RACE, SEX, DISTANCE, AND POSITION EFFECTS ON PERSONAL SPACE INVASION

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ABSTRACT

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By

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Twenty-six white female Ss were subjected to an invasion of their personal space in a university library setting by black, white, and oriental male and female Es. It was predicted that Ss would avoid personal discomfort by leaving the situation sooner when approached by representatives of minority races. Subjects were expected to display evidence of personal discomfort as evaluated by a defensiveness rating scale, if flight did not occur.

A race by sex of experimenter by distance interaction was found indicating that the major hypotheses of the study were correct. The results were discussed in terms of white's perceptions of minorities as sources of threat, based on the amount of information they have regarding the life-styles of other ethnic groups. Alternative speculations regarding other perceptual differences were discused, including suggestions for additional research in the area.

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This manuscript is dedicated to my wife Barbara, who never forgot that black love is truly black wealth, and to my son Joel, who like his mother, has been such a joy.

May the gods favor you always!

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TABLE OF CONTENTS

	Page
LIST OF TABLES	vi
LIST OF FIGURES	vii
Chapter	
I. INTRODUCTION	1
Proxemics and Personal Space	2
Eye Contact and Visual Interaction	11
The Influence of Racial Characteristics on Social Interaction	18
II. RATIONALE FOR THE INVESTIGATION	23
Relationship Between Race and Time	23
Relationship Between Distance and Time	24
Relationship Between Subject Placement and Time	25
Relationship Between Defensive Behavior and Time	26
III. METHOD	27
Design	27
Subjects	27
Experimenters	28
Procedure: Experimenter Tasks	28
Flight	29
Invasion Conditions	30
Data Analysis	34
IV. RESULTS	35
Black Experimenters	37
White Experimenters	38
Oriental Experimenters	41

TABLE OF CONTENTS (Con't.)

Chapter	Page
Test for Hypotheses	43
Summary of Results	45
V. DISCUSSION AND SUMMARY	48
Conclusions and Implications for Future Research	51
BIBLIOGRAPHY	55
APPENDIX	58

LIST OF TABLES

Table		Page
1.	Mean Time by Race, Sex, Distance, and Position	36
2.	Mean Scale Ratings on Defensive Behavior Items	40
3.	Mean Time by Race and Sex	44
4.	Mean Time by Race, Sex, and Position	44

LIST OF FIGURES

Figures	Page
1. Condition 1 Seating Arrangement: End Seat Subject Placement at the Close and Far Experimenter Invasion Distances	31
2. Condition 2 Seating Arrangement: Middle Seat Subject Placement at the Close and Far Experimenter Invasion Distances . . .	32
3. Linear Relationship Between Mean Time by Race and Defensive Behavior Items	46

CHAPTER I

INTRODUCTION

In response to the dearth of research examining the effects of race in relation to nonverbal behavior, and specifically to personal space invasion; and the fertility of ecologically based research in helping to solidify the nature of nonverbal behavior; it is hypothesized that: (I) Subjects whose personal space is invaded by a black experimenter maintain less time in the situation than if invaded by an oriental or white experimenter respectively; (II) The closer the experimenter sits to the subject the less time the subject will remain in the invasion situation; (III) When the subject is seated in an end chair at a table she will tolerate personal space invasion for less time than when she is seated in a middle chair; and (IV) The longer the subject remains in the invasion situation, the more she will display defensive-like behavior as a means of compensating for the discomfort of the situation.

Proxemics and Personal Space

The concept of personal space as an abundantly rich source of psychological data was relatively untouched at the beginning of the twentieth centry. Duncan (1969) outlined the major components of the area of nonverbal communication. He stated that, "it was not until the 1950's that studies began to appear reporting systematic efforts to transcribe gestures and other nonlanguage (or nonverbal) behaviors, and to understand the culturally prescribed codes that moderate their use and significance in human communication." Duncan distinguished between two broad research strategies in the area of nonverbal communication. The first of these, the structural approach, has as its objective to identify fundamental elements of nonverbal behavior, and to investigate the systematic relationships among these units. The other strategy is the external variable approach, in which statistical relationships are sought between specified nonverbal behaviors and other variables. Examples of these other variables include, the subject's personality characteristics, judgements of observers, and other nonverbal behavior in general.

Hall (1963, 1966), operating within the structural approach, coined the term "proxemics." Proxemics may be defined as the "interrelated observations and theories of man's use of space as a specialized elaboration of culture."

Spindler, in an editorial preview (Hall, 1963), construed proxemics as the study of how man unconsciously structures microspace.

In formulating a system for the notation of proxemic behavior, Hall (1963) used one group of American students and one group of Arab students in an encounter situation. His results indicated that the foreign students felt alienated. A common variety of alienation was "lack of involvement." Furthermore, foreigners often misinterpreted American responses and lacked, for the most part, the necessary skill essential for picking-up nonverbal cues.

Hall distinguishes among three types of spatial organization: fixed-feature, semifixed feature, and informal space. Fixed-feature space is that organized by unmoving boundaries. These boundaries may be either visible or invisible. Furthermore, fixed-feature space is one of the basic ways of organizing the activities of individuals and groups. Semifixed-feature space refers to the arrangement of movable objects. It is important to note that, what is semifixed-feature space in one culture may be fixed in another culture. Thus, specific aspects of interaction in a specified situation may be dependent upon <u>culture</u>. Lastly, informal space is perhaps the most significant for the individual because it includes the distances maintained

in encounters with others. These distances are, for the most part, outside of awareness.

Hall specifies four significant distances people maintain in encounters with others--intimate, personal, social, and public; each of which has a close and far phase. Consequently, how people are feeling toward each other at the time, is a decisive factor in the distance used in any particular encounter. Hence, the personal distance people maintain in any given situation is regarded as only one aspect of informal space. Similarly, Little (1965) designates personal space as "the area immediately surrounding the individual in which the majority of his interactions with others take place."

In a laboratory study designed to test Hall's impressions regarding the differences between Arabs and Americans on proxemic behavior, Watson and Graves (1966) maintained a threefold objective in: (1) recording empirical data quantifying Arab and American proxemic behavior, as was neglected by Hall, (2) pragmatically testing Hall's system for the notation of proxemic behavior, and (3) testing the validity of Hall's impressionistic observations on Arab and American differences. As was hypothesized, the Arabs and Americans were found to differ significantly in proxemic behavior--the Arabs interacting with each other closer and more directly than the Americans--with Hall's notational system fairing well.

Sommer (1959) distinguishes between the concept of personal space and that of territory. One of the primary distinctions is that, personal space is carried around, while territory is relatively stationary. Another of the significant differences is that, the boundaries of personal space are invisible, while those of territory are indeed visible to others. And to mention one other difference, personal space has the body as its center, while territory does not.

In an elaborate series of experiments conducted under as natural conditions as possible, Sommer located some very significant trends in nonverbal communication. In the first experiment of the series, he merely observed the behavior occurring in a large dining hall in a mental hospital. His main interest was in the specific chair or chairs (positions around a rectangular table) occupied by people who were interacting. Perhaps, the most significant pattern that emerged from this observational session is that, communication tended to take place between neighbors (adjacent chairs), and the corners of the table were the loci of most of the interactions. The remaining studies were more in the realm of active experimentation. Using homogeneous sex groups, Sommer asked the subjects to interact, these instructions afforded him the opportunity to observe the ways in which they arranged themselves. Again

the results indicated a corner-to-corner arrangement was facilitative for the most interaction. In additional studies in the series a decoy was employed. Both male and female confederates were used under varying conditions. The conditions were such that, each confederate sat in a specific chair around the table where either a lone male or female was seated. Conclusions drawn from this series indicated that females will sit closer to a female than to a male. This distance was closer than males would sit to decoys of either sex. And the males preferred the chair opposite the decoy in overwhelming numbers.

