their gaze directions and speaking behaviors at the coding point. By employing this technique, it was possible for the observers to receive immediate feedback on the accuracy of their behavior recordings.

Originally, it had been expected that each of the observers would be able to record all five of the behaviors, and thus collect data individually. However, conversations with the observers indicated that this was too great a task, and that the observational responsibilities would have to be divided in order to attain satisfactory inter-observer agreement levels. After brief experimentation, it became apparent that inter-observer agreement markedly improved when both observers focused on either distancing and orientation behaviors, or visual and speaking behaviors. After a total of three weeks of training, inter-observer agreement was tested for male, female, and mixed sex dyads within both standing and seated situations within the laboratory. Analyses of the observers' behavior recordings revealed that inter-observer agreement had reached statistically significant levels in all conditions. Pearson product moment correlations yielded correlations between .89 and .96 for the observers' recordings of interpersonal distancing behavior. Pearson product moment correlations for the observers' recordings of shoulder orientations yielded correlations ranging from .84 to .93. The observers agreed on 95.8 percent of the trials on whether or not coactor A was looking at the face of coactor B. The observers

agreed on 96.3 percent of the trials on whether or not coactor B was looking at the face of coactor A. On 97.7 percent of the trials, the observers agreed on who was speaking during the observation periods.

In the second phase of the observer training, the observers recorded the proxemic behaviors of male, female, and mixed sex dyads within the two field settings. Inter-observer agreement remained at significant levels for all behaviors with the exception of gaze direction, which dropped slightly below significance levels for the first 12 dyadic interactions. However, when the data from a second set of 12 dyadic interactions were analyzed, inter-observer agreements were significant for all behaviors. It was only at this point that actual data collection was allowed to begin with one observer recording distancing and orientation behaviors and the other observer recording visual and speaking behaviors.

III. Results

Analyses

In order to test the hypotheses of the study, the data were analyzed from five main perspectives. First, in order to determine the effects of both dyadic sex composition and setting on the behavior of the dyads, a 2 x 3 multivariate analysis of variance was performed. The independent variables for this analysis were setting (semi-fixed feature and open) and dyadic sex composition (male, female, and mixed sex). The dependent variables were (a) interpersonal distance, (b) shoulder orientation, (c) percent of time spent in mutual facial regard, and (d) length of interaction.

Secondly, analyses were performed to test the Immediacy System Theory's predictions concerning the dynamic interrelationships among proxemic behaviors. Specifically, three different tests were imposed on the data. First, a Spearman rank order correlation (rho) was performed to test the relationship between interpersonal distancing and orientation behaviors. Secondly, in order to test the relationship between mutual facial regard and orientation behavior, an analysis of variance was performed which compared the orientation scores occurring when there was mutual facial regard to the orientation scores occurring when there was no mutual facial regard. The third test of the Immediacy System Theory was another analysis of variance which was performed to ascertain the relationship between mutual facial regard and interpersonal distancing behavior. Here, the distance scores occurring during periods of mutual facial regard were compared to the distance scores occurring when there was no mutual facial regard.

A third set of analyses were performed on the data in order to test hypotheses concerning the relationship between listening behavior and looking behavior. Two by two chi square statistical tests were imposed on the data. The chi square tests cross-tabulated whether the subject was speaking or listening against whether the subject was looking at or away from the coactor.

Fourthly, the data were analyzed in terms of changes in proxemic behavior over time. Here, changes in interpersonal distance, orientation, and visual behavior were examined over the course of each social interaction. Distance and orientation scores were compared across the first, middle, and last code of each interaction by means of one

way analyses of variance. Differences in the number of dyads engaging in mutual facial regard during the first, middle, and last code were investigated through chi square analyses. Lastly, proxemic behavior changes cueing the termination of social interactions were investigated by examining the last change in distancing, orientation, and visual behavior.

Finally, patterns were sought in both the location choices for interaction and the seating choices of interactants within the semi-fixed feature space.

The following presentation of results reflects the five different perspectives from which the data were analyzed. First, the effects of setting, sex, and setting by sex are presented. Secondly, the results of the tests of the dynamic relationships among proxemic behaviors are discussed. Thirdly, the results from the analyses concerning the relationship between listening behavior and looking behavior are presented. Fourthly, patterns which appeared with respect to changes in proxemic behavior over the course of the social interactions are presented. Finally, patterns concerning interaction location choices in the open and semi-fixed feature spaces and seating choices within the semi-fixed feature space are discussed.

The Effects of Setting on the Behavior of Interacting Dyads

Interpersonal distancing. As Figure VII-3 illustrates, the univariate analysis of variance revealed a highly significant main effect for setting on the interpersonal distancing behavior of the dyads ($p < .0001$). Standing dyads interacting within the open

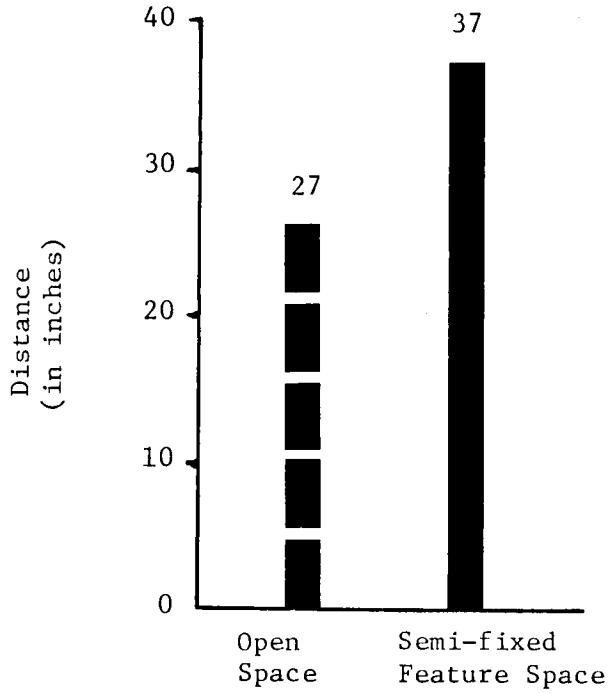

Figure VII-3. The effects of setting on interpersonal distance. ($F = 334.53$, $df = 1/1263$, $p < .0001$).

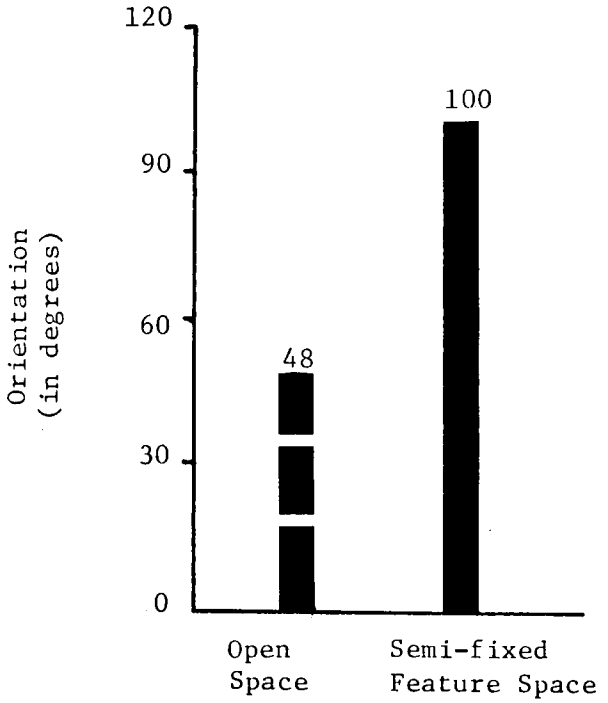

Figure VII-4. The effects of setting on shoulder orientation. ($F = 453.83$, $df = 1/1263$, $p < .0001$).

space displayed significantly closer interpersonal distances than seated dyads interacting within the semi-fixed feature space. Standing dyads had an average interpersonal distance of 27 inches, while seated dyads had an average interpersonal distance of 37 inches.

Shoulder orientation. The shoulder orientations adopted by the interacting dyads were also significantly affected by setting. Figure VII-4 depicts the finding that shoulder orientations were significantly more direct for standing dyads than for seated dyads ($p < .0001$). Standing dyads interacting within the open space assumed an average shoulder orientation of 48 degrees, while dyads seated within the semi-fixed feature space assumed an average shoulder orientation of 100 degrees. It should be noted here that within the semi-fixed feature space, there was no correlation between average shoulder orientations and the angles of the seats on which the interactants sat.

Visual behavior. Figure VII-5 presents the effect of setting on the percent of time the dyads engaged in mutual facial regard. Dyads within the open space engaged in significantly more mutual facial regard than dyads within the semi-fixed feature space. The mean percent of mutual facial regard for standing dyads was 65 percent, compared to a mean of 51 percent for seated dyads. This difference was statistically significant beyond the .0009 level.

There was also significantly more facial regard (as opposed to mutual facial regard) in the open space than in the semi-fixed feature space ($p < .001$). In the open space coactor A looked at

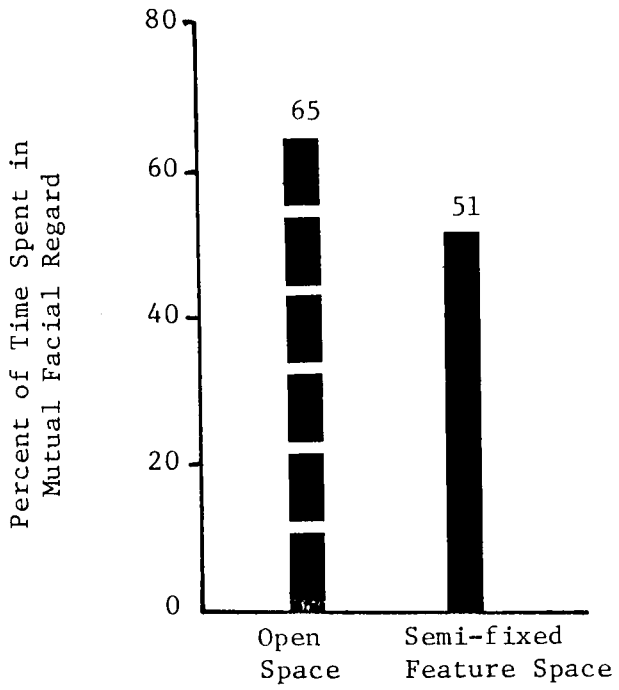

Figure VII-5. The effects of setting on percent of time spent in mutual facial regard. ($F = 7.14$, $df = 1/114$, $p < .0086$)

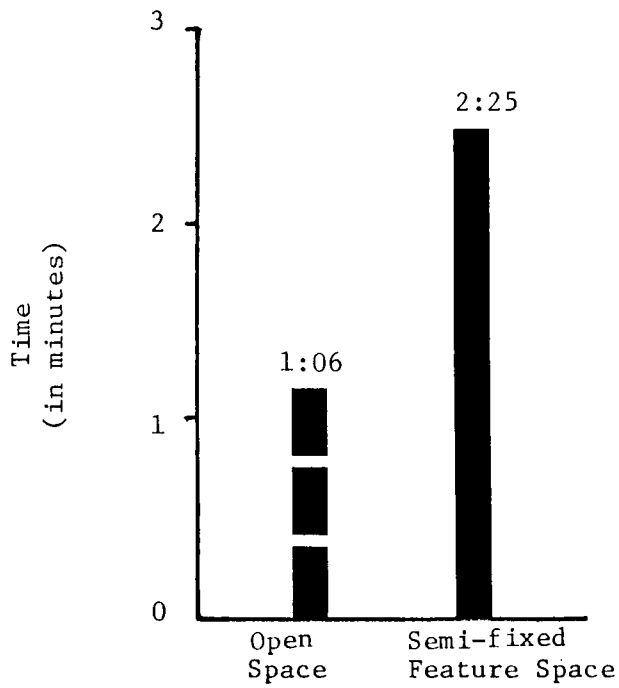

Figure VII-6. The effects of setting on the lengths of the social interactions. ($F = 17.42$, $df = 1/114$, $p < .0001$)

coactor B 78 percent of the time, while coactor B looked at coactor A 79 percent of the time. In the semi-fixed feature space, coactor A looked at coactor B 68 percent of the time, while coactor B looked at coactor A 71 percent of the time (χ^2 = 11.036, 1 df, $p < .001$).

