

INTERPERSONAL DISTANCING  
BETWEEN UNDERGRADUATE COLLEGE STUDENTS  
AND THEIR INSTRUCTORS

---

A Dissertation  
Presented to  
the Faculty of the Graduate School  
University of Houston

---

In Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Education

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by  
Marie Dalton  
August 1977

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## ABSTRACT

The intent of the present research was to study variables associated with the dimension of nonverbal communication called proxemics and especially interpersonal distance. This dimension has been studied frequently outside the classroom but has been for the most part ignored as an area of research within the classroom. Yet, such information is greatly needed. Because of the nature of courses taught and teaching methods used, instructors are frequently working individually with students at very close range. Instructors are not always aware of the effect this proximity produces in the student. If instructors are to maintain an effective instructional climate, they must recognize student spatial boundaries. Since close physical proximity may produce defensive behaviors and defensive behaviors may be disruptive to learning, instructors must be aware of the combination(s) of variables which produce(s) the need for increased interpersonal distance in instructor-student interactions.

The investigation herein is concerned with Duke and Nowicki's concept of interpersonal distance:

An infinite series of oscillating rings represented in all planes (thus forming a globe). These rings are not necessarily circular but may be ovoid or elliptical. . . . These rings expand and contract, distances increase or decrease, as functions of . . . numerous systematically manipulable, predictable, and measurable factors.  
(Duke & Nowicki, 1972, p. 120)

Factors which have been found to relate to the construct proxemics include race, sex, status, and affiliation. The possibility exists that these may be operating variables in the college classroom.

The six hypotheses studied were:

1. Students will maintain less distance from their instructors in interactive classes than in lecture classes.

2. Students will maintain less distance from female instructors than from male instructors.

3. Students will maintain less distance from black instructors than from white instructors.

4a. White students will maintain less distance from instructors than will black students; and

4b. Male students will maintain less distance from instructors than will female students.

5. Students will maintain less distance from instructors of the same race than from instructors of a different race: (a) white students will permit white instructors closer than black instructors, and (b) black students will permit black instructors closer than white instructors.

6. Students will maintain less distance from instructors of the opposite sex: (a) male students will permit female instructors closer than male instructors, and (b) female students will permit male instructors closer than female instructors.

A demographic questionnaire and the modified Comfortable Interpersonal Distance scale were administered to subjects a class at a time;

all subjects received the stimuli in the same order. Next, scores for interpersonal distance between undergraduate college students and instructors were obtained by measuring, in millimeters, the distance indicated by the subjects on the CID; i. e., the distance between the point where the student was "sitting" and the mark made by the student on the scale.

The data from the CID were analyzed by performing an analysis of variance with repeated measures on three variables; when an interaction was found to be significant, Tukey's Honestly Significant Difference Test was done to investigate specific hypotheses.

### Summary of the Findings

Hypotheses accepted were the following:

Hypothesis 1. Students will maintain less distance from their instructors in interactive classes than in lecture classes.

Hypothesis 2. Students will maintain less distance from female instructors than from male instructors.

Hypothesis 3. Students will maintain less distance from black instructors than from white instructors.

Hypothesis 4.(a) White students will maintain less distance from instructors than will black students.

Hypothesis 5.(b) Black students will permit black instructors closer than white instructors.

Hypothesis 6.(a) Male students will permit female instructors closer than male instructors.

Hypotheses not supported were the following:

Hypothesis 4.(b) Male students will maintain less distance from instructors than will female students.

Hypothesis 5.(a) White students will permit white instructors closer than black instructors.

Hypothesis 6.(b) Female students will permit male instructors closer than female instructors.

The interactions not hypothesized but found to be significant were the following:

- race of student by sex of instructor;
- race of instructor by sex of instructor;
- race of student by sex of student by sex of instructor;
- race of student by sex of student by mode of instruction;
- race of student by race of instructor by sex of instructor; and
- race of student by sex of student by race of instructor by sex of instructor.

## TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS . . . . .	iii
LIST OF TABLES . . . . .	xii
LIST OF FIGURES . . . . .	xiii
 Chapter	
I. THE PROBLEM . . . . .	1
Introduction . . . . .	1
Statement of the Problem . . . . .	3
Significance of the Study . . . . .	3
Theoretical Concerns . . . . .	6
Purpose of the Study . . . . .	14
Assumptions, Delimitations, and Limitations . . . . .	15
Definition of Terms . . . . .	16
Organization of the Study . . . . .	18
II. A REVIEW OF RELATED LITERATURE . . . . .	20
Introduction . . . . .	20
The Concept of Interpersonal Distance . . . . .	21
Person-to-Person Spacing . . . . .	23
Person-in-Group Spacing . . . . .	24
Spacing Influenced by the Social or Physical Environment . . . . .	26
Spacing Influenced by Cognition and Perception . . . . .	27
Conceptual Applications to Present Research . . . . .	28
Early Work in Proxemics . . . . .	29
Reactions to Spatial Invasion . . . . .	30
Variables Related to Interpersonal Distance . . . . .	35
Culture . . . . .	35
Angle of Approach . . . . .	37
Physical Characteristics . . . . .	38
Personality . . . . .	38
Personality Abnormalities . . . . .	39
Extroversion-Introversion . . . . .	39
Sociability . . . . .	40
Previous Relationship . . . . .	40
Time of Day . . . . .	42
Race . . . . .	42
Age . . . . .	44
Sex . . . . .	44
Setting . . . . .	46
Topic Under Discussion . . . . .	46
Variables Related to Interpersonal Distance— Synthesis and Application to the Present Research . . . . .	47



	Page
Methodology . . . . .	49
Student-Experimenter Approach and Observation . . .	49
Observation of People in Their Normal Routines . . .	50
Study of Approach Distance Toward Animate or Inanimate Decoys . . . . .	50
Subject Report of Personal Space Invasion . . . . .	52
Observations of Subjects as an Experimenter Approached Them . . . . .	52
Observation of Behavior under Invasion Conditions . . . . .	52
Forced Choice Seating Study . . . . .	53
Forced Violation of an Experimenter's Personal Space . . . . .	53
Subjects' Ratings of Feelings during Spatial Invasion . . . . .	53
A Review of Related Literature--Summary and Relationship to the Present Research . . . . .	57
III. DESIGN OF THE STUDY . . . . .	60
Introduction . . . . .	60
Sample and Sampling Procedures . . . . .	61
Instrumentation . . . . .	61
Pilot Study . . . . .	66
Procedure for Collecting the Data . . . . .	69
Treatment of the Data . . . . .	71
IV. RESULTS AND DISCUSSION . . . . .	75
Introduction . . . . .	75
Discussion of Results . . . . .	80
Mode of Instruction . . . . .	80
Sex . . . . .	83
Race . . . . .	89
Summary of the Findings . . . . .	93
V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS . . . . .	100
Summary . . . . .	100
Summary of Findings . . . . .	102
Conclusions . . . . .	104
Speculations and Implications . . . . .	106
Recommendations for Future Research . . . . .	112
Appendices . . . . .	113
A Comfortable Interpersonal Distance Scale (Original Form) . . . . .	114

	Page
B    Comfortable Interpersonal Distance Scale (Modified Form) . . . . .	115
C    Demographic Questionnaire . . . . .	116
D    Analysis of Demographic Data . . . . .	117
E    Range of Interpersonal Distance Measures (in mm) within Groups . . . . .	121
F    Tukey Tests for Significant Differences . . . . .	122
References . . . . .	131
Vita . . . . .	140

# LIST OF TABLES

Table	Page
1. Interpersonal Distance Means and Standard Deviations Across Categories (in mm) . . . . .	77
2. Analysis of Variance of Interpersonal Distance Measures . . . . .	78
3. Summary of Hypothesized Results and Significant Interactions--Analysis of Variance: Interpersonal Distance Measures . . . . .	79

## LIST OF FIGURES

Figure	Page
1. Mean Distances Maintained from Male Instructors and Female Instructors by Male Students and Female Students . . . . .	85
2. Mean Distances Maintained from Black Instructors and White Instructors by Black Students and White Students . . . . .	91
3. Mean Distances Maintained from Male Instructors and Female Instructors by Black Students and White Students . . . . .	92
4. Mean Distances Maintained from Black Female Instructors, Black Male Instructors, White Female Instructors, and White Male Instructors . . . . .	93

# CHAPTER I

## THE PROBLEM

### Introduction

The teaching-learning process is essentially one of communication. The quality of the communication contributes to the instructional climate. Panos and Astin (1968) found that conditions related to instructional climate were among the major reasons why students left college. In recent years educators have attempted to improve the climate by improving communication. While researchers have given much attention to verbal communication in classroom settings, only recently have they begun considering the impact of nonverbal communication on classroom climate. Nonverbal communication is only one part of the total communication process, but it is an important part. By nonverbal communication is meant the process by which meanings are exchanged between individuals through a common system of nonverbal symbols--body movements, postures, positions, gestures, facial expressions, tone and quality of voice, visual contact, environmental cues, and proxemics.