In another series of experiments designed to investigate one possible norm violation, that of sitting too close to another individual; Felipe and Sommer (1966) invaded the personal space of a group of patients at a state hospital. The patient's flight reaction, that is, his actual departure from his chair (or location prior to invasion) was the most obvious reaction to the intrusion.

The second study of this series took place in the library study hall of a large university. The room contained fourteen large tables arranged in two equal rows, with each table having six chairs. Each victim in this particular experiment was the first female found sitting alone with at least one book in front of her. The experimenter's task was to sit at the table and constantly

maintain one-of-five pre-decided upon experimental distances. No attempt was made to interact with the subject; in other words, the situation was kept as natural as possible. Sessions lasted for thirty minutes or less. That is, if the subject left before the end of the thirty minutes, then the total length of time she remained became the dependent variable. The results indicated that flight was the most clearly defined reaction, but many more subtle signs of the victim's discomfort were evident. The discussion illuminates the role of individual differences in studying proxemic behavior, especially in relation to more subtle stress-accommodation reactions.

Further interest in the area of nonverbal communication lead Sommer (1967) to design an experiment with group ecology as the major independent variable. The present study was an out-growth of two previously unmentioned experiments (Sommer, 1961 and 1962), in which he sent pairs of subjects into a large lounge where they could either sit side-by-side or across from one another to discuss designated topics; the results of which enabled him to designate an upper limit for comfortable conversation <u>under these specified conditions</u> of 5.5 feet. Moreover, the results of the present study indicated that spatial arrangement was a function of: (1) group task, (2) the degree of relationships of individuals, (3) personalities of the

individuals, and (4) the amount and kind of space available. Furthermore, the resulting arrangement consequently affects communication, friendship, and status differentiation between individuals. Similarly, Garfinkel (1964) reported that the violation of individual distance produced avoidance, bewilderment, and embarrassment; and that these effects were most pronounced among males.

Following in the tradition of ecological research, Sommer and Becker (1969) conducted another series of experiments attempting a systematic study of defensive procedures used in defending public space. Again, observation led the experimenters to notice that there appeared to be two styles by which students gained privacy in library or eating areas. One method was avoidance of the other person. The other method was offensive ownership of the entire area. The overall results of more methodical experimentation indicated that the use of space is affected by the location of walls, doors, and other physical barriers. Significantly, the use of markers (hats, coats, books, etc.) was found to be effective in reserving space in a public area, especially personal markers. Lastly, neighbors play an important part in legitimizing a system of space ownership.

Patterson, Mullens, and Romano (1971) examined the reaction to the immediacy (i.e., the cumulative effects of increasing proximity, touching, forward leaning, eye contact,

and directness of body orientation between interacting persons) of an intruder in a midwest university library. They predicted a compensatory reaction (i.e., a concious or unconscious reaction initiated by the individual in order to maintain comfortable level of intimacy or immediacy) would occur upon intrusion of ones personal space. Patterson, et al factorially combined four levels of the variable of immediacy with two levels of sex of the subject, resulting in eight conditions. The corresponding dependent variables included the total time the subject remained seated after intrusion, and the number of related compensatory reactions occurring during the ten-minute period. Each ten-minute period was divided into two five-minute periods in which case two of the experimenters alternated as rater and intruder. The results indicated a difference between the most immediate conditions and the remaining conditions. Noteably, flight was the most significant reaction to the most immediate condition, while more subtle compensatory reactions were prevalent during the other conditions of less proximity.

Two of the determinants of personal space, that of the individual's feeling state or psychological environment, and his personality characteristics were examined by Dosey and Meisels (1969). They hypothesized that "enviornmental or internal threats to self-esteem should produce

greater spatial distance;" in correspondence with the assumption that the perception of threatening elements in interpersonal situations is seen to call forth measures for self-protection. The Rorschach variable of body-image boundary was used to assess the anxiety level, and the degree to which subjects perceived their body-image boundaries as weak or unstructured.

Subjects were asked to sit close or far from the experimenter, and trace one silhouette in relation to another, as a means of measuring personal space. The stress condition involved having the subject's physical attractiveness called into question. Dosey and Meisels allowed the subjects in each group to witness one another's performance--a rather confounding procedure. Specifically, "modeling effects" tended to magnify the stress-nonstress difference in individual data. However, the results using group means did support the hypothesis of increased spatial distance under stress. Further results cautioned against the discussion of personal space without consideration of the method of assessment, as an extension of the fact that, little consistency was found in the use of the three experimental spatial measures. Lastly, the results did not support their predictions of relationships between personal space and the personality variables.

Altman and Haythorn (1967) examined social activity and "territorial" behavior for beds, areas of a room, and chairs in socially isolated dyads. They found that men in isolated groups showed a gradual increase in territorial behavior and a general pattern of withdrawl. They identified two significant personality variables as the need for affiliation, and the need for achievement. For instance, members of low affiliation groups tended to withdraw socially from one another and to exhibit high territorial behavior.

Eye Contact and Visual Interaction

Argyle and Dean (1965) closely examined the relationship between eye contact (EC), distance, and affiliation. Based on the assumption that one of the most important functions of EC in two-person encounters is to offer feedback on the reactions of one person to another; they postulated that "EC is linked to affiliative motivation, and that approach and avoidance forces produce an equilibrium level of physical proximity, eye contact, and other aspects of intimacy." Compensatory changes were thought to occur along the remaining dimensions when any one dimension was disturbed.

Eye contact is one of the most significant determinants of social interaction. For example, people usually look each other in the eye for periods of 3-10 seconds during social interaction. The common reaction to longer glances is anxiety.

Argyle and Dean identified several determinants of EC. Those determinants were: (1) Point in the Conversation--where they found more EC (typically, 2-1/2 or 3:1 ratio) when the subject was listening than when he was speaking; (2) Nature of the Topic--where it was discovered that more EC took place when the discussion topics were less personal and cognitively straightforward; (3) Individual Differences--where they indicated that women engaged in EC significantly more than men in a variety of situations; (4) Relations between a Pair of People--such that, if A likes B there is more EC, and if they are cooperating rather than competing. Conversly, there is less EC if there is tension in the relationship; and (5) The Developmental History of EC--where it has been shown that smiling responses by infants to certain aspects of the human face developes in the first weeks of life.

The functions of eye contact are such that it can have a variety of subjective meanings: friendship, sexual attraction, and hate to name a few.

Regarding the relationship between EC and an individual's striving for distance equilibrium, Argyle and Dean postulated that the equilibrium point for approach (considering the affiliative conflict theory of approach-avoidance forces) would be closer if the other person's eyes were shut. The results of the present experiment supported the above prediction. Moreover, subjects stood even closer to a photograph of a person than they did to the actual person. Children stood closer than adults in all conditions; that is, to a photograph of the experimenter, to the experimenter with his eyes open, and to the experimenter with his eyes shut. Further evidence indicated that greater proximity reduces eye contact.

In summary, one of the most important functions of eye contact is the quest for feedback during social interaction. Eye contact is also a component of intimacy, and is equivalent to physical proximity. Approach and avoidance forces govern these and other aspects of intimacy, and are kept in a state of equilibrium for any interacting dyad. By increasing the intimacy of the relationship, eye contact is reduced. Likewise, reducing eye contact makes greater proximity possible, and vice versa (Argyle & Dean 1965).