Length of interaction. A significant main effect for setting emerged also with respect to the lengths of the interactions. The average duration of interactions taking place within the open space was 1 minute, 6 seconds; the average duration of interactions taking place within the semi-fixed feature space was 2 minutes, 25 seconds (see Figure VII-6). The effect of setting on interaction length was statistically significant beyond the .0001 level.

The Effects of Dyadic Sex Composition on the Behavior of Interacting Dyads

Interpersonal distancing. There was a strong effect for dyadic sex composition on the interpersonal distancing behavior of the dyads. As Figure VII-7 illustrates, male dyads interacted at the greatest interpersonal distances ($\overline{X}$ = 37 inches), mixed sex dyads interacted at intermediate distances ($\overline{X}$ = 35 inches), and female dyads interacted at the closest interpersonal distances ($\overline{X}$ = 31 inches). The effect was statistically significant beyond the .0001 level.

Shoulder orientation. Figure VII-8 presents the main effect for dyadic sex composition on the orientation behavior of the dyads. Mixed sex dyads adopted the most direct orientations ($\overline{X}$ = 79 degrees), followed by male dyads ($\overline{X}$ = 82 degrees), with female dyads adopting

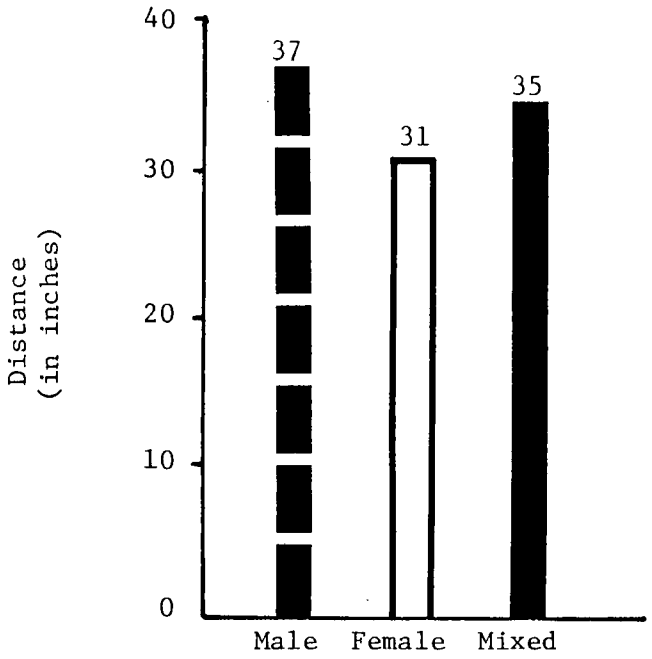

Figure VII-7. The effects of dyadic sex composition on interpersonal distance. ($F = 38.11$, $df = 2/1263$, $p < .0001$)

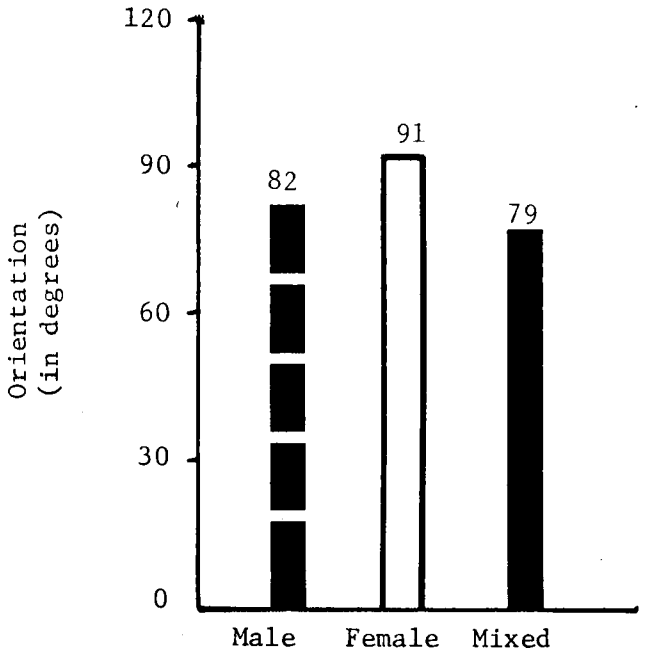

Figure VII-8. The effects of dyadic sex composition on shoulder orientation. ($F = 38.11$, $df = 2/1263$, $p < .0001$)

the least direct orientations ($\bar{X}$ = 91 degrees). The influence of dyadic sex composition on shoulder orientation was significant beyond the .0001 level.

Visual behavior. The sex composition of the interacting dyad did not significantly affect the percent of time the dyad engaged in mutual facial regard. Female dyads, however, engaged in somewhat more mutual facial regard than either male dyads or mixed sex dyads. Figure VII-9 shows that female dyads were coded as engaging in mutual facial regard an average of 65 percent of the observation periods, compared to an average of 55 percent for both male and mixed sex dyads.

With respect to sex differences in amounts of facial regard, females looked at their coactors, regardless of the coactor's sex, an average of 76 percent of the time. Males looked at their coactors, regardless of the coactor's sex, an average of 68 percent of the time. This sex difference was significant at the .05 level (χ^2 = 4.036, 1df).

Length of interaction. Dyadic sex composition did not significantly affect the lengths of the social interactions observed. Mixed sex dyads engaged in somewhat shorter interactions ($\bar{X}$ = 1:32) than either female dyads ($\bar{X}$ = 1:54) or male dyads ($\bar{X}$ = 1:51). Figure VII-10 represents the effects of dyadic sex composition on the lengths of interactions.

Sex by Setting Effects

Interpersonal distancing. The analyses revealed a significant sex by setting interaction effect on the interpersonal distances

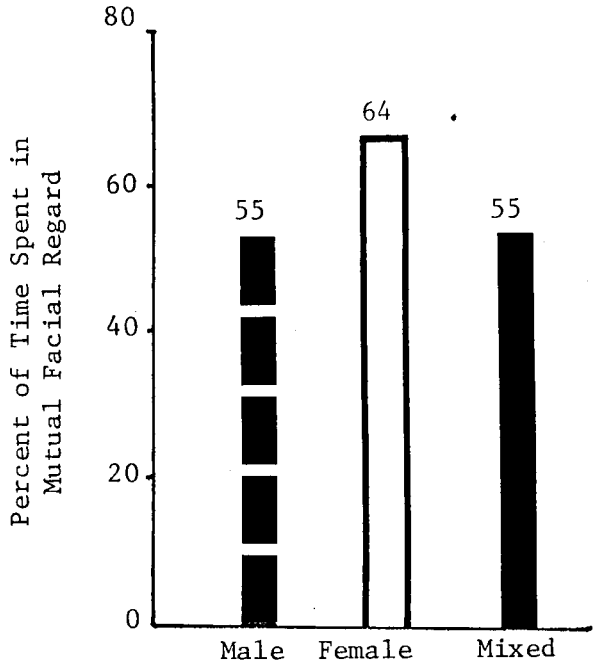

Figure VII-9. The effects of dyadic sex composition on percent of time spent in mutual facial regard. (F = 1.41, df = 2/114, not significant)

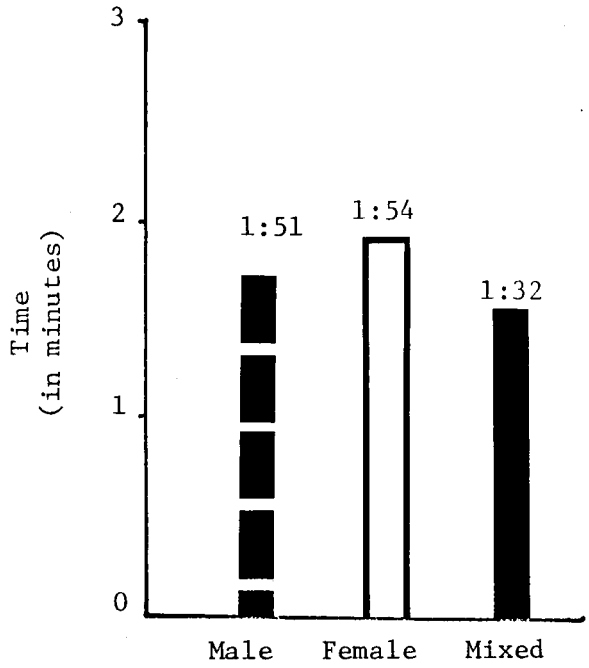

Figure VII-10. The effects of dyadic sex composition on the lengths of the social interactions. (F = 0.54, df = 2/114, not significant)

adopted by the dyads ($p < .0001$). As Figure VII-11 illustrates, the average distances for male dyads, female dyads, and mixed sex dyads interacting within the semi-fixed feature space were 42 inches, 33 inches, and 38 inches respectively. Within the open space, male dyads, female dyads, and mixed sex dyads had distance averages of 25 inches, 27 inches, and 28 inches respectively.

Shoulder orientation. Figure VII-12 presents the significant sex by setting interaction which appeared with respect to the shoulder orientations adopted by the dyads. Within the semi-fixed feature space, male dyads, female dyads, and mixed sex dyads had average shoulder orientations of 91 degrees, 114 degrees, and 95 degrees respectively. The average orientations for male, female, and mixed sex dyads within the open space were 59 degrees, 44 degrees, and 43 degrees respectively.

Mutual facial regard. The interaction effects of sex and setting on the percent of time spent in mutual facial regard were not statistically significant. As Figure VII-13 illustrates, the average percentages of time spent in mutual facial regard by male, female, and mixed sex dyads within the open space were 57 percent, 73 percent, and 66 percent respectively. The respective percentages of time spent in mutual facial regard by male, female, and mixed sex dyads within the semi-fixed feature space were 54 percent, 56 percent, and 44 percent.