The intent of the present research was to study variables associated with the dimension of nonverbal communication called proxemics, especially interpersonal distance. This dimension has been studied frequently outside the classroom but has been for the most part ignored as an area of research within the classroom.

As will be shown in Chapter II, researchers have conceptualized spacing between people in numerous ways; however, the investigation

herein is concerned with Duke and Nowicki's (1972) concept of interpersonal distance, as it seems to represent best the dimension under study here.

They conceived of interpersonal distance as

An infinite series of oscillating rings represented in all planes (thus forming a globe). These rings are not necessarily circular but may be ovoid or elliptical. . . . These rings expand and contract, distances increase or decrease, as functions of . . . numerous systematically manipulable, predictable, and measurable factors. (p. 120)

Factors which have been found to relate to the construct proxemics include race, sex, status, and affiliation. Specifically, in the college classroom, these might include race of instructor, race of student, sex of instructor, and sex of student. Additionally, the status and affiliation relationship between the instructor and student is probably related to the organizational pattern or class structure. One class may be structured in such a way that the primary mode of instruction is lecture--the instructor lectures to the class as a whole, with little if any one-to-one instructor-student verbal interaction taking place. Another class, on the other hand may be interactive in that the primary mode of instruction requires the instructor to interact on a one-to-one basis with students. In the first instance, the instructor and individual students probably maintain greater physical distance since the instructor is more likely to remain in the front of the room. Closer physical proximity is usually at the student's initiation, as when he approaches the instructor after class to discuss a class-related problem. In the second kind of class structure,

the instructor usually roams around the room to help students on an individual basis (as in a typewriting class or an engineering laboratory), and the instructor more likely initiates the close physical proximity.

The question which arises then is "Are there variables or combinations of variables which produce the need for different interpersonal distances in instructor-student interactions?" The problem becomes one of obtaining measures of interpersonal distance in various classroom situations.

### Statement of the Problem

The intent of this study was to investigate variables associated with the dimension of nonverbal communication called proxemics and especially interpersonal distance. This dimension has been studied frequently outside the classroom but has been for the most part ignored as an area of research within the classroom. A void in the literature exists in synthesizing and applying the results of proxemic research into practical terms that will enrich teacher-student transfer of knowledge and improve school life itself (Galloway, 1971). Watson (1972) believes that we know very little about the pragmatic aspect of proxemic behavior; the investigation of such systems is, he believes, an important direction in proxemic research.

### Significance of the Study

Two outcomes of proxemic relationships have been identified by proxemic researchers. A growing body of literature suggests that close

physical proximity demonstrates warmth and interest; yet another body of literature suggests that close physical proximity may produce defensive behaviors to protect from further invasion of personal space. Studies have shown that "flight" rather than "fight" is the usual reaction to personal space invasion in man (Felipe & Sommer, 1966; Garfinkel, 1964; Little, 1965; McDowell, 1969).

A paucity of research exists on personal space invasion in an on-going superior-subordinate dyadic relationship such as the instructor-student relationship, and no one has systematically considered boundary variation in the classroom. Yet, such information is greatly needed. Because of the nature of courses taught and teaching methods used, instructors are frequently working individually with students at very close range. For example, the foreign language instructor often needs to demonstrate use of earphones while the student is in the carrel. The positioning here is likely to be the instructor actually standing over the student--almost touching or perhaps even touching. The music instructor may do the same when helping the music student acquire a comfortable position for playing an instrument. The accounting instructor frequently leans over the student and his work, perhaps assisting the student in finding errors. The examples are endless, but the point is that instructors are not always aware of the effect this proximity produces in the student.

If instructors are to maintain an effective instructional climate, they must recognize student spatial boundaries. Hall (1968) has specifically raised this as a problem for proxemic research. Questions he poses which



have implications for the instructor-student relationship are "Is there a special handling of space between superordinates and subordinates?"