Argyle, Lalljee, and Cook (1968) designed another experiment to examine the effects of visibility on

interaction between two people. The procedure consisted of the experimenter interviewing the subject under seven different conditions of masking or obscuring the face. That is to say that, interaction took place under a normal (no mask) condition; one in which the experimenter wore dark glasses, a mask, or both; and one in which the subject wore either dark glasses, or a mask, or both. The dependent variable was the amount of comfort indicated by subjects on a post interview. Results indicated that decreased facial visibility produced a more comfortable state, while increased visibility of the other produced an even more comfortable state. Furthermore, at about 4 feet, self-concealment brought about more comfort, especially when males were observing females. At 10 feet, both sexes were comfortable being observed by males, but neither maintained the comfort state when viewed by a female. Ironically, females enjoyed their observation of either sex at a distance of 10 feet.

Exline, Gray, and Schuette (1965) conducted a similar study to that of Argyle, et al in which, sex of subject, sex of experimenter, interview content, and type of instructions were the major independent variables. Using this 2 x 2 x 2 x 2 factorial design, it was found that: (1) subjects when speaking looked at the experimenter significantly more during the innocuous interview

(i.e., where the content of the questions were of a personal nature); (2) female subjects looked or engaged in eye contact significantly more, regardless of the sex of the experimenter; (3) only sex differences were found in a post experimental discussion; and (4) female subjects were more affectionate towards experimenters. In general, subjects looked more at the interviewer when listening than when speaking.

Exline (1963) investigated the role of visual interaction in interpersonal communication. His study was designed in part to test the feasibility of collecting reliable data about visual interaction, and to test hypotheses about visual interaction in relation to selected personality and situational variables. The results of a pilot study (Exline, 1960) indicated that persons low in "n" affiliation (n AFF) differed markedly in visual behavior from those persons high in n AFF. However, further experimental evidence caused him to reject several of his hypotheses concerning the relationship between visual interaction and personality-situational variables. One clear-cut result was that, women were more prone to engage in visual interaction than men under almost any condition. Furthermore, the data suggested that sex and n AFF interact to affect the amount of mutual visual interaction in a particular dyad.

The results of Gibson and Pick (1963) suggest that we all have good discrimination for the line of gaze of another person, at least with respect to whether or not we are being looked at. Thus, the ability to read the eyes seems to be as good as the ability to read the fine print on an acuity chart.

Efran and Broughton (1966) sought to investigate the effect of expectancies for social approval on visual behavior. The hypotheses tested were derived from Rotter's (1954) social learning expectancy theory, which postulates that "the probability of a behavior's occurrence is a function of both a preference for certain reinforcements (more broadly needs) and a subjective probability (expectancy) that these reinforcements can be obtained in a given situation." Their results supported the hypothesis in which individuals, who were thought to have at least a moderate desire for visual approval or acceptance, engaged in more eye contact with one of two persons toward whom they had developed higher expectancies for social approval.

Steinzor (1950) found that the seating arrangement in a small face-to-face group helps to determine the individuals with whom one is likely to interact. Another factor likely to produce or inhibit interaction in a group was the total physical impression the individuals made on each other.

Dittmann and Llewellyn (1968) examined still another relationship in the general milieu of nonverbal communication, that between vocalizations and head nods as listener responses during a conversation. Further support was introduced for the postulate that participants in conversations look at their partners more while listening than while talking. Both vocalizations and head nods appeared to serve interpersonal functions and occurred more often than chance would predict. Interestingly enough, nods tend to occur slightly before a vocal response.

In a test of equilibrium theory of social interaction, Aiello (1972) investigated visual interaction in relation to orientation, distance, and sex of interactants. He found that, (1) females engaged in more visual interaction than males; (2) the relationship between distance and amount of "looking" and average glance length for males at two orientations was linear, while a curvilinear relationship between these variables was found for females in a face-to-face orientation; and (3) subjects, especially females, maintained longer glances when face-to-face. Aiello (1972) further examined male and female visual behavior as a function of distance and duration of an interviewer's direct gaze. Further validation regarding equilibrium theory was found for the checking, moderating, and affective-expressive functions of visual behavior during social interaction.

The Influence of Racial Characteristics on Social Interaction

In an experiment whose purpose was to describe the precise distance between two persons interacting in a natural setting, Willis (1966) found that the distances were related to the relationship between the individuals and their sex, age, and race. It was suggested that speaking distance be included as part of an operational definition of interpersonal relations. Specifically, relationships were classified as acquaintances, peers, friends, and close friends. A few of the more significant results indicated that: (1) Among whites and their peers, women approached more closely than men when initating conversation; (2) Student experimenters were approached more closely by their friends than by their parents, whose approach was similar to that of strangers; and (3) Both, blacks and whites stood further from blacks than from whites.

Although prejudice behavior (i.e., detrimental judgement, negative feelings causing prejudgement, etc.) is not the basic issue in question here, we would expect that anti-black or minority group feelings would have direct influence on the results of our study. It is therefore imperative to understand the relationship in which prejudice attitudes operate in relation to nonverbal behavior. Moreover, no attempt will be made at this time

to assess the degree of one's prejudice, other than a general distancing effect upon which this study is based.

Allport and Kramer (1946) attempted to identify some of the roots of prejudice. Their findings indicated that prejudice is a "life style" derived from early feelings of insecurity, from religiousness (or its lack), from early traumatic experiences, and from poor intercultural education. Using a rather lengthy questionnaire, they were able to cite several "real-world" influences on the establishment and maintenance of prejudice behavior directed from whites to blacks. For instance, most of the students in their study acknowledged having been influenced to some degree by their parents' attitudes on racial matters. Likewise, the influence of early school experiences contribute significantly to the degree of one's prejudice. That is, less prejudiced students reported favorable influences in their upbringing, as recalled from early memories; while those who were found to be more prejudiced tended to recall unfavorable school experiences or else deny that school had any influence upon them at all. The bigot suffers from a variety of negative influences that are so deeply embedded in his life style--are indeed, the life style itself--that positive pro-black, Jewish, Catholic, or whatever minority group attitudes are virtually unchangeable. For instance, the authors point-out that

the "bigots are particularly insensitive to the origin and nature of their own attitudes." Whereas, the more prejudiced person seems to have poorer insight into his prejudiced feelings; it would appear that the bigot has absolutely no insight into the environmental and developmental influences that are perpetuating his particular attitudes. Sex differences are significant, in that women appeared less prejudiced than men.

Verbal attitudes in relation to overt racial prejudice behavior was examined by Kutner, Wilkins, and Yarrow (1952). In a rather straightforward study, they sent two white women into a restaurant during meal-time. The women were instructed to ask for a table, be seated, and then to inform the waitress or whomever that they would be joined shortly by a third member. Immediately following this preliminary procedure, a black woman enters, and seats herself at the table. The second experimental condition involved telephoning various restaurants throughout the city, and requesting reservations for a party involving blacks. Not so surprisingly, the three women in the first condition were not subjected to any kind of discriminatory behavior. They reported that service was reasonable, and there was a noticeable absence of other discriminatory behavior. However, when attempts were made for phone reservations for a party involving blacks, managers overwhelmingly

made excuses for not confirming reservations or flatly denied them. A slight modification was made in the latter procedure, in which letters requesting reservations were substituted for the phone calls. The results, as might be expected, were quite similar. For the most part, none of the letters were answered. In conclusion, discriminatory treatment was minimized when challenged in a direct face-to-face situation, but when proposals to "violate" group norms are suggested, a greater degree of discriminatory behavior occurs.