Length of interaction. Sex by setting effects on the lengths of interactions also failed to reach significance. Figure VII-14 shows that within the semi-fixed feature space, male dyads interacted

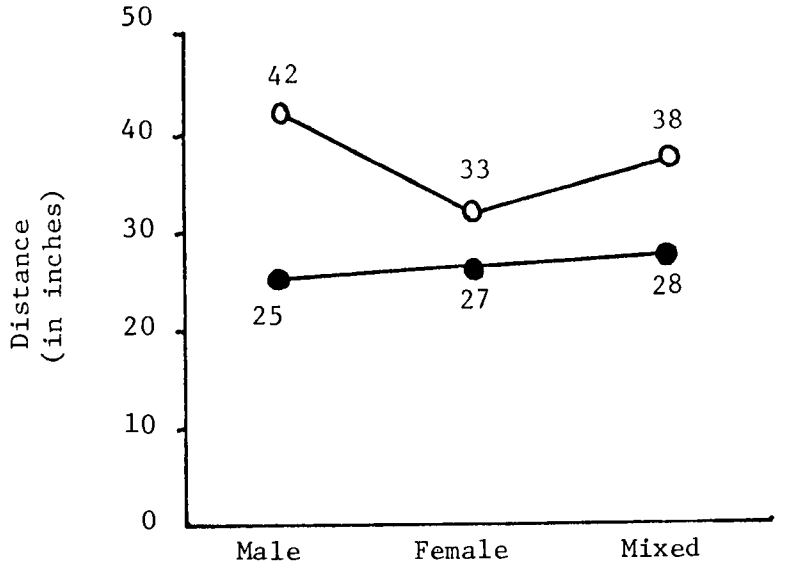

Figure VII-11. The interaction effects of dyadic sex composition and setting on interpersonal distance. O = Semi-fixed feature space; ● = Open space. (F = 27.12, df = 2/1263, p <.0001

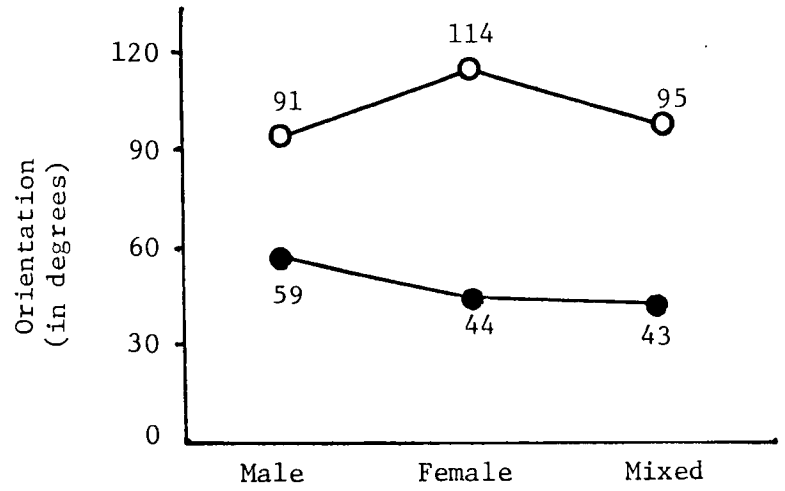

Figure VII-12. The interaction effects of dyadic sex composition and setting on shoulder orientation. O = Semi-fixed feature space; ● = Open space. (F = 24.42, df = 2/1263, p <.0001)

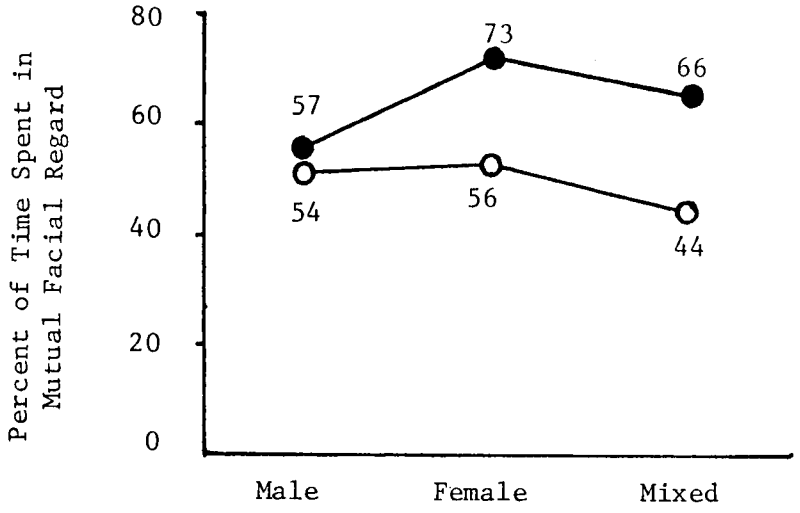

Figure VII-13. The interaction effects of dyadic sex composition and setting on the percent of time spent in mutual facial regard. ○ = Semi-fixed feature space, ● = Open space. (F = 1.07, df = 2/114, not significant)

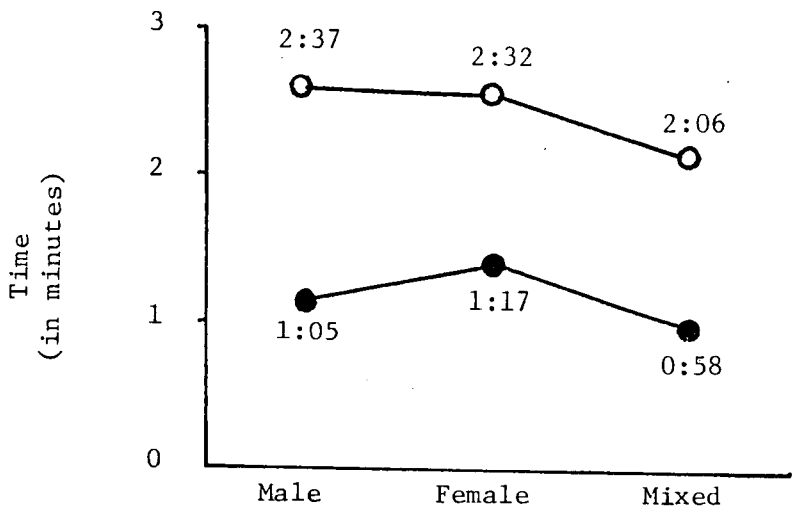

Figure VII-14. The interaction effects of dyadic sex composition and setting on the lengths of the social interactions. ○ = Semi-fixed feature space, ● = Open space. (F = 0.14, df = 2/114, not significant)

for an average period of 2 minutes, 37 seconds, female dyads interacted for an average period of 2 minutes, 32 seconds, and mixed sex dyads interacted for an average period of 2 minutes, 6 seconds. The average lengths of male, female, and mixed sex dyads interacting within the open space were 1 minute, 5 seconds, 1 minute, 17 seconds, and 58 seconds respectively.

The Amount of Variance Accounted for by the Model

The model for the multivariate analysis of variance, which included three levels of dyadic sex composition and two levels of setting accounted for 37 percent of the variance in interpersonal distances, 21 percent of the variance in shoulder orientations, 14 percent of the variance in the lengths of the interactions, and 10 percent of the variance in the percent of time spent in mutual facial regard (see Appendix C). The Wilks' Criterion statistic, which measured the ability of the model to predict these behaviors as a whole, yielded a value of 31.57 (df = 4/111) which was significant at the .001 level.

Appendices D through G contain the average distances, orientations, percentages of time spent in mutual facial regard, and lengths of interactions for each of the groups in the study.

The Interrelationships Among Distancing, Orientation, and Visual Behaviors

A Spearman Rank-Order correlation revealed that greater interpersonal distances were associated with more direct shoulder orientations. The critical-ratio z-test of the rho value of .0576 ($z = \text{rho}\sqrt{N-1}$) yielded a z value of 2.042 which was significant beyond the .05 level.

With respect to the relationship between interpersonal distances and gaze direction, an analysis of variance revealed that significantly greater interpersonal distances occurred when there was mutual facial regard than when there was no mutual facial regard ($p < .04$). As Figure VII-15 illustrates, the average interpersonal distance when there was mutual facial regard was 33.6 inches while the average interpersonal distance when there was no mutual facial regard was 34.7 inches.

An analysis of variance also revealed a significant relationship between orientation behavior and gaze direction ($p < .0001$). Figure VII-16 shows that the mean shoulder orientation occurring when there was mutual facial regard was 80 degrees, while the mean shoulder orientation occurring when there was no mutual facial regard was 90 degrees.

The Relationship Between Listening Behavior and Looking Behavior

Chi square tests were imposed on the data to determine if listeners looked at speakers more than speakers looked at listeners. There was a significant relationship between listening behavior and looking behavior in only one case; females within mixed sex dyads looked at their coactors significantly more while listening than while speaking. During listening periods, females within mixed sex dyads looked at their coactors 75 percent of the time; during speaking periods, they looked at their coactors 64 percent of the time. The corrected chi square value of 4.83 with 1 degree of freedom was significant at the .028 level. Table VII-1 presents the relationship between looking behavior and listening behavior for all groups.

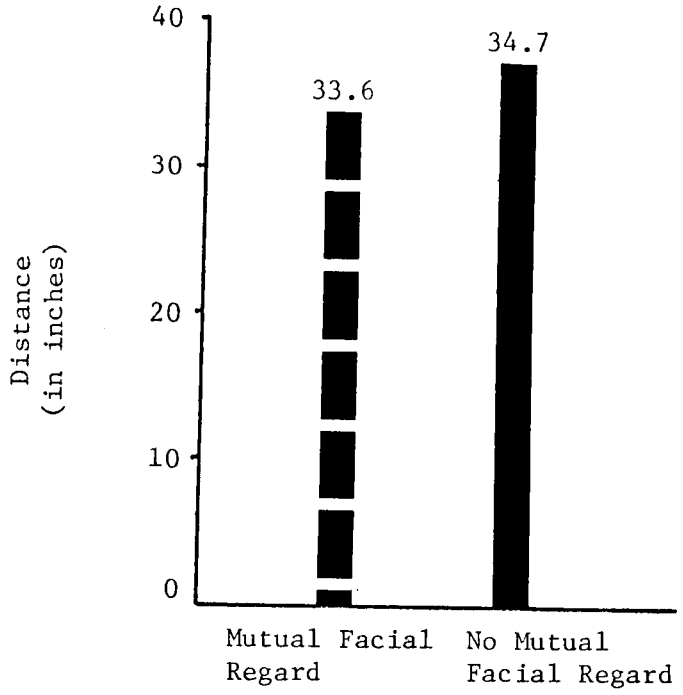

Figure VII-15. The relationship between mutual facial regard and interpersonal distances. ($F = 4.22$, $df = 1/1267$, $p < .04$)