"What constitutes a violation of a boundary?" and "Is there a hierarchy of distances between people?" (p. 95)

Certain proxemic relationships have probably developed between instructors and students. First, in a traditional lecture-type class, students most likely expect much lecture from the instructor and probably little if any interaction with him; hence, a safe assumption may be that students expect a certain measure of distance between themselves and their instructors in all classes. Secondly, because of attempts to humanize and individualize education today, class structure is changing (Lambrecht, 1975; Sommer, 1960; Young & Good, 1975). Instructors and students are working closer together physically. Can students put aside previous spatial expectations, if they exist at all, and work comfortably in the new situations? Can a college student, accustomed to the formal lecture class, concentrate on the task at hand when the instructor leans over his shoulder to comment about some of his typewritten work, or when the instructor sits down next to him on the floor during a sensitivity exercise?

The possibility also exists that the teaching-learning situation may be a unique one in that close physical proximity may be tolerated, comparable to the proximity of a doctor or dentist. If this is true, then variables under investigation in this study would produce no different spatial preferences.

A knowledge of spatial needs of students is important to the contemporary instructor. In an attempt to humanize education, educators are varying the spatial environments in the classroom. Yet, educators must be aware that a given environment possesses a varying potential for different students. Since close physical proximity may produce defensive behaviors and defensive behaviors may be disruptive to learning, instructors must be aware of the combination(s) of variables which produce(s) increased interpersonal distance in instructor-student interactions.

### Theoretical Concerns

Like many other aspects of human behavior, a minor controversy exists regarding human spatial behavior, a controversy which centers around the "nature-nurture" issue. Some researchers--for example, ethologists such as Eibl-Eibesfeldt (1970, p. 444)--argue that human beings have certain needs for space which are based on an "innate disposition" and whose fulfillment is necessary for well being. Although man largely creates his own environment, its structure is in line with his biological constitution (Sommer, 1966). As do most vertebrates, man exhibits distinct territorial behavior; that is, individuals maintain distinct interpersonal distances. The specific distances people permit between themselves and others are determined by various cultural patterns. Eibl-Eibesfeldt postulates that "cultural rites are probably often developed upon the basis of

innate learning dispositions" (1970, p. 454). This is where the "nurture" side of the issue arises; the question becomes one of determining cultural rites dealing with space and learning which aspects of human culture nurture the development of individual spatial needs.

The undergraduate college classroom can be considered a micro-culture. What then are the cultural rites students expect to find observed and maintained here regarding interpersonal distance? What is it in the larger culture that nurtured the "innate dispositions" to foster development of spatial expectations here?

Anthropologists, psychologists, and sociologists have identified numerous rites dealing with interpersonal space in general. Some have examined spacing where race is a factor or sex is a factor; others have examined spacing where status is a factor; and still others have investigated spacing in affiliative relationships.

### Race and Distance

The impact of race on distancing is not clear, as research has produced contradictory results. For example, one researcher (Baxter, 1970) found that pairs of Chicanos stood closer together than did whites and that whites stood closer than did blacks. On the other hand, another researcher (Bauer, 1973) found that white males maintained the most distance and white females next; black males maintained middle distance; and black females were most proximal. In general, however, most research seems to point to the conclusion that "people maintain greater distance from persons of a different race" (Duke and Nowicki, 1972, p. 125).

### Sex and Distance

Research findings on the relationship of sex of interactants and distance appear to be nonconclusive. While this relationship has been frequently investigated, results have often been contradictory. Hall (1959, 1966) suggested that different norms may exist for interaction distance for females and males in various cultures. Sommer (1959), Elkin (1964), Garfinkel (1964), Norum (1966), and Little (1968) reported that females tolerate closer physical presence than do males. Horowitz et al. (1964) and Forston (in Knapp, 1972, p. 42), however, found no sex differences.

In general, however, interpersonal distance appears to be influenced by sex. "Male-female pairs require less personal space than female-female pairs who in turn require less than male-male pairs" (Evans and Howard, 1973, p. 337).

### Status and Distance

In the American culture, status appears to be associated with spacing. "Generally those with higher status have more and better space and greater freedom to move about" (Knapp, 1972, p. 43). How this occurs was dramatically illustrated in Theodore White's description of one incident of campaign workers' behavior around John Kennedy. Rushing forward to congratulate him, they suddenly stopped about 30 feet away and maintained that distance. Only those of higher status moved about freely closer to him.

## Affiliation and Distance

Several researchers have considered the relationship between affiliation and distance. Evans and Howard (1973), in reviewing major findings on personal space, concluded that

The preponderance of data suggest that persons who are friendly with each other or wish to communicate a positive affect will tend to interact at smaller interpersonal distances than those who are not friendly (p. 337).