In a study of ethnic attitudes and agreement with a black person, Berg (1966) arranged a social context "in which verbal measures were expected to predict behavior." The experimental situation was manipulated such that, a white subject was placed in a conflict situation as to agreement with either a black or white confederate on a task involving autokinetic judgement. Various measuring devices, such as selected "F" Scale items and a Social Distance Negro item were included in a questionnaire designed to assess the amount of anti-black feelings harbored by the subject. There appeared to be no significant correlations between the attitude scale scores and agreement with the black confederate. Furthermore, the results suggested that common verbal measures of attitudes toward black people may not be particularly valuable predictors of specific

social behavior toward a given black person. Moreover, it might be concluded that, a simple relationship does not exist between verbal measures of attitudes toward ethnic minorities and nonverbal social behavior directed toward any particular group. Apparently, situational factors are significantly influential in determining social action.

CHAPTER II

RATIONALE FOR THE INVESTIGATION

On the basis of the previous overview of theory and research on proxemic behavior, a rationale will now be presented for the hypotheses developed for this investigation.

Relationship Between Race and Time

Many whites in American society have perceptions of blacks and other minority groups that differ markedly from the perceptions they have of themselves as members of the dominant sub-cultural group with regards to basic values, sexual mores, inate intelligence, and so on. For the most part, whites tend to perceive other sub-cultural groups in an atmosphere of negative emotionality. Primarily, it is this negative emotional attitude and often gross lack of information regarding the life-style of such groups that leads whites to distrust members of most minority groups. It is this lack of trust that most often gets translated,

psychologically speaking, into some sort of "threat." This threat is then something to be acted upon or reacted to, either through flight or aggression. Many minority groups, and particularly blacks, are most often perceived by whites as sources of threat. Moreover, we suggest that all sub-cultural groups in this society will be perceived as a source of threat to a lesser extent than will blacks. It is our contention that whites will perceive orientals as moderately threatening, based on skin color and other racial characteristics.

In general, much of the literature on the nature of nonverbal behavior suggests that the more threatening a person is perceived the less others will chose to interact with that person, i.e., the greater the distance others will maintain between themselves and that person or group of persons. It is therefore hypothesized that:

I. Subjects whose personal space is invaded by a black experimenter maintain less time in the situation than if invaded by an oriental or white experimenter respectively.

Relationship Between Distance and Time

Hall (1966) suggests that there are four distance zones within which people interact: intimate, personal,

social, and public. We have chosen to study the lower and intermediate boundaries of the personal distance zone. It was our assumption that persons who approached the more intimate zone (6 inches) would be perceived as more threatening than persons who maintained considerably more distance (48 inches) while interacting on a nonverbal level. It is therefore hypothesized that:

> II. The closer the experimenter sits to the subject the less time the subject will remain in the invasion situation.

Relationship Between Subject Placement and Time

The work of Sommer and Becker (1969) and personal intuition as to the amount of physical energy required to remove oneself from personal space invasion led us to suspect that persons would react differentially, depending on where they were sitting, in relationship to other persons or objects in the immediate physical environment. Specifically, it was construed that less energy is required to leave a table when seated in an end chair rather than a middle chair which is flanked on both sides by still another chair. Hence, it is hypothesized that:

> III. When the subject is seated in an end chair at a table she will tolerate personal space invasion for less time than when she is seated in a middle chair.

Relationship Between Defensive Behavior and Time

Other suggestions of Sommer and Becker (1969) led us to attune to the amount of defensive behavior that subjects probably would display as a compensatory reaction to personal space invasion. Hence, it is hypothesized that:

> IV. The longer the subject remains in the invasion situation, the more she will display defensive-like behavior as a means of compensating for the discomfort of the situation.

CHAPTER III

METHOD

Design

A 3 x 2 x 2 x 2 factorial design was employed. The relative dimensions were (1) race of experimenter; (2) sex of experimenter; (3) distance between experimenter and subject, i.e., experimenter placement; and (4) position of subject, i.e., subject placement. The relevant attributes were Negro-Caucasian-Oriental, i.e., black-white-oriental; male-female; close-far, i.e., 6 inches-48 inches; and end seat-middle seat.

Subjects

The invasions took place in the main library at Michigan State University. All Ss were white females. A suitable S for invasion was one who was seated alone at one of the six-chaired (three on each side) rectangular library tables and appeared settled. For example, the S might be reading, writing a term report, or engaged in some similar study-related activity.

Experimenters

There were a total of 31 Es. The race by sex composition of the experimenter groups was as follows: 3 black males, 5 black females, 6 white males, 8 white females, 5 oriental males, and 4 oriental females. Each E invaded a total of 12 individual Ss, i.e., 3 Ss at the close distance-end position, 3 Ss at the close distance-middle position, 3 Ss at the far distance-end position, and 3 Ss at the far distance-middle position.

Procedure: Experimenter Tasks

The invasion consisted of the E casually seating himself either adjacent to (close distance = 6 in.) or directly across from (far distance = 48 in.) the S who was seated in either an end or middle seat. The E did not initiate any form of conversation with the subject, nor did he continually stare at her. The Es were instructed to take a brief glance (approximately 3 seconds) at the S at 3 minute intervals.

The Es operated in two-man teams. While one E performed the invasion, the other recorded the amount of defensive behavior (on a scale from 1 to 5, with 1 indicating the least and 5 the most amount of defensive

behavior displayed) that took place during the invasion. The recording E also kept track of the time (to the nearest minute) that the S remained in the situation. The E who acted as recorder seated himself a short distance away from the table where the invasion was occurring. The maximum time that Es maintained the invasion was 15 minutes.

Flight

In this specific situation, flight was considered to have occurred when--for whatever reason--the subject left the table or, more precisely, the invasion situation while the invasion was taking place. Our hypothetical definition of flight would necessarily encompass many routine activities that one is likely to perform in a library while presumably studying. For instance, going to get a drink of water, leaving to check-out a book, talk to a friend, get a cup of coffee, and so on would all be activities construed and recorded as flight. As a point of emphasis, once flight had occurred, the invasion was terminated. Any subject who returned to the situation did not negate the fact that flight had occurred, and that the invasion had terminated.

Invasion Conditions

The target invasion situation consisted of two conditions (C_1 and C_2). The first condition (C_1) was that in which the subject was seated in one of the end chairs at an empty library table. The second condition (C_2) consisted of the subject having been seated in a middle chair at an empty table (i.e., two invasions could not take place simultaneously at the same table).

Figure 1 depicts the subject (S) and experimenter (E) placements (i.e., one possible seating arrangement) for invasion Condition 1, i.e., end seat S placement at the close and far E invasion distances. Thus, invasion would necessitate that the experimenter occupy the end chair on the opposite side of the table to satisfy the far distance experimenter placement requirement or the middle chair on the same side of the table to satisfy the near distance requirement.