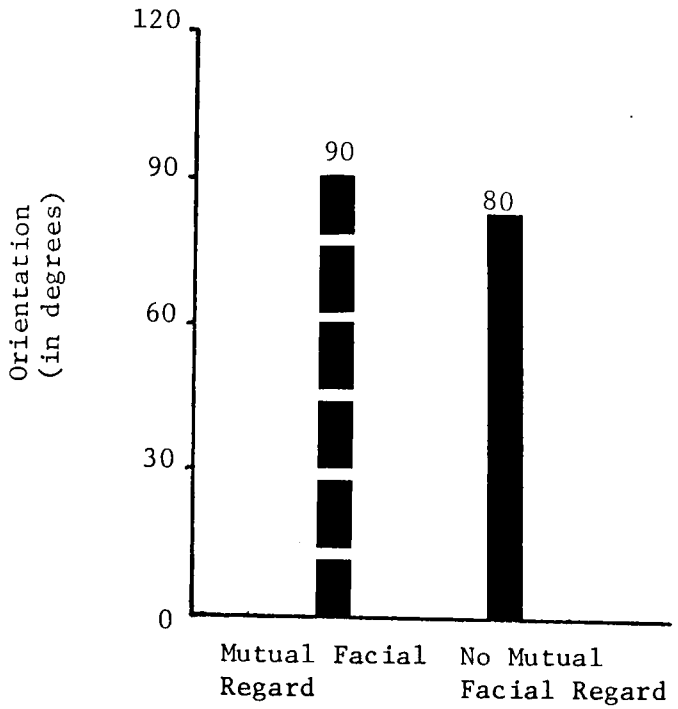

Figure VII-16. The relationship between mutual facial regard and shoulder orientations. ($F = 19.48$, $df = 1/1267$, $p < .0001$)

TABLE VII-2

PERCENT OF TIME SPEAKERS LOOKED AT LISTENERS COMPARED TO PERCENT OF TIME LISTENERS LOOKED AT SPEAKERS

Group	Percent of Time Listener Looked at Speaker	Percent of Time Speaker Looked at Listener	Probability Level of Obtained χ^2 value
All Male Dyads			
Male A	67%	71%	$p. = .41$
Male B	72%	73%	$p. = .93$
All Female Dyads			
Female A	77%	71%	$p. = .16$
Female B	86%	79%	$p. = .10$
All Mixed Sex Dyads			
Female Member	75%	64%	$p. = .03$
Male Member	65%	61%	$p. = .60$
Informal Space			
Coactor A	79%	76%	$p. = .50$
Coactor B	83%	75%	$p. = .07$
Semi-Fixed Feature Space			
Coactor A	69%	65%	$p. = .23$
Coactor B	70%	72%	$p. = .56$
For All Groups			
Coactor A	72%	69%	$p. = .18$
Coactor B	74%	73%	$p. = .66$

Changes in Proxemic Behavior Over the Course of Interactions

Comparisons of the distancing and orientation behaviors of the dyads at the first, middle, and last coding periods were made through one way analyses of variance with repeated measures. Comparisons of the number of dyads engaging in mutual facial regard at the first, middle, and last coding periods were made through a chi square analysis.

With respect to changes in distancing behavior, the analysis revealed that distances increased significantly over the courses of the interactions ($p < .01$). The average interpersonal distance at the beginning of interactions was 23 inches, the average distance for the middle coding period was 26 inches, and the average distance for the last coding period was 28 inches (see Figure VII-17). The shoulder orientations adopted by the dyads also significantly differed over the course of time ($p < .04$). As Figure VII-18 illustrates, the average shoulder orientations for the first, middle, and last codes were 61 degrees, 54 degrees, and 61 degrees, respectively. Finally, the percentages of dyads engaging in mutual facial regard changed significantly over the course of the interactions ($p < .03$). The percentages of dyads engaging in mutual facial regard at the first, middle, and last coding periods were 64 percent, 59 percent, and 49 percent, respectively (see Figure VII-19).

The last changes in proxemic behaviors were also examined in order to investigate the nonverbal cues of interaction termination. By comparing the very last distancing recording of the interaction to the immediately previous code in which a different distance was recorded, it became apparent that standing dyads signalled the ends

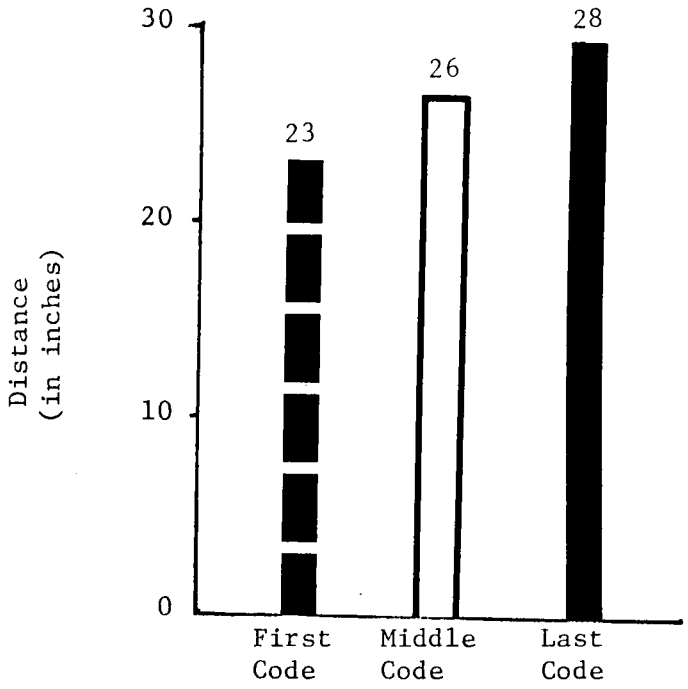

Figure VII-17. Changes in interpersonal distances over the course of social interactions. ($F = 4.21$, $df = 2/198$, $p < .01$)

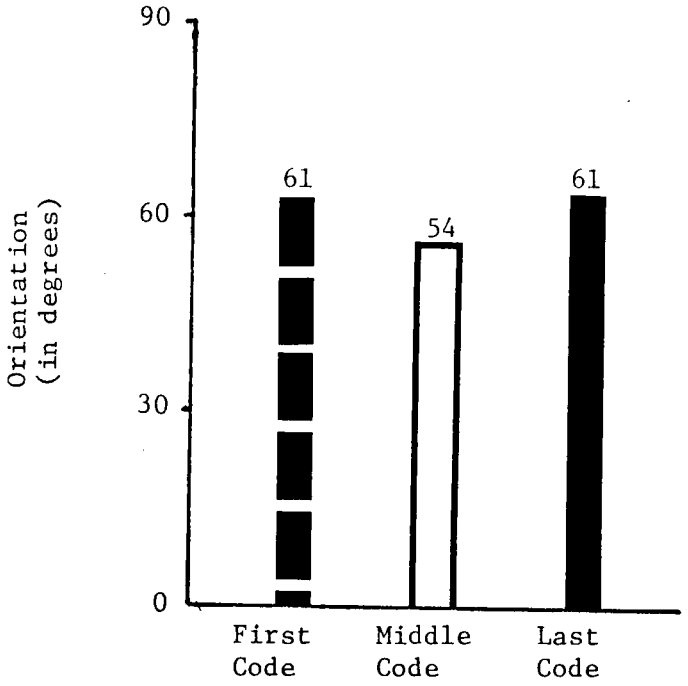

Figure VII-18. Changes in shoulder orientations over the course of social interactions. ($F = 3.87$, $df = 2/198$, $p < .04$)

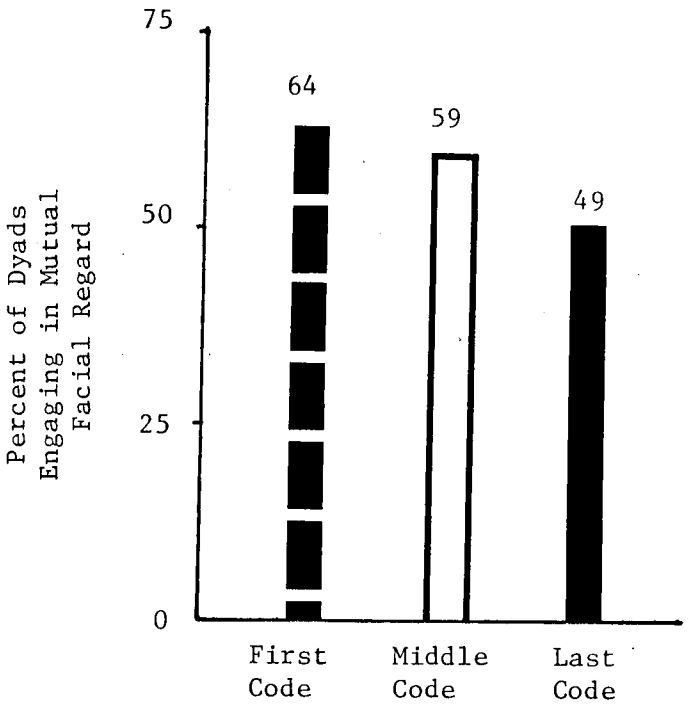

Figure VII-19. Changes in the percentages of dyads engaging in mutual facial regard over the course of social interactions. (χ^2 = 7.228, 2 df, p <.03)

of their interactions by increasing their interpersonal distances. That is, for 74 percent of the standing dyads, the last interpersonal distance recorded was greater than the last different interpersonal distance recorded. At the same time, however, the orientations of the standing dyads was equally likely to become more direct as less direct at the end of the interaction. For seated dyads, there were sex differences in the last changes in distancing behavior. In 60 percent of the male dyads, interpersonal distance increased immediately before the termination of the interaction, while in female dyads, only 30 percent of the distances increased at the end of the interaction. Fifteen percent of the distances for male dyads decreased at the end of the interaction while 55 percent of the distances decreased for female dyads. For seated dyads as well, there were no orientation behavior patterns associated with interaction termination. Additionally, there were no significant decreases or increases in mutual facial regard levels at the ends of the interactions.

Location and Seating Choices

The locations within the spaces where the dyads interacted were also examined. While there were no patterns in the locations chosen by dyads interacting within the semi-fixed feature space, dyads within the open space displayed certain location preferences. The most popular choice of location for interactions within the open space was close to a wall. In 48 percent of the dyadic interactions, the interaction occurred within 4 feet from a wall. There were, however, no patterns regarding which wall the dyads chose to be near. Moreover,

in 33 percent of the interactions, the dyads were within 4 feet from one of the two poles in the space (see Figure VII-1, page 159).

Within the semi-fixed feature space, there were patterns in the orientations of the couches/chairs on which the dyads sat (χ^2 = 31.65, 4df, p <.001). Of the 20 male dyads, 13 dyads sat in chairs positioned at 90 degree angles, 4 dyads sat side by side either on a couch or 2 chairs, 2 dyads sat at a 135 degree angle, and 1 dyad sat at a 45 degree angle. Of the 20 female dyads, 12 dyads sat at a 90 degree angle, and 8 dyads sat at a 180 degree angle. Finally, 13 of the mixed sex dyads sat side by side, 5 dyads sat at a right angle, and 2 dyads sat at a 135 degree angle. It should be pointed out again, however, that there was no correlation between the average shoulder orientations of the dyads and the angles of the seats on which they sat.