Consideration of variables which have been found to be related to spacing is important in this study. They may be operating variables in the college classroom, where race of student and instructor, sex of student and instructor, and the relationship between the student and the instructor may, alone or together, produce the need for different interpersonal distances in instructor-student interactions.

Consideration of spacing rites between college students and their instructors implies an investigation of a rather complex theory, one that is multifaceted because of the numerous variables which may be operative in the student-instructor relationship.

Considering the undergraduate college classroom as a micro-culture, the classroom can be viewed as a status situation with the instructor being the high-status figure within the microculture. In the American culture, status is associated with greater space or distance. "Generally those of higher status have more and better space and greater freedom to move about" (Knapp, 1972, p. 43). Those of low status tend to respect the boundaries so that a high-status person is kept farther away.

Given information about status and spacing, several questions arise:

1. The first concerns the situation itself. If status can be diminished as a consideration in the situation, will spacing decrease? Status tends to create distance; the interactive class attempts to relax the traditional status structures and relationships of the lecture class; hence, the spacing between students and instructors in interactive classes should be less than in lecture classes.

2. The second question concerns the role of females and males in the American culture. Males have traditionally performed high-status roles and thus have been endowed with higher status than females. People tend to maintain distance from high status figures; thus, a reasonable expectation is that students will maintain greater distance from male instructors than from female instructors. In terms of "less space," then, will students maintain less distance from female instructors than from male instructors? Consideration of other roles of females in the American society reinforces this notion. People are socialized to like females; females are mothers, teachers, and other warm, nurturing roles in most people's early lives. Researchers have found that affiliation influences distance (Evans and Howard, 1973). Since people maintain less distance from those they like, and since most people have been socialized to like females, students should maintain less distance from female instructors than from male instructors.

3. The third question concerns the role of blacks and whites in this culture. Whites, like males, have traditionally performed high status

roles and thus have been endowed with higher status than blacks. People tend to maintain distance from high status figures; thus, a reasonable expectation is that students will maintain greater distance from white instructors than from black instructors. Phrasing the question in terms of "less space" to be consistent with the previous questions then, will students maintain less distance from black instructors than from white instructors?

4. Considering the low-status roles of blacks and females in American culture leads to another question concerning their uses of space. As stated earlier, people of lower status tend to respect the spatial boundaries of higher-status persons by maintaining greater distance. Therefore, a reasonable expectation is that black students and female students will maintain greater distance from instructors than will white students and male students. Conversely, will white students and male students maintain less distance from instructors than will black students and female students?

The four questions posed so far are rather straightforward. Because of the numerous variables operative in the student-instructor relationship, other facets of the use of space in this relationship must be considered. These are questions 5 and 6.

5. The matters of race and affiliation have been touched on in two ways thus far: Whites are traditionally high status and blacks low status; and, affiliation results in proximity. The matters of race and affiliation can now be combined. "Physical attractiveness plays an

influential role in determining responses for a broad range of interpersonal encounters" (Knapp, 1972, p. 64). One theoretical argument is that people like other people who look like them. Extending this to racial characteristics, a logical expectation is that whites should find whites more attractive, and blacks should find blacks more attractive. Since affiliation affects proximity, will students maintain less distance from instructors of the same race than from instructors of a different race; i.e., will white students permit white instructors closer than black instructors and will black students permit black instructors closer than white instructors? Complicating this question is the third question above: Will students maintain less distance from black instructors than from white instructors (assuming that whites have traditionally been accorded higher status, and thus may be accorded more space). The complication may be envisioned in this way:

White students may maintain less space from white instructors because of general attractiveness and affiliation. On the other hand, they may maintain more distance from white instructors because of status.

A further possible complication is an interesting phenomenon observed in recent years:

"There is almost a "boomerang" effect sometimes with the black person still judged only by his skin color, but the judgment is indiscriminately positive instead of negative. Some explain this phenomenon as an over-reaction caused by widespread guilt feelings among whites" (Knapp, 1972, p. 76).



If this phenomenon occurs in the classroom, it would result in white students maintaining less distance from black instructors simply because they are black; and this would complicate the same-race, less-distance expectation.