Figure 2 depicts the subject (S) and experimenter (E) placements for invasion Condition 2, i.e., middle seat S placement at the close (alternatives E_1 and E_2) and far E invasion distances. Hence, the experimenter would necessarily have had to seat himself in a middle chair on the opposite side of the table to satisfy the far experimenter distance requirement or occupy one-of-two alternative

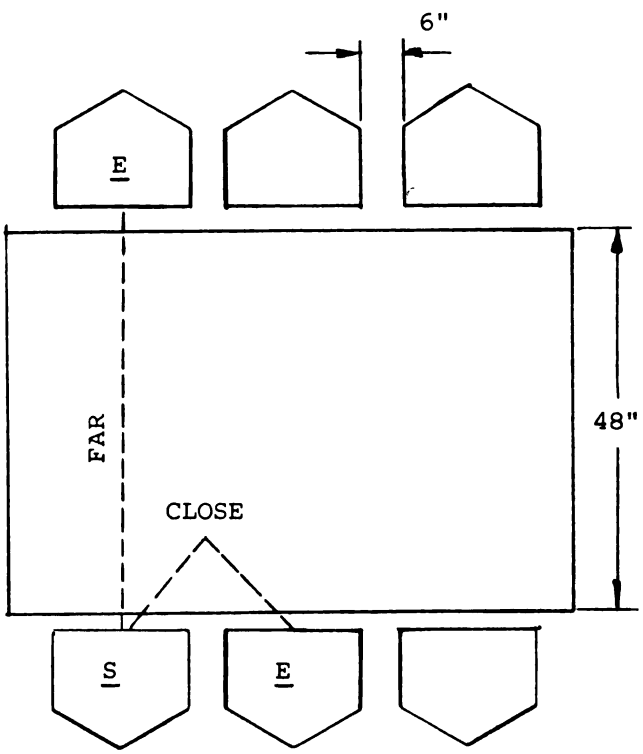

Fig. 1.--Condition 1 Seating Arrangement: End Seat Subject Placement at the Close and Far Experimenter Invasion Distances.

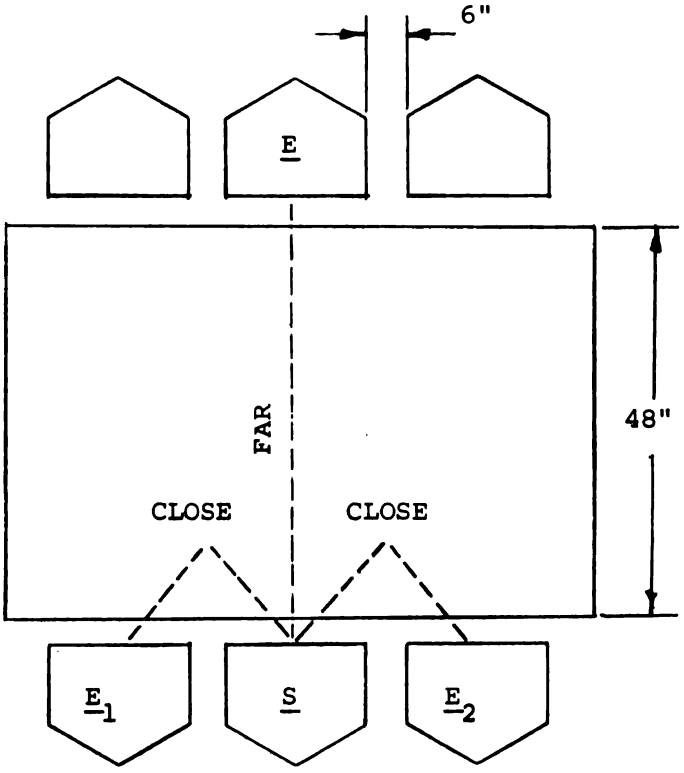

Fig. 2.--Condition 2 Seating Arrangement: Middle Seat Subject Placement at the Close and Far Experimenter Invasion Distances.

end chairs on the same side of the table to satisfy the near distance requirement.

The purpose for separating the target situation into two conditions was constructed as a difference in the amount of space required for the subject to avoid invasion. That is to say, when the subject was seated in the end-chair position he merely had to orient himself 90 degrees to the left or right (depending on which end of the table he was seated) and he would have removed himself from the invasion--defensively, i.e., his back would be turned to the side of the experimenter who was facing head-on; or it would only take one step to remove himself completely from the situation--flight. Whereas, if the subject was seated in a middle chair, a similar defensive maneuver would require a full 180 degree turn. However, from this point, flight would necessarily still involve only one step. Thus, the main difference between the two conditions is in angle-degrees and subsequent amount of effort required to re-orient the body in preparation for flight.

Once flight occurred or 15 minutes had lapsed (whichever occurred first) the invasion was considered terminated. No mention of the experiment or the subject's participation in an experiment was made to the subject. In essence, the experimenter who had performed the invasion stopped reading and immediately left the table. This was

particularly important when flight did not occur. The reason being that there was no real means of assessing the anxiety generated by the invasion. It was our desire to keep such anxiety at a minimum whenever possible.

Data Analysis

Multivariate analysis of variance (MANOVA) was employed in the statistical analysis of the data (Graybiel, 1961; Morrison, 1967).

CHAPTER IV

RESULTS

The experimental design was such that experimenters were nested within race and sex categories. In an attempt to determine whether experimenters differed significantly from each other, multivariate ANOVA was utilized. No significant experimenter effects ($F=1.09$, 12/215 df; n.s.) were found. Because no significant experimenter differences were found due to nesting, data from all combinations of race, sex, distance, and position variables were used to generate the 3 x 2 x 2 x 2 factorial design upon which these findings are based.

A significant four-way race by sex by distance by position ($F=3.14$, $p<.04$; 2/348 df) interaction was found. A significant main effect for distance ($F=7.59$, $p<.006$; 1/348 df) was also found. Due to the difficulty in interpreting these findings, subsequent statistical computations were employed for each race of experimenters, i.e., blacks, whites, and orientals (see Table 1).

TABLE 1

MEAN TIME BY RACE, SEX, DISTANCE, AND POSITION

	Black Experimenters			
	Males		Females	
	Close	Far	Close	Far
End	12.6 (n=9)	13.0 (n=9)	11.9 (n=15)	11.8 (n=15)
Middle	13.8 (n=9)	9.2 (n=9)	11.1 (n=15)	13.1 (n=15)
	White Experimenters			
End	13.1 (n=18)	14.4 (n=18)	13.8 (n=24)	13.3 (n=24)
Middle	11.7 (n=18)	13.2 (n=18)	12.9 (n=24)	12.8 (n=24)
	Oriental Experimenters			
End	13.7 (n=15)	12.3 (n=15)	14.3 (n=12)	15.0 (n=12)
Middle	11.8 (n=15)	12.5 (n=15)	11.7 (n=12)	12.0 (n-12)

Black Experimenters

A significant three-way sex by distance by position ($F=4.64$, $p<.03$; 1/88 df) interaction was found. No other significant interactions or main effects were observed.

Table 1 shows the mean time for each race, sex, distance (experimenter placement), and position (subject placement). Observation of this data revealed a strong time by distance by position interaction for black males, which tended to support Hypothesis II. Subjects (Ss) spent less time in the end position when experimenters (Es) were close ($\bar{X}$=12.6 min.) rather than far ($\bar{X}$=13.0 min.). However, the more powerful situation appeared to be that in which S was seated in the middle chair and E was seated directly opposite her (close, $\bar{X}$=13.8 min. vs far, $\bar{X}$=9.2 min.). This latter trend did not support either Hypothesis II or Hypothesis III, in the case of black males.

A similar three-way time by distance by position interaction was found for black females. When S was seated in the end chair, far experimenter placement elicited slightly less mean time ($\bar{X}$=11.8 min.) than did close experimenter placement ($\bar{X}$=11.9 min.). In this specific situation, Hypothesis II was not supported. But when S was seated in the middle chair, she spent significantly less time at the table when E was close ($\bar{X}$=11.1 min.) rather than far ($\bar{X}$= 13.1 min.). These results clearly supported Hypothesis II.