IV. Discussion

> The ecological environment does not define behavior, . . . it is, rather, permissive, supportive, or resistive. (Roger Barker, 1963, p. 21)

This study yielded a number of rather interesting, and in some cases, quite unexpected results. For example, in terms of setting effects, it had been hypothesized that proxemic behavior would be more immediate in the semi-fixed feature space (lounge) than in the open space (foyer). However, the analyses revealed that proxemic behavior was more immediate in the open space than in the semi-fixed feature space. A second unexpected result was obtained regarding the relationship between interpersonal distancing behavior and visual behavior. While a number of studies have reported data in support of the Immediacy

System Theory's corollary that greater interpersonal distances should be associated with greater amounts of looking behavior, the data from the present study revealed a significant relationship in the reverse direction.

In the following sections, these and the other findings of the present research are discussed in depth.

Setting Effects

The results of the analyses of the effects of setting on the behavior of the interacting dyads revealed that in three out of four cases, the data were in direct conflict with the hypotheses. It had been originally hypothesized that the proxemic behavior of the dyads would be significantly more immediate within the semi-fixed feature space than in the open space. That is, it had been predicted that when social interaction was facilitated by the sociopetal spatial organization of a lounge, interpersonal distances would be smaller, orientations would be more direct, and amounts of mutual facial regard would be greater. Precisely the opposite effects emerged. First, interpersonal distances were significantly greater in the semi-fixed feature space than in the open space. As Figure VII-3 (page 171) illustrates, the mean interpersonal distance observed in the semi-fixed feature space was 37 inches; the mean interpersonal distance observed in the open space was 27 inches. Secondly, shoulder orientations were significantly less direct in the semi-fixed feature space than in the open space (see Figure VII-4, page 171). The mean shoulder orientation within the semi-fixed feature space was 100 degrees, compared to a mean of 48 degrees in the open space. Finally, there was significantly less

mutual facial regard in the semi-fixed feature space than in the open space (see Figure VII-5, page 173). Dyads interacting within the semi-fixed feature space engaged in mutual facial regard an average of 51 percent, while dyads interacting within the open space engaged in mutual facial regard an average of 65 percent of the time. The only prediction concerning setting effects which did receive support was the hypothesis concerning the lengths of the social interactions. Here it had been predicted that the social interactions occurring in the semi-fixed feature space would be of longer duration than the social interactions occurring in the open space. As Figure VII-6 (page 173) shows, the mean length of interactions within the semi-fixed feature space was 2 minutes, 25 seconds, while the mean length of the interactions within the open space was 1 minute, 6 seconds.

The original hypotheses concerning differences in behavior in the open and semi-fixed feature space were based on two notions. First, it was thought that those people who were willing to make a commitment to interact by sitting down together were more likely to be (a) better acquainted with one another, (b) attracted to one another, and (c) anticipating a reinforcing interaction. More immediate proxemic behaviors have been demonstrated to occur under these social circumstances (e.g., Campbell et al., 1966; Haase and Pepper, 1972; Heshka and Nelson, 1972). Secondly, because the spatial organization of the semi-fixed feature space was sociopetal, and because sociopetal spaces "bring people together" (Sommer, 1969, p. 121), it was expected that the dyads would be more immediate proxemically. In other words, it was expected that within a behavior setting that was designed for social

interactions (the lounge), the dyadic interactions would be facilitated and hence, more intimate on the proxemic level.

The fact that the effects of setting on the behavior of the dyads were so strong, but in the opposite direction than predicted, prompted a reformulation of ideas about the effects of sociopetal and sociofugal spaces on social behavior. That is, the finding that the social interactions were significantly longer in the semi-fixed feature space than in the open space does suggest that the former type of space encourages interaction while the latter type of space does not. What the proxemic behavior data indicate is that more immediate proxemic behaviors are necessary in a sociofugal space than in a sociopetal space in order to keep the dyads focused in an environment that is pulling them apart. Conversely, the dyads interacting within the sociopetal lounge have the support of the setting, and thus may vary their proxemic behavior without concern that the interaction will break down.

It is apparent that Barker's notions concerning behavior settings have direct relevance here. There were two behavior settings in the present study. The first behavior setting was a lounge which was frequently used for social interaction behavior. The second behavior setting was a foyer which served mainly as a pathway. Consequently, those dyads interacting within the lounge were within a supportive environment, while those interacting within the foyer were within a resistive environment. While social interaction within the foyer was not impossible (thus demonstrating Barker's point that the ecological environment cannot <u>define</u> behavior), the resistive nature of the foyer necessitated more immediate proxemic behavior in order to keep the dyadic interaction focused.

Dyadic Sex Composition Effects

A number of predictions had been generated concerning the effects of dyadic sex composition on the behavior of the interacting dyads. First, with respect to sex differences in interpersonal distancing behavior, it had been hypothesized that mixed sex dyads would interact at the closest distances, followed by female dyads, with male dyads interacting at the greatest distances. This hypothesis was based on past research which has indicated that female dyads prefer closer interpersonal distances than male dyads (e.g., Lerner et al., 1975; Pellegrini and Empey, 1970), and that mixed sex dyads prefer closer interpersonal distances than same sex dyads (e.g., Duke and Nowicki, 1972; Guardo, 1969). This hypothesis was further bolstered by Baxter's study of the interpersonal preferences of dyads of all three sex compositions. He reported that while standing side by side observing animals in a zoo, mixed sex dyads displayed the closest interpersonal distances, followed by female dyads, with male dyads displaying the greatest interpersonal distances.

The data from the present study revealed significant differences due to dyadic sex composition, but these differences were not entirely in the expected direction. While male dyads interacted at greater distances than female dyads, mixed sex dyads did not interact at the closest distances, but rather interacted at intermediate distances (see Figure VII-7, page 175). The mean distance for male dyads was 37 inches, the mean distance for mixed sex dyads was 35 inches, and the mean distance for female dyads was 31 inches. It is noteworthy that the mean interpersonal distances adopted by the male, female, and mixed sex dyads

fall within the far phase of the personal distance zone, which ranges from 30 inches to 48 inches.

Two points should be made regarding the present findings concerning sex differences in interpersonal distancing preferences. First, as it was pointed out above, the hypothesis that mixed sex dyads would interact at the closest interpersonal distances was partially based on Baxter's observations of dyads' distancing behavior as they were standing side by side. The discrepancy between his findings and the findings of the present study suggests that orientational context may influence sex differences in interpersonal distancing preferences. In the first study of the present research, in which shoulder orientation was held constant at 180 degrees, the direction of sex differences was the same as the direction of differences reported by Baxter. In the present study, in which the overall mean orientation was 84 degrees, mixed sex dyads interacted at intermediate distances rather than the closest distances. Thus it may be that the orientational context within which distancing choices are made influences the direction of the differences. An attempt was made to explore this possibility by examining sex differences in distancing behavior in those cases in which the dyads were interacting within 180 degree orientations. However, 180 degree shoulder orientations occurred less than ten times out of 1269 observations, precluding such an analysis.

A second point should also be made about the present study's findings regarding sex differences in interpersonal distancing behavior. As the literature review of this paper illustrated, most of the research concerning interpersonal distancing preferences has focused on approach

distancing preferences. So, it was decided, in the present study, to examine the approach distancing behavior of the dyads. In other words, the first distancing code of each of the 120 dyadic interactions was examined. Interestingly enough, comparisons of the first distancing codes revealed that mixed sex dyads adopted the closest interpersonal distances ($\overline{X}$ = 31.5 inches), female dyads adopted intermediate distances ($\overline{X}$ = 32.7 inches), and male dyads adopted the greatest interpersonal distances ($\overline{X}$ = 33.4 inches). These differences in approach distances, albeit non-significant, were in the direction originally hypothesized. This finding has important theoretical implications in that it suggests that approach distancing behavior may not be the same phenomenon as dyadic distancing behavior during the course of interactions.

With respect to orientation behavior, it had been hypothesized that mixed sex dyads would adopt the most direct shoulder orientations, followed by female dyads, with male dyads adopting the least direct shoulder orientations. The results from the analysis of orientation behavior revealed that mixed sex dyads adopted the most direct orientations, male dyads adopted slightly less direct orientations, and female dyads adopted the least direct orientations (see Figure VII-8, page 175). The mean shoulder orientation for mixed sex dyads was 79 degrees, the mean shoulder orientation for male dyads was 82 degrees, and the mean shoulder orientation for female dyads was 91 degrees.

Again, because most research in this area has examined orientation behavior only at the onset of interactions (e.g., Mehrabian, 1968a; Mehrabian and Friar, 1969; Patterson, 1973a; Pellegrini and Empey, 1970), the data were reanalyzed in terms of the first orientation recorded for each of the interactions. The results from the analysis of the first

orientations revealed that, although the differences were not statistically significant, the direction of the differences were compatible with the original predictions concerning this mode of behavior. The first orientations recorded were most direct for mixed sex dyads ($\bar{X}$ = 81 degrees), were intermediate for female dyads ($\bar{X}$ = 82 degrees), and least direct for male dyads ($\bar{X}$ = 84 degrees). This finding further demonstrates that studies of proxemic behavior at the onset of interactions may not necessarily yield accurate information about proxemic behavior during the course of interactions.

At this point, it is appropriate to call attention to an interesting pattern that emerged from the analyses of sex differences in interpersonal distancing behavior and orientation behavior. When both the distancing and orientation behaviors of male and female dyads are considered simultaneously, sex differences in the use of proxemic modes becomes apparent. That is, while female dyads adopted much closer interpersonal distances than male dyads (see Figure VII-7, page 175), female dyads concurrently adopted much less direct shoulder orientations than male dyads (see Figure VII-8, page 175). These data suggest, then, that male and female dyads are achieving comparable degrees of immediacy, but are using different modes of proxemic behavior to do so. Hence, if a researcher examined only distancing behavior and obtained these data, he/she would conclude that female dyads prefer more immediacy than male dyads. Conversely, if only orientation behavior was examined, it would appear that male dyads prefer more immediacy than female dyads. Thus, the emergence of this pattern is a testimonial to the importance of examining multiple modes of proxemic behavior simultaneously in order to determine precisely where sex differences in proxemic behavior lie.

There were two hypotheses generated concerning the effects of dyadic sex composition on visual behavior during the course of the interactions. First, on the basis of past research (Argyle and Dean, 1965; Aeillo, 1972; Coutts and Schneider, 1975), it had been predicted that the amount of time spent in mutual facial regard would be greatest for female dyads, intermediate for mixed sex dyads, and least for male dyads. As Figure VII-9 (page 177) indicates, there was no significant main effect for dyadic sex composition on the percent of time the dyads spent in mutual facial regard. Female dyads were coded as engaging in mutual facial regard in 65 percent of the observations; both male dyads and mixed sex dyads were coded as engaging in mutual facial regard in 55 percent of the observations.

In Chapter III of this paper, it was pointed out that mutual facial regard requires the cooperation of both interactants. Hence, it was appropriate to analyze sex differences in gaze direction in terms of how often males and females looked at their coactors, regardless of the coactor's gaze directions. Here, it was hypothesized that females would look at their coactors more than males would. The data from the study supported this hypothesis. Females looked at their coactors 76 percent of the time, while males looked at their coactors 68 percent of the time. This result corroborates the results of past studies that have reported that females tend to look at their coactors more than males (e.g., Ashear and Snortum, 1971; Exline et al., 1965; Libby, 1970).