Hypothesis III, which predicted that Ss spend less mean time in the end position than in the middle position, was supported (end, $\bar{X}$=11.9 min. vs middle, $\bar{X}$=12.1 min.).

Hence, Hypothesis II was supported when black male Es were seated close to Ss who sat at the end of the table, but not for those who sat in a middle chair. In contrast, black females elicited the exact opposite results. Middle seating by S and close E placement revealed supporting findings for Hypothesis II; while the end arrangement did not. Comparison of end and middle seating revealed supporting evidence for Hypothesis III. Ss spend less time in the end situation than in the middle, when invaded by a black female experimenter.

Absolutely no support was found for Hypothesis IV, which predicts that Ss who chose to remain in the invasion situation will exhibit compensatory defensive behavior.

White Experimenters

A significant main effect for distance ($F=3.41$, $p<.06$; 1/160 df) was found. Analysis of the mean time by distance and position data for white males (see Table 1) supported Hypothesis III, which predicted that Ss spend less time in the end position than in the middle position.

However, Hypothesis II was not supported for either subject placement, i.e., end vs middle.

Neither Hypothesis II nor Hypothesis III were supported in the case of white female experimenters. Basically, there was no difference across conditions for this sub-group of experimenters.

For white experimenters, each of the ten defensive behavior variables (except one) were significant at the level of $p<.001$. Each E rated each S on the amount of defensive behavior that took place during each invasion trial. Ss were rated on a scale from 1 to 5, with 1 indicating the least amount and 5 indicating the most amount of defensive behavior (see Appendix). An analysis of each variable, including the mean scale rating for both males and females, supported Hypothesis IV, which predicts a compensatory relationship between the time spent in the invasion situation and the amount of defensive behavior exhibited per trial.

Table 2 shows that Ss exhibited a greater amount of defensive behavior along every variable while in the presence of a white male E as opposed to a white female E. Only the item reading, "Subject shields eyes with hand/s, book, etc." was not significant.

Across conditions, no significant time difference was found between male ($\bar{X}$=13.1 min.) and female ($\bar{X}$=13.2 min.) Es. Hence, Hypothesis IV which predicts that subjects

TABLE 2

MEAN SCALE RATINGS ON DEFENSIVE BEHAVIOR ITEMS
(White Experimenters)

	Item	Males	Females
1.	Subject fidgets in his chair.	2.5	1.7
2.	Subject generally appears anxious, nervous, etc.	2.6	1.5
3.	Subject turns his back to the experimenter.	1.8	1.0
4.	Subject puts books, coat, or other object/s between himself and the experimenter.	1.8	1.1
*5.	Subject shields eyes with hand/s, book, etc.	1.9	1.8
6.	Subject keeps his head buried.	2.1	1.2
7.	Subject crosses arms on chest.	1.7	0.9
8.	Subject continually stares at the experimenter.	2.3	1.1
9.	Subject appears annoyed.	2.4	1.4
10.	Subject initiates conversation.	1.8	1.0

*=$p<1$ (Remaining items significant $p<.001$)

will compensate for invasion discomfort through the use of defensive behavior is clearly supported--especially for white males.

Oriental Experimenters

A significant main effect for distance ($F=5.76$, $p<.01$; 1/100 df) was found. Analysis of the mean time by distance and position data for oriental males revealed a strong interaction in the direction of Hypothesis II (see Table 1). Subsequent analysis suggested that when Ss were in the end chair they tolerated spacial invasion less when Es were far ($\bar{X}=12.3$ min.) rather than close ($\bar{X}=13.7$ min.). But, Hypothesis II, which predicted that close invasion trials would elicit less mean times than far invasion trials, was supported for the middle position. Ss spent less time in the middle position when E was close ($\bar{X}=11.8$ min.) rather than far ($\bar{X}=12.5$ min.).

Mean time by distance and position data for oriental females did not support Hypothesis II for either the end or middle position. However, Hypothesis III, which predicts that less time will be spent in the end rather than the middle position, was supported. The mean time for the end position, for both the close and far distance, was 13.0 min.; while the middle position revealed a mean time of 13.5 min.

Along the distance dimension, "subjects turn their backs to the experimenter" to a significant degree ($F=23.89$, $p<.001$; 1/100 df). The mean scale rating for the close attribute was 0.9; while the mean rating for the far attribute was 1.9. Hence, when oriental Es sat across the table from Ss, Ss tended to minimize the discomfort by turning their backs to Es; and they did so to a greater extent than when Es sat next to Ss on the same side of the table.

Several defensive behavior variables were found significant along the sex dimension, though no main effect for sex was found. The following variables tended to cluster around $p<.001$ level of significance: (a) Subject generally appears anxious, nervous, etc. (males, $\bar{X}=2.3$; females, $\bar{X}=1.5$); (b) Subject crosses arms on chest. (males, $\bar{X}=1.3$; females, $\bar{X}=0.6$); (c) Subject continually stares at the experimenter. (males, $\bar{X}=1.6$; females, $\bar{X}=1.0$); (d) Subject initiates conversation. (males, $\bar{X}=1.3$; females, $\bar{X}=0.6$).

At the significance level of $p<.04$, it was found that: (a) Subject fidgets in his chair. (males, $\bar{X}=2.3$; females, $\bar{X}=1.8$); and (b) Subject shields eyes with hand/s, book, etc. (males, $\bar{X}=2.5$; females, $\bar{X}=2.0$).

Across conditions, without exception, more defensive behavior was exhibited when Ss were invaded by oriental males than when invasions were performed by oriental females. These results lend support for Hypothesis IV,

which predicts that Ss will minimize the discomfort of personal space invasion through the utilization of defensive behavior as a means of psychological compensation.

Tests for Hypotheses

Analysis of mean times per racial group generally supported Hypothesis I, which predicted that blacks would elicit the lowest mean times--across conditions, with orientals eliciting slightly higher mean times, and whites eliciting the highest mean times of all. This rank-order effect was observed.

Table 3 shows the mean times for each racial group of experimenters. Means are shown for males, females, and the group as a whole. Blacks revealed a mean time of 12.1 min., for orientals the mean time was 13.0 min., and for whites the mean time was 13.1 min. These data support the main hypothesis of this study.

Hypothesis II predicted that close invasions would elicit less mean times across conditions than would far invasions. Though the data tended to support this prediction, no significance was obtained.

Hypothesis III predicted that Ss who were seated at the end of the table when invasion occurred would tolerate the discomfort of the situation for less time when

seated in a middle chair. The mean times for the end and middle positions did not support this prediction.

TABLE 3

MEAN TIME BY RACE AND SEX

Race	Sex	Mean	Grand Mean
Black	Males	12.1	12.1
	Females	12.0	
White	Males	13.1	13.1
	Females	13.2	
Oriental	Males	12.7	13.0
	Females	13.3	

TABLE 4

MEAN TIME BY RACE, SEX, AND POSITION

Race	Sex	End	Middle
Black	Males	12.5	12.5
	Females	11.9	12.1
White	Males	13.8	12.5
	Females	13.6	12.9
Oriental	Males	13.0	12.2
	Females	13.6	12.9
Grand Mean		13.1	12.4

It was found that Ss stayed less time in the middle position ($\bar{X}$=12.4 min.) than in the end position ($\bar{X}$=13.1 min.). Overall, the findings were opposite those predicted. Black females did however exhibit the desired results (end, $\bar{X}$=11.9 min.; middle, $\bar{X}$=12.1 min.).

Hypothesis IV predicted a direct relationship between the time spent in the invasion situation and the amount of defensive behavior exhibited. This prediction was clearly supported.

Figure 3 depicts the general linear relationship between mean time and defensive behavior for each racial group of Es. Overall, blacks elicited the lowest mean times ($\bar{X}$=12.1 min.) and no defensive behavior variables were found significant. Orientals had a mean time of 13.00 minutes, with 4 significant variables. The mean time for whites was the highest of the three groups ($\bar{X}$=13.1 min.) and 9 out of the 10 variables were found to be significant ($p<.001$). These findings support Hypothesis IV which predicted a compensatory phenomenon.

Summary of Results

In general, the results supported Hypothesis I, which predicted that blacks would elicit lower mean times than orientals and whites with respect to rank-order. The

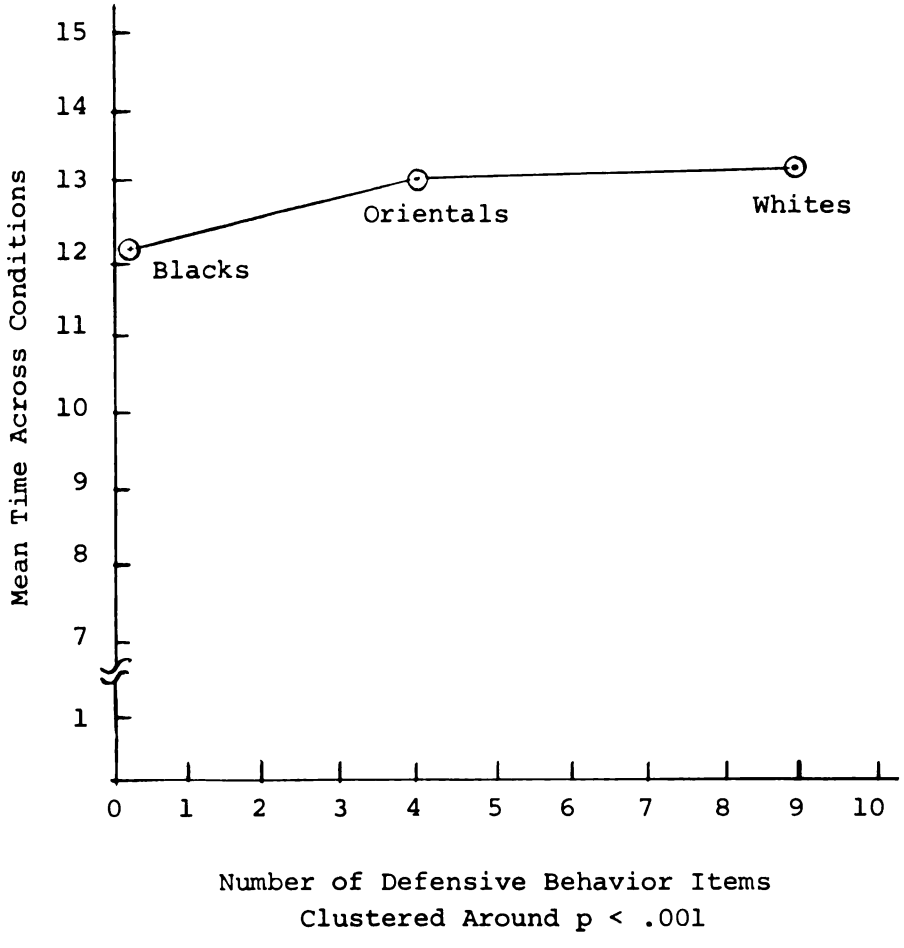

Fig. 3.--Linear Relationship Between Mean Time by Race and Defensive Behavior Items.

findings also supported Hypothesis II, which predicted that close invasion trials would elicit lower mean times than far invasion trials. Hypothesis III which predicted that end seat subject placement would elicit lower mean times than middle seat subject placement was not supported. The opposite effect was in fact found. Clear support was found for Hypothesis IV which predicted a compensatory relationship between the amount of time spent in the invasion situation and the amount of defensive behavior displayed.

CHAPTER V

DISCUSSION AND SUMMARY

The findings of this study suggest that when white females, while studying in the university library, are approached by either a black male or a black female, they remain in the situation for less time than when approached by either an oriental or a white person. Moreover, they tend to take flight (i.e., leave the situation) rather than remain and display apparent discomfort. The most threatening or anxiety arousing situation seems to be that in which a black male sits directly across from a white female. Similarly, the situation where a black female sits next to a white female is a high arousal situation.

Oriental males also appear to be more threatening when seated across from white females; while oriental females tend to arouse the most anxiety when seated near the subject. Though subjects tend to remain in these two situations the same amount of time, defensive behavior was displayed to a much greater extent when oriental males were present.

When white female students are approached by white males or females, they tend to remain in the situation for about the same length of time. However, subjects tend to display defensive behavior differentially to the two sexes. Interestingly, white females tend to remain in the situation about the same length of time, when approached by either a white male or a white female; but, when approached by a white male they display almost twice as much defensive behavior--to a significant degree. It seems quite clear that white males arouse the most anxiety in white females. Perhaps, sexual attraction is the primary anxiety arousing agent. It would follow that white females stay in the situation longer, when confronted by white males, for some ulterior motive--perhaps entertaining the possibility of establishing some sort of friendship relationship. Moreover, unlike either black males or oriental males, white males seemingly pose more of a threat when seated close to the subject rather than across the table; while just the opposite effect is observed for white female experimenters.

It would appear that white female subjects "freeze" more when approached by a member of their own race, but display greater amounts of defensive behavior. On the other hand, subjects chose to leave the situation when approached by members of another racial group--rather than remain and display signs of nervousness, anxiety, disgust, and the like.

Contrary to what we would expect, subjects remained longer with oriental females than with any other group of experimenters. In general, the oriental females used in this study were petite in physical stature, and perhaps this size dimension accounted for the non-threatening nature of these invasion trials.

With regard to the defensive behavior items, whites provoked significantly greater reactions than did any other racial group. However, oriental experimenters provided information which was somewhat different from what we expected. For instance, it seems intuitively obvious that the two defensive behavior items, (1) Subject fidgets in his chair, and (2) Subject generally appears anxious, nervous, etc. relate to each other along a "nervous-anxiety" dimension. Likewise, we would expect the following items to cluster on a loosely defined "physical blocking" dimension: (3) Subject turns his back to the experimenter; (4) Subject puts book/s, coat, or other object/s between himself and the experimenter; (5) Subject shields eyes with hand/s, book, etc.; (6) Subject keeps his head buried; and (7) Subject crosses arms on chest. However, like significance was found for (1) Subject fidgets in his chair and (5 rather than 2) Subject puts book/s, coat, or other object/s between himself and the experimenter. In the same manner, (2) Subject generally appears anxious, nervous, etc.

clustered with (7) Subject crosses arms on chest; and two seemingly unrelated items (8) Subject continually stares at the experimenter; and (10) Subject initiates conversations. Thus, white female subjects when approached by an oriental experimenter in these specific situations, reacted differently along seemingly different dimensions of defensive behavior. Perhaps "the wish not to offend" is the most prominent reaction. That is to say that it doesn't quite follow that moderately anxious or threatened subjects would initiate conversation with the person causing the discomfort--unless conversation is used as an information seeking device. If this is so, then the initiation of conversation serves a dual function. First, it lessens the anxiety of the subject because she now has more information upon which to decide whether or not to remain in the situation. And second, it serves as a "safety valve" whereby the subject can leave the situation without feeling guilty, shameful, or having offended someone--afterall, attempts were made to converse with the person.