With respect to sex differences in the durations of the social interactions, it had been predicted that female dyads would engage in longer social interactions than either male or mixed sex dyads because females tend to be more affiliative (Anastasi, 1958). The data from the

study revealed that there were no significant differences in interaction length due to dyadic sex composition (see Figure VII-10, page 177). Female dyads engaged in only somewhat longer interactions ($\bar{X}$ = 1 minute, 54 seconds) than male dyads ($\bar{X}$ = 1 minute, 51 seconds) and mixed sex dyads ($\bar{X}$ = 1 minute, 32 seconds). It appears that the failure to obtain significant differences in this case was caused by the large variability in the lengths of the social interactions. The lengths of interactions for male dyads ranged from 10 seconds (in the foyer) to 7 minutes, 20 seconds (in the lounge). The lengths of interactions for mixed sex dyads ranged from 10 seconds (in the foyer) to 9 minutes, 20 seconds (in the lounge). Finally, the lengths of interactions for female dyads ranged from 10 seconds (in the foyer) to 9 minutes, 50 seconds (in the lounge).

Now that the effects of dyadic sex composition have been discussed in terms of each of the individual dependent measures, it is appropriate to proffer interpretations about the overall proxemic patterns that emerged from these data. When the effects of dyadic sex composition on distancing behavior, orientation behavior, and visual behavior are considered in toto, it becomes apparent that the proxemic behaviors of mixed sex dyads were more similar to the behaviors of male dyads than to the behaviors of female dyads. For example, the interpersonal distancing behavior of mixed sex dyads ($\bar{X}$ = 35 inches) was rather similar to the distancing behavior of male dyads ($\bar{X}$ = 37 inches). Females, however, interacted at considerably closer distances than either male or mixed sex dyads; the mean interpersonal distance for female dyads was 31 inches. Similarly, male and mixed sex dyads adopted comparable

shoulder orientations which contrasted with the shoulder orientations adopted by female dyads. The mean orientations for mixed sex dyads and male dyads were 79 degrees and 82 degrees respectively, while the mean orientation for female dyads was 91 degrees. Finally, with respect to visual behavior, the mean percent of time spent in mutual facial regard by both mixed sex dyads and male dyads was 55 percent; the mean percent of time females engaged in mutual facial regard was 65 percent.

In order to attempt to explain these phenomena, it is necessary to tread on the thin ice of speculation. That is, it may be inferred from the data that the tendency for the proxemic behaviors of mixed sex dyads to approximate the proxemic behaviors of male dyads is a function of males' ability, within a generally male dominated society, to control communicative processes during face to face interactions. There have been suggestions that males are more effective than females in controlling interactions on the verbal level in terms of being able to bring up and maintain conversation topics in which they are interested, and conversely, being able to squelch topics in which they are not interested (Parlee, 1979). Since proxemic behavior is an integrated facet of communication, it is possible that males tend to control the nature of the social interaction on the proxemic level as well. Furthermore, if this piece of speculation is on the right track, it might explain the finding that the social interactions of mixed sex dyads were shorter than the interactions of male and female dyads. Aeillo (1972, 1977) has reported that females decrease their looking behavior when manipulated interpersonal distances are increased beyond seven feet, while males continue

to increase their looking behavior as interpersonal distances are increased, at least up to distances of 14.5 feet. Aeillo has suggested that this sex difference in visual behavior reflects males' willingness to keep the interaction focused across extended distances and a reflection of females' unwillingness to do so. Thus, it may be possible that the less immediate proxemic situation within mixed sex dyads is not sufficiently intimate for females, and that when the females are unsuccessful in achieving the degree of immediacy they desire (because of the males' control through compensatory behaviors), they become uncomfortable, and thus prefer to engage in shorter interactions.

This notion provides an attractive idea for future research. It could be determined, through naturalistic observations of mixed sex dyads, whether there are attempts by females to make interactions more intimate proxemically which are followed by compensatory behaviors by males which serve to reestablish less immediacy between the interactants. If these proxemic behavior patterns were discerned, it would be interesting to see if the females, rather than the males, tended to precipitate the termination of the interactions.

Sex by Setting Effects

When the effects of dyadic sex composition and setting were considered in combination, a number of behavioral patterns emerged. For example, the sex by setting analysis of interpersonal distancing behavior significant effects of setting on sex differences in behavior. As Figure VII-11 (page 179) illustrates, the source of the main effect for dyadic sex composition was based mainly on the interpersonal

distancing behavior of the dyads interacting within the semi-fixed feature space. That is, sex differences within the semi-fixed feature space were rather pronounced; the mean distance for male dyads was 42 inches, the mean distance for female dyads was 33 inches, and the mean distance for mixed sex dyads was 38 inches. Sex differences in the distancing behavior of dyads interacting within the open space were much smaller; the mean interpersonal distances for male, female, and mixed sex dyads were 25 inches, 27 inches, and 28 inches respectively. This significant interaction effect is theoretically important because it indicates that, within the semi-fixed feature space, members of dyads may feel a greater freedom to "choose" their proxemic behaviors because they are interacting within a sociopetal, and thus supportive, environment. The social facilitating effect of the setting allows sex differences in behavior to manifest themselves without danger of the interaction breaking down. On the other hand, dyads interacting within the open space are in a kind of conflict with their environment. They are engaging in social interactions within a sociofugal space, which, by definition, is a space that inhibits social intercourse. The absence of sex differences in interpersonal distancing behavior within the open space suggests that the sociofugal nature of the setting overrides sex differences in distancing preferences because all of the individuals are confronted with the same problem of keeping the dyads focused within an environment that is drawing them apart.

With respect to the significant sex by setting interaction effect on orientation behavior, a different phenomenon seems to be occurring. Here, it appears that there are sex differences in responses

to changes in setting. That is, within both the open space and the semi-fixed feature space, there were considerable sex differences in orientation behavior, but the directions of these differences were not the same across settings (see Figure VII-12, page 179). While male dyads' shoulder orientations became more direct when the setting was changed from an open space to a semi-fixed feature space, female dyads' shoulder orientations became less direct when the setting was changed from an open space to a semi-fixed feature space. Within the open space the mean orientations for male, female, and mixed sex dyads were 59 degrees, 44 degrees, and 43 degrees respectively; within the semi-fixed feature space, the mean orientations for male, female, and mixed sex dyads were 91 degrees, 114 degrees, and 95 degrees respectively. This sex by setting interaction effect reveals that male dyads preferred more direct orientations than female dyads within the lounge, but less direct orientations than female dyads within the foyer. This finding that the direction of sex differences in orientation behavior were different within the lounge and foyer indicates that setting influences the way people behave proxemically. Consequently, patterns observed within one type of setting cannot be assumed to be generalizable to other types of settings.

The sex by setting interaction effect on the percent of time spent in mutual facial regard was not statistically significant. However, examination of Figure VII-13 (page 180), which presents the effects of sex and setting on visual behavior, reveals an interesting phenomenon. The percent of time spent in mutual facial regard by female dyads increased 17 percent when the setting was changed from the semi-fixed feature space

to the open space. The percent of time spent in mutual facial regard by mixed sex dyads increased 22 percent when the setting was changed from the semi-fixed feature space to the open space. In contrast, male dyads were virtually unaffected by the setting difference. The percent of time male dyads spent in mutual facial regard increased only 3 percent when the setting was changed from the semi-fixed feature space to the open space. This finding, then, represents a sex difference in sensitivity to changes in the physical setting, at least as expressed through visual behavior.

The sex by setting analysis of the durations of the interactions indicated that the direction of sex differences in interaction length were fairly consistent across the two settings (see Figure VII-14, page 180). Within both settings, the interactions of mixed sex dyads were of shorter durations than the interactions of male and female dyads. Male dyads engaged in slightly longer interactions than female dyads within the semi-fixed feature space. Within the semi-fixed feature space, male dyadic interactions averaged 2 minutes, 37 seconds, while female dyadic interactions averaged 2 minutes, 32 seconds. Within the open space, female dyads engaged in longer interactions than male dyads; the mean interaction length for female dyads was 1 minute, 17 seconds, while the mean interaction length for male dyads was 1 minute, 5 seconds.

It should be pointed out that the finding that female dyads engaged in the longest interactions within the open space may have some theoretical implications. It was noted earlier that, in terms of body positioning (i.e., distancing and orientation), male, female, and mixed sex dyads were achieving comparable levels of immediacy, but using different modes to do so. That is, female dyads adopted closer

interpersonal distances than male and mixed sex dyads, but male and mixed sex dyads assumed more direct orientations than female dyads. However, female dyads engaged in somewhat more mutual facial regard, and females looked at their coactors more than males, regardless of the coactor's gaze direction. Thus, in terms of all three of these proxemic behaviors, female dyads were somewhat more immediate than male dyads. Consequently, it is possible that the longer interactions of female dyads within the open, sociofugal, space were a reflection of females' ability to keep the interaction focused for longer periods of time through the use of more immediate proxemic behavior, mainly as effected through the visual mode.

The present study's findings regarding the combined effects of sex and setting on distancing behavior, orientation behavior, visual behavior, and interaction duration demonstrate that the physical setting can influence proxemic behavior patterns. It becomes clear that in order to fully understand the communicative functions of proxemic behavior, it will be necessary, in the future, to give more serious consideration to the physical environmental context in which the behavior occurs.

The Interrelationships Among Distancing, Orientation, and Visual Behaviors

In the present study, three hypotheses had been generated concerning the interrelationships among interpersonal distancing behavior, orientation behavior, and visual behavior. First, it was hypothesized that the data from this study would support the corollary of the Immediacy System Theory which predicts that greater interpersonal distances should be associated with more direct shoulder orientations. A Spearman rank order correlation analysis revealed that the data

supported this hypothesis to a statistically significant degree ($p < .05$). This finding that more direct orientations are associated with larger interpersonal distances, and conversely, that less direct orientations are associated with smaller interpersonal distances, relates well to Hall's (e.g., 1966) observations concerning potentials for sensory information exchange. Hall has pointed out that, for middle class Anglo-Americans, body positioning which allows for the interactants to smell each other, and to detect the heat and odor from each other's breath, is usually reserved for intimates within intimate situations (such as slow dancing and making love). Inasmuch as the present study's observation locations were public places, cultural norms dictated that such intimate sensory exchange were inappropriate (Hall, 1966, p. 118). Through the adoption of less direct shoulder orientations within closer interpersonal distances, the members of the dyads were able to reduce the potential for such olfactory and thermal sensory information exchange.

With respect to the relationship between interpersonal distances and visual line of regard, it had been hypothesized that greater interpersonal distances would occur when the dyads were engaging in mutual facial regard than when the dyads were not engaging in mutual facial regard. This hypothesis was based on the Immediacy System Theory's corollary that increased interpersonal distances are associated with more looking behavior (e.g., Argyle and Dean, 1965; Patterson, 1973a). The results from the present research revealed that the opposite effect was present to a significant degree. As Figure VII-15 (page 183) illustrates, interpersonal distances were significantly smaller when there was mutual facial regard than when there was no mutual facial regard. The mean interpersonal distance occurring when there was mutual

facial regard was 33.6 inches; the mean interpersonal distance occurring when there was no mutual facial regard was 34.7 inches. This result is in direct conflict with the results reported by Aeillo, 1972, 1977; Argyle and Dean, 1965; Argyle and Ingham, 1972; Coutts and Schneider, 1975; Goldberg et al., 1969; and Russo, 1975. However, it should be noted that each of these studies was conducted in the laboratory where interpersonal distances were manipulated, and the resultant changes in visual behavior were observed. Therefore, the results of the present study indicate that the relationship between interpersonal distancing behavior and visual behavior which is manifest within laboratory situations is not the same as the relationship between these behaviors which is manifest within natural settings, where both distancing behavior and visual behavior vary freely.

Finally, it had been hypothesized that more direct shoulder orientations would be associated with greater amounts of looking behavior. The data supported this prediction in that shoulder orientations were significantly more direct when the dyads were engaging in mutual facial regard than when they were not engaging in mutual facial regard (see Figure VII-16, page 183). The mean shoulder orientation occurring when there was mutual facial regard was 80 degrees; the mean shoulder orientation occurring when there was no mutual facial regard was 90 degrees. In the Immediacy System chapter of this paper, it was pointed out that laboratory investigations of the relationship between orientation behavior and visual behavior have produced data both in support of the theory's corollary that more direct orientations should be associated with less looking behavior (Patterson, 1973a; Watson,

1966) and in conflict with this corollary (Beach and Sokoloff, 1974; Mehrabian, 1968a, 1968b). The present research provides evidence that within field situations, more direct orientations are associated with more looking behavior, rather than less looking behavior. Hence, the data supported the hypothesis that when proxemic behaviors occur in natural settings, compensations for orientations that are "too direct" or "too indirect" would not be effected through visual behavior (because of the discomfort entailed in looking in one direction while oriented in another), but instead would be effected through distancing behavior (which does not entail physical discomfort).

In conclusion, the analyses of the interrelationships among interpersonal distancing behavior, orientation behavior, and visual behavior provided little support for the Immediacy System Theory. The fact that the analysis of the relationship between distancing behavior and visual behavior, and the analysis of the relationship between orientation behavior and visual behavior yielded results not only non-supportive of the theory, but indeed, in direct conflict with the theory, suggests a reevaluation of the laboratory research that has been conducted concerning the relationships among these behaviors. That is, the results from this study demonstrate that the proxemic behavior patterns observed in the laboratory are not always generalizable to field situations. The reason for this seems to be twofold. First, the relationships among proxemic behaviors appear to be affected by the interactants' degree of freedom to behave proxemically. When one proxemic behavior is experimentally manipulated, the relationships among the proxemic behaviors are different than when the interactants are in control of the entire proxemic system of behavior. Secondly,

interactants seem to be affected by the setting in which they are behaving, both in terms of the physical limitations the setting may impose, and in terms of the standing patterns of behavior that are suggested by the setting.

The Relationship Between Listening Behavior and Looking Behavior

With respect to the relationship between listening behavior and looking behavior, it had been hypothesized that listeners would look at their coactors more than speakers would. This relationship has been reported by Argyle (1975), Argyle and Dean (1965), Day (1964), Kendon (1964), and Patterson (1975). Unexpectedly, this behavioral pattern did not appear to a significant degree except in one case: females within mixed sex dyads looked at their coactors significantly more while listening than while speaking (see Table VII-2, page 184). During listening periods, females within mixed sex dyads looked at their coactors 75 percent of the time; during speaking periods, they looked at their coactor 64 percent of the time.

In view of the fact that most of the investigations which have reported a significant relationship between listening behavior and looking behavior were conducted in the laboratory, it is possible that this relationship occurs within laboratory settings, but not within public lounges and foyers. However, the more probable explanation for why this effect was not consistently observed in the interacting dyads is that the time sampling technique prevented the relationship from emerging. That is, in recording listening and looking behavior at 10 second intervals, the relationships between these behaviors may have been obscured. Had it been possible to obtain videotape recordings of the interactions, the relationship between listening behavior and looking

behavior quite possibly could have become apparent. However, due to ethical factors (regarding the ethical implications of making videotapes of people without their consent) and pragmatic factors (mainly, the inability to obtain permission to install videotape equipment in the settings), live observations were taken.

It should be noted here that live observations were taken also instead of still photographs. Still photographs were not taken for a number of reasons. First, the ethical questions involved in obtaining visual records of individuals without their consent pertain to still photographs as well as videotape recordings. Secondly, if photographs were taken, the result would still be time sampling type data. Thirdly, photographs could not reliably indicate who was speaking at the time the photographs were taken. Fourthly, the visual recordings of complete interactions would not always be possible. Jones (1971) reported that in his investigations of multiple modes of proxemic behavior, he lost data because of inadequate quality in photographs. It should be mentioned that in subsequent research, Jones employed live observation techniques (Jones and Aeillo, 1973). Additionally, it would be difficult to unobtrusively switch cameras when an interaction observation required more than 36 observations. Finally, a live observation technique was utilized because a number of researchers have employed this technique in studies of multiple modes of proxemic behavior, and reported no discontent with this methodology, and moreover, asserted that the unobtrusiveness associated with live observation is an asset in ecological investigations (Aeillo and Aeillo, 1972; Goldberg et al., 1969; Jones and Aeillo, 1973; Mehrabian and Friar, 1969; Mehrabian and Diamond, 1971).

Therefore, although the absence of visual records in the present study precludes a more in depth examination of what was occurring nonverbally during the interactions, a live observation technique for data collection was deemed satisfactory for the purposes of the research.

Changes in Proxemic Behavior Over the Course of Interactions

The analyses of changes in proxemic behavior during the course of interactions yielded rather interesting results. First, with respect to changes in distancing behavior, the data revealed that interpersonal distances increased over the course of interactions (see Figure VII-17, page 186). The average distance at the beginning of the interactions was 23 inches, the average distance at the middle coding period of the interaction was 26 inches, and the average distance for the last coding period of the interactions was 28 inches. Thus, with respect to interpersonal distancing behavior, the dyads became less immediate as the interactions progressed. Shoulder orientations also differed significantly over the course of the interactions (see Figure VII-18, page 186). In the proxemic mode of orientation, dyads were more immediate at the middle of the interactions than they were at the beginning or end of the interactions. The mean shoulder orientations at the first, middle, and last codes were 61 degrees, 54 degrees, and 61 degrees respectively. Finally, the percent of dyads coded as engaging in mutual facial regard decreased significantly during the course of the interactions (see Figure VII-19, page 187). Sixty-four percent of the dyads were engaging in mutual facial regard at the first code of the interactions, 59 percent were engaging in mutual facial regard at the middle code of the interactions, and 49 percent of the dyads were engaging in mutual facial

regard at the last code of the interactions. With respect to the interpersonal distancing and visual modes, it is apparent that the dyads' proxemic behaviors are most immediate at the onset of the interaction and become less immediate as the interaction progresses. In contrast, within the orientation mode, the dyads are more immediate at the middle of the interactions than at the beginning or end of the interactions. While one can only speculate, it seems possible that the more direct orientations at the middle of the interactions serve to keep the dyads focused in spite of the increasingly less immediate behaviors within the distancing and visual modes. That is, if the dyads became less immediate in all three proxemic modes in the middle of their conversations, the social interactions might terminate prematurely.

The last changes in proxemic behaviors were also examined in order to investigate proxemic signals of interaction termination. It was predicted that interaction terminations would be marked by reductions of looking behavior, increases in interpersonal distancing behavior, and the adoptions of less direct orientations. While all three of these behavioral shifts occurred between the middle and last coding period, only distancing behavior changed significantly at the very ends of the interactions. For 74 percent of all standing dyads, the last interpersonal distance recorded was greater than the immediately previous different distance recorded. But, it is interesting to note that the increased distances were not due to the people walking away from each other, but rather due to a drifting apart of the interactants as evidenced by the lack of pattern in orientation changes. With respect to the seated dyads, an interesting sex difference appeared in the last changes in distancing behavior. In 60 percent of the male dyads,

interpersonal distances increased immediately before the termination of the interaction; in 30 percent of the female dyads, distances increased at the end of the interaction. In 15 percent of the male dyads, distances decreased at the end of the interaction, while in 55 percent of the female dyads, distances decreased at the end of the interaction. So it can be seen that within seated situations, male dyads tend to signal interaction termination by increasing interpersonal distances, while female dyads tend to signal interaction termination by decreasing interpersonal distances. It is difficult to interpret this sex difference in proxemic behavior at the ends of interactions. Possibly, female dyads are nonverbally signifying their affiliative feelings toward one another so that the termination of the interaction will carry no negative connotations such as boredom or dislike.

Location and Seating Choices

The locations of the coactors within the settings and the orientations of the seats on which coactors in the lounge sat were also examined. No patterns emerged in the locations chosen by dyads in the semi-fixed feature space. Hindsight suggests that the probable reason for the absence of any pattern was that, in many cases, dyads could not sit where they might have preferred to sit because the seats were already taken. However, patterns did emerge with respect to the locations of dyads within the open space. The most popular locations for interactions were next to the walls of the open space. Forty-eight percent of the interactions within the open space took place within 4 feet from one of 4 walls of the space. This finding relates well to Sommer's (1969) comments about the effects of sociofugal spatial

organizations on social behavior. He describes sociofugal spaces as those spaces which "drive people toward the periphery of a room" (p. 121).

Patterns emerged also with respect to the orientations of the seats on which interactants sat. The most popular seat orientation for male and female dyads was 90 degrees; 65 percent of the male dyads, and 60 percent of the female dyads interacted in chairs positioned at this angle. The most popular seat orientation for mixed sex dyads was 180 degrees; 65 percent of the dyads interacted in seats positioned at this angle. It should be noted that, for female dyads, 180 degree orientations were also frequently chosen; 40 percent of the female dyads interacted in seats positioned at this angle. These patterns in seating choice dovetail the results from past studies concerning sex differences in seated orientation preferences (e.g., Norum et al., 1967; Sommer, 1969). It is noteworthy, however, that there was no correlation between the orientations of the seats and the mean shoulder orientations of the interactants. This was an important finding in that it indicated that seat angles did not impede the proxemic behavior of the dyads in terms of shoulder orientation behavior.

Implications

In concluding this paper, it is appropriate to comment on some of the more important implications of the present research. First, this research has demonstrated that an attempt to discern patterns of behavior without consideration to the physical context in which they occur is a foolhardy enterprise. This point was illustrated quite clearly by the finding that female dyads preferred more direct

orientations than male dyads within a lounge, but male dyads preferred more direct orientations than female dyads within a foyer. The obvious implication of this finding is that behavior patterns cannot be casually assumed to be generalizable across different physical settings.