Conclusions and Implications for Future Research

1. Some light has been cast upon the relationship between race and time with regards to

personal space invasion. White female subjects utilized in this investigation responded differentially to non-white experimenters. Due to the rank-order effect that was found between blacks, orientals, and whites respectively; it is suggested that future research attempt to assess to what degree other non-white sub-cultural ethnic groups will be perceived as threatening to whites.

2. Since only white female subjects were used in this study it follows that this specific methodology might be utilized with white males as subjects. We would hypothesize that the intensity or significance of time would decrease across similar conditions as those investigated in this study, with a compensatory decrease in the amount of defensive-like behavior displayed (linear model).

3. More attention needs to be devoted to the kinds of defensive behaviors that people display in reaction to psychological threat. Our findings suggest for instance that

conversation may be one mechanism whereby one can reduce the anxiety specifically associated with personal space invasion. An attempt should be made to identify other such mechanisms.

4. Personal space has become an abundantly rich source of psychological data which has found favor among many contemporary researchers. However intimate space, and to a lesser extent, social and public space have been relatively neglected as equally rich sources of data. Ethical considerations of course limit the futility of intimate spacial invasion. However, the social distance zone could prove to be quite rewarding in aiding to identify behavioral dynamics exclusive to this specific zone, and to the general nature of nonverbal behavior.

5. In this investigation white females remained in the invasion situation for about the same length of time when approached by either a male or female experimenter of the same race. However, twice as much defensive behavior was displayed with males than with females.

Attempts to discover the subjects rationale for maintaining an apparently discomforting situation should be investigated--perhaps a questionnaire is most appropriate for this task.

BIBLIOGRAPHY

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Aiello, J. R. A test of equilibrium theory: Visual interaction in relation to orientation, distance, and sex of interactants. Psychonomic Science, 1972, 27, 335-336.

Aiello, J. R. Male and female visual behavior as a function of distance and duration of an interviewer's direct gaze: Equilibrium theory revisited. Unpublished doctoral dissertation. Michigan State University, 1972.

Allport, G. W. and Kramer, B. M. Some roots of prejudice. Journal of Psychology, 1946, 22, 9-39.

Altman, I. and Haythorn, W. The ecology of isolated groups. Behavioral Science, 1967, 12, 169-182.

Argyle, M. and Dean, J. Eye contact, distance, and affiliation. Sociometry, 1965, 28, 289-304.

Argyle, M., Lalljee, M., & Cook, M. The effects of visibility on interaction in a dyad. Human Relations, 1968, 21, 3-17.

Berg, K. R. Ethnic attitudes and agreement with a Negro person. Journal of Personality and Social Psychology, 1966, 4, 215-220.

Dittman A. T. and Lewellyn, L. G. Relationship between vocalizations and head nods as listener responses. Journal of Personality and Social Psychology, 1968, 9, 79-84.

Dosey, M. A. and Meisels, M. Personal space and self protection. Journal of Personality and Social Psychology, 1969, 11, 93-97.

Duncan, S., Jr. Nonverbal communication. Psychological Bulletin, 1969, 72 (2), 118-137.

Efran, J. S. and Broughton, A. Effect of expectancies for social approval on visual behavior. Journal of Personality and Social Psychology, 1966, 4, 103-107.

Exline, R. V. Effects of sex, norms, and affiliation motivation upon accuracy of interpersonal preferences. Journal of Personality, 1960, 28, 397-412.

Exline, R. V. Explorations in the process of person perception: Visual interaction in relation to competition, sex, and need for affiliation. Journal of Personality, 1963, 31, 1-20.

Exline, R. V., Gray, D., & Schuette, D. Visual behavior in a dyad as affected by interview content and sex of respondent. Journal of Personality and Social Psychology, 1965, 1, 201-209.

Felipe, N. and Sommer, R. Invasion of personal space. Social Problems, 1966, 14, 206-214.

Garfinkel, H. Studies of the routine grounds of everyday activities. Social Problems, 1964, 11, 225-250.

Gibson, J. J. and Pick, A. D. Perception of another person's looking behavior. American Journal of Psychology, 1963, 76, 386-394.

Graybiel, F. A. An introduction to linear statistical models, volume 1. New York: McGraw-Hill, 1961.

Hall, E. T. A system for the notation of proxemic behavior. American Anthropologist, 1963, 65, 1003-1026.

Hall, E. T. The hidden dimension. Garden City, N.Y.: Doubleday, 1966.

Kutner, B., Wilkins, C., & Yarrow, P. R. Verbal attitudes and overt behavior involving racial prejudice. Journal of Abnormal and Social Psychology, 1952, 47, 649-652.

Little, K. B. Personal space. Journal of Experimental Social Psychology, 1965, 1, 237-247.

Morrison, D. F. Multivariate statistical methods. New York: McGraw-Hill, 1967.

Patterson, M. L., Mullens, S., & Romano, J. Compensatory reactions to spatial intrusion. Sociometry, 1971, 34, 114-121.

Rotter, J. B. Social learning and clinical psychology. Englewood Cliffs, N. J.: Prentice-Hall, 1954.

Sommer, R. Studies in personal space. Sociometry, 1959, 22, 247-260.

Sommer, R. Leadership and group geography. Sociometry, 1961, 24, 99-110.

Sommer, R. The distance for comfortable communication: A further study. Sociometry, 1962, 25, 111-116.

Sommer, R. Small group ecology. Psychological Bulletin, 1967, 67, 145-152.

Sommer, R. and Becker, F. D. Territorial defense and the good neighbor. Journal of Personality and Social Psychology, 1969, 11, 85-92.

Steinzor, B. The spatial factor in face-to-face discussion groups. Journal of Abnormal and Social Psychology, 1950, 45, 552-555.

Watson, O. M. and Graves, T. D. Quantitative research in proxemic behavior. American Anthropologist, 1966, 68, 971-985.

Willis, F. N. Initial speaking distance as a function of the speakers' relationship. Psychonomic Science, 1966, 5, 221-222.

APPENDIX

DEFENSIVE BEHAVIOR RATING SHEET

APPENDIX

DEFENSIVE BEHAVIOR RATING SCALE

Subject seated in _____ end or _____ middle seat.

Experimenter seated in _____near or _____ far seat.

Flight _____ did or _____ did not occur.

Total time lapsed _____ minutes.

Rate on a scale from 1 to 5 with 1 indicating the least amount and 5 indicating the most amount of defensive behavior.

1.	Subject "fidgets" in his chair.	1 2 3 4 5
2.	Subject generally appears anxious, nervous, etc.	1 2 3 4 5
3.	Subject turns his back to the experimenter.	1 2 3 4 5
4.	Subject puts books, coat, or other object/s between himself and the experimenter	1 2 3 4 5
5.	Subject shields eyes with hand/s book, etc.	1 2 3 4 5
6.	Subject keeps his head buried.	1 2 3 4 5
7.	Subject crosses arms on chest.	1 2 3 4 5
8.	Subject continually stares at the experimenter.	1 2 3 4 5
9.	Subject appears annoyed.	1 2 3 4 5
10.	Subject initiates conversation.	1 2 3 4 5

NOTES:_____

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