Similarly, the results reported in this paper have implications regarding the ways in which the physical environment and human behavior are interrelated. The fact that social interactions occurred at all within the sociofugal space of the foyer and the fact that the orientations of the seats were not correlated with the shoulder orientations of seated dyads demonstrate that the physical setting does not define what types of behaviors may occur. However, the significantly more immediate proxemic behavior which occurred in the sociofugal space reveals that when certain kinds of behavior occur which are not part of the standing pattern of behavior for the setting, the behaviors are likely to be altered.

Thirdly, there are implications concerning past research of proxemic behavior. It has been noted in other sections of this paper that in investigations of distancing and orientation behavior, the tendency has been to record the behaviors at only one point in time, typically at the onset of an interaction. The finding that the initial interpersonal distancing behaviors and orientation behaviors of the dyads were not reflective of these behaviors during the course of the interactions indicates that most past research in this area has provided only information on approach behaviors. Since proxemic behavior is an ongoing and dynamic communication system, the emphasis should be on how people behave proxemically throughout social interactions. Additionally, it has become clear that blanket statements

about sex differences in the amount of proxemic immediacy preferred are of no predictive value. Data from the second study revealed that while female dyads preferred closer interpersonal distances than male dyads, male dyads preferred more direct orientations than female dyads. This finding suggests that there may be sex differences in the proxemic modes used to achieve desired levels of closeness to others, but until sex differenc patterns in all of these modes are delineated, conclusions about sex differences in preferred immediacy levels may be premature.

Finally, the present research indicates that unobtrusive observations within natural settings are imperative for the discovery of the sensitive and complex ways in which proxemic behaviors relate to one another. The failure of the present study to replicate the relationship between distancing behavior and visual behavior repeatedly reported in laboratory investigations suggests that when a part of the proxemic behavior system is experimentally manipulated, the nature of the whole system is altered. This, indeed, illustrates the sensitive way in which proxemic behaviors are interrelated to form a communicative system.

In conclusion, although naturalistic observation of large numbers of people requires considerable patience, the wealth of information that may be gained concerning the interrelationships between environment and behavior make the return well worth the investment.

For it is the examination of naturally occurring behaviors within field settings that will yield accurate information about the interrelationships between the physical setting and human behavior.

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APPENDICES

APPENDIX A

RAW DATA FROM THE AMBULATORY INTERPERSONAL DISTANCING STUDY
(shoulder to shoulder distances, in inches)

Large Hall			Small Hall		
Male	Female	Mixed	Male	Female	Mixed
10	13	14	7	10	12
17	12	4	16	3	8
20	21	17	10	15	2
28	25	15	14	4	8
7	16	13	12	7	7
14	5	15	7	4	10
10	7	7	8	14	8
27	7	15	6	7	4
21	5	16	8	7	2
3	8	10	3	5	5
14	7	21	7	9	3
21	12	13	10	4	7
10	21	12	7	12	10
26	14	20	7	10	7
22	27	24	7	5	7
20	25	5	7	2	8
14	14	25	10	4	4
16	21	6	7	14	4
14	14	4	5	8	2
15	14	28	5	4	5
4	11	14	4	5	3
7	16	5	14	5	8
21	8	21	13	15	7
21	22	4	12	7	18
20	7	10	8	8	4
7	13	7	5	4	4
14	12	10	7	10	17
5	25	3	8	7	7
7	10	11	7	7	14
23	10	11	7	17	8

APPENDIX B

SAMPLE CODING SHEET

DYAD I.D. # _____

OBSERVER _____ DATE _____

CONDITION: DYADIC SEX COMPOSITION _____ ENVIRONMENT _____

TOTAL DURATION OF INTERACTION _____

Number of 10 Second Intervals	Distance (inches)	Shoulder Orientation (1-5)	Speaker (A or B)	A's Gaze Direction (1 or 0)	B's Gaze Direction (1 or 0)
1					
2					
3					
4					
5					
6					
7					
8					

DYAD I.D. # _____

Number of 10 Second Intervals	Distance (inches)	Shoulder Orientation (1-5)	Speaker (A or B)	A's Gaze Direction (1 or 0)	B's Gaze Direction (1 or 0)

APPENDIX C

ANALYSIS OF THE EFFECTS OF DYADIC SEX COMPOSITION AND TYPE OF SETTING ON INTERPERSONAL DISTANCES, SHOULDER ORIENTATIONS, LENGTHS OF SOCIAL INTERACTIONS, AND PERCENT OF TIME SPENT IN MUTUAL FACIAL REGARD

ANALYSIS OF VARIANCE OF THE EFFECTS OF DYADIC SEX COMPOSITION AND TYPE OF SETTING ON INTERPERSONAL DISTANCES

Source	df	SS	MS	F	R-Square
Model	5	5646.89	1129.38	13.39*	.37
Error	114	9615.66	84.35		
Corrected Total	119	15262.56			

* $p < .0001$

ANALYSIS OF VARIANCE OF THE EFFECTS OF DYADIC SEX COMPOSITION AND TYPE OF SETTING ON SHOULDER ORIENTATION

Source	df	SS	MS	F	R-Square
Model	5	26.55	5.31	6.15*	.21
Error	114	98.48	0.86		
Corrected Total	119	125.03			

* $p < .0001$

ANALYSIS OF VARIANCE OF THE EFFECTS OF DYADIC SEX COMPOSITION AND TYPE OF SETTING ON LENGTHS OF SOCIAL INTERACTIONS

Source	df	SS	MS	F	R-Square
Model	5	1994.38	398.88	3.76*	.14
Error	114	12096.95	106.11		
Corrected Total	119	14091.33			

* $p < .0036$

ANALYSIS OF VARIANCE OF THE EFFECTS OF DYADIC SEX COMPOSITION AND TYPE OF SETTING ON PERCENT OF TIME SPENT IN MUTUAL FACIAL REGARD

Source	df	SS	MS	F	R-Square
Model	5	9969.22	1993.84	2.42*	.10
Error	114	93827.26	823.05		
Corrected Total	119	103796.48			

* $p < .0394$

APPENDIX D

DISTANCE MEANS FOR MALE, FEMALE, AND MIXED SEX DYADS INTERACTING WITHIN OPEN AND SEMI-FIXED FEATURE SPACES (IN INCHES)

Open Space			Semi-Fixed Feature Space		
Male	Female	Mixed	Male	Female	Mixed
25.8	31.7	24.3	40.0	37.6	38.3
23.1	20.4	23.7	55.0	40.0	33.6
25.0	35.2	26.0	56.9	56.4	31.8
16.0	19.6	19.0	31.8	35.3	35.0
25.2	25.0	36.3	55.0	48.3	55.0
28.8	19.7	19.0	54.1	35.7	30.0
26.2	28.4	30.3	20.0	60.0	33.4
28.3	25.7	15.0	35.2	40.8	50.0
20.0	25.0	23.4	44.3	33.3	69.5
26.0	32.1	20.9	37.2	28.2	42.5
15.0	31.4	16.7	41.6	22.0	34.4
19.2	20.0	20.0	35.5	22.9	50.0
22.1	15.0	24.1	31.4	41.0	48.0
29.6	26.8	35.6	41.1	40.9	28.2
35.0	33.3	35.0	35.4	55.0	34.3
32.9	27.1	20.0	40.0	40.0	25.0
27.5	30.0	27.0	47.7	16.4	27.5
35.0	33.3	19.3	50.0	22.0	23.0
25.0	30.0	25.0	21.7	22.9	46.2
21.7	21.3	25.0	52.4	43.0	25.0
GROUP MEANS:					
25.3	26.8	28.2	41.6	32.9	37.8

APPENDIX E

ORIENTATION MEANS FOR MALE, FEMALE, AND MIXED SEX DYADS INTERACTING WITHIN OPEN AND SEMI-FIXED FEATURE SPACES (IN DEGREES)

Open Space			Semi-Fixed Feature Space		
Male	Female	Mixed	Male	Female	Mixed
6	135	135	135	135	45
48	68	75	90	113	45
90	0	45	101	90	135
135	108	90	106	0	135
92	45	5	135	135	135
113	45	45	135	122	135
50	45	40	90	99	135
45	43	0	135	135	45
99	45	45	90	135	135
180	41	48	45	135	135
146	18	15	45	53	45
23	45	75	90	135	45
45	68	58	135	45	45
72	0	45	135	131	132
45	45	45	45	90	42
39	26	0	129	50	135
45	135	135	45	135	135
0	45	45	90	45	45
135	45	45	45	135	90
135	45	0	45	135	135
GROUP MEANS:					
59	44	43	91	114	95

APPENDIX F

PERCENTAGES OF TIME SPENT IN MUTUAL FACIAL REGARD BY MALE, FEMALE, AND MIXED SEX DYADS INTERACTING WITHIN OPEN AND SEMI-FIXED FEATURE SPACES

Open Space			Semi-Fixed Feature Space		
Male	Female	Mixed	Male	Female	Mixed
75	67	33	67	47	56
76	50	67	88	72	57
100	33	100	63	86	10
100	80	50	36	88	71
80	100	47	45	100	33
25	25	0	73	0	40
60	50	56	42	40	75
100	93	100	52	50	32
60	100	33	0	67	80
67	85	67	67	57	25
0	100	100	43	0	39
83	0	0	40	70	33
71	75	43	43	80	27
40	77	50	9	64	43
0	83	100	69	71	33
57	71	100	60	78	50
50	100	100	58	81	50
100	100	67	73	40	38
0	100	100	83	32	25
0	67	100	65	0	60
GROUP MEANS:					
57%	73%	66%	54%	56%	44%

APPENDIX G

INTERACTION DURATIONS FOR MALE, FEMALE, AND MIXED SEX DYADS INTERACTING WITHIN OPEN AND SEMI-FIXED FEATURE SPACES (IN SECONDS)

Open Space			Semi-Fixed Feature Space		
Male	Female	Mixed	Male	Female	Mixed
80	30	30	60	170	90
170	120	30	80	180	70
10	60	110	80	70	200
10	50	20	140	170	70
250	10	190	110	30	60
40	120	20	110	70	50
100	140	90	120	50	590
30	270	10	230	60	220
50	20	90	70	30	100
30	260	120	90	530	80
40	50	30	400	50	180
60	20	30	100	560	90
70	40	70	70	50	150
150	130	240	440	220	140
10	60	10	260	210	150
70	70	10	150	90	20
80	10	10	120	210	40
10	30	30	220	50	130
10	10	10	60	190	40
30	30	10	230	50	50
GROUP MEANS:					
65	77	58	157	152	126

VITA

Patricia Lee Hudspeth Seipp was born in Asheville, North Carolina on February 10, 1951. She attended schools in North Carolina, Tennessee, New Hampshire, and Pennsylvania. In the spring of 1969, she graduated from Conestoga High School in Berwyn, Pennsylvania. The following fall, she entered the University of North Carolina at Chapel Hill. After her marriage to Raymond Havens Seipp in 1971, she moved to Chattanooga, Tennessee. She graduated from The University of Tennessee at Chattanooga in 1973. In the same year, she began her graduate work at The University of Tennessee at Knoxville where she received her Doctor of Philosophy degree in 1979.