6. Another aspect of attraction in any relationship is that of sexual attraction. People are generally attracted to those of the opposite sex. Because attraction and affiliation result in proximity, a reasonable expectation is that males will permit females closer and females will permit males closer. Does this hold true in the classroom? Will students maintain less distance from instructors of the opposite sex? Again, a complication arises in answering this question if the second question posed earlier is reconsidered; that is, will students maintain less distance from female instructors than from male instructors (assuming males are viewed as high-status persons whom others permit more space)? The complication for female students is to maintain less distance from male instructors because of sexual attractiveness while maintaining greater distance from male instructors because of their status.

Since the socialization process appears to be a great influence, certain factors in that process seem worthy of investigation:

1. The cultural groups in which one holds memberships have previously been suggested in the forms of race and sex.
2. Since the process of socialization involves time and experience, age may be a factor. The rapidly changing social climate may influence different age groups to accept different interpersonal distances.

3. The primary agent of socialization is the family; certain factors within this unit may bear on development of spatial expectations. These factors are family size, one's age in relation to siblings, and family economic status.

4. Early experiences seem to be most crucial in human development; in fact, distancing norms appear to be determined by the age of twelve years. Because spacing rites appear to vary with cultures and even with subcultures, the culture in which one spends those first twelve years may be an important factor. A person's behavior is expected to be congruent with the culture of which he is a member.

#### Purpose of the Study

The purpose of this study was to investigate variables associated with interpersonal distancing in the college classroom.

The hypotheses studied were the following:

Hypothesis 1. Students will maintain less distance from their instructors in interactive classes than in lecture classes.

Hypothesis 2. Students will maintain less distance from female instructors than from male instructors.

Hypothesis 3. Students will maintain less distance from black instructors than from white instructors.

Hypothesis 4. (a) White students will maintain less distance from instructors than will black students, and (b) male students will maintain less distance from instructors than will female students.

Hypothesis 5. Students will maintain less distance from instructors of the same race than from instructors of a different race: (a) white students will permit white instructors closer than black instructors, and (b) black students will permit black instructors closer than white instructors.

Hypothesis 6. Students will maintain less distance from instructors of the opposite sex: (a) male students will permit female instructors closer than male instructors, and (b) female students will permit male instructors closer than female instructors.

In this study, five demographic issues were also considered: sex of student, race of student, age of student and number and ages of siblings, income level of early family, and domicile during first twelve years. These are presented in Appendix C.

#### Assumptions, Delimitations, and Limitations

In any study of this nature, certain assumptions are made. In this study the assumption was made that interpersonal distance is a continuous variable and that the instructor-student superordinate-subordinate relationship influences student interpersonal distance. Another assumption was that the instrument methodology would be adequate to permit a systematic examination of student-instructor interpersonal distance. The researcher also assumed that students, in responding to the measure of interpersonal distance, would share their true preferences rather than provide measures which they might think others would prefer.

### Delimitations

- 1) The present study included fifty black male students, fifty black female students, fifty white male students, and fifty white female students in randomly selected undergraduate classes at the University of Houston Central Campus during the Spring 1976 semester.
- 2) The interpersonal distance preferences studied were limited to those preferences students provided on the Comfortable Interpersonal Distance scale (Duke & Nowicki, 1972) rather than a real-life measure.
- 3) Only the variables of race, sex, and mode of instruction were considered; the study did not include other variables such as teaching ability or style, warmth, physical appearance, age, or any other characteristics of the instructor.
- 4) The subjects were not selected on the basis of age, cultural background, personality, or any other variable.
- 5) Only black and white races were considered.

### Limitations

- 1) A limitation of the study was the dependence of the investigator on data provided by the subjects.
- 2) Another limitation was the artificiality of the classroom situations presented to the subjects as stimuli.

### Definition of Terms

Communication--Process by which meanings are transferred from one person to another through gesture, posture, facial expression, tone and quality of voice, as well as by speech.

Interactive class--Class in which the predominant mode of instruction requires students to interact either on a one-to-one basis with the instructor or another student or in such a way that all students in the class are equally free to verbalize among themselves or with the instructor. An example is the typewriting or mathematics class where students work individually and at their own pace, or a management class which is experientially based and includes management games, simulations, or small-group activities.

Interpersonal distance--

"An infinite series of oscillating rings represented in all planes (thus forming a globe). These rings are not necessarily circular but may be ovoid or elliptical. . . These expand and contract, distances increase or decrease, as functions of . . . numerous systematically manipulable, predictable, and measurable factors." (Duke & Nowicki, 1972, p. 120)

Lecture class--Class in which the instructor lecture or instructor discourse is the predominant mode of teaching; any interaction between one student and the instructor or one student and another is usually done with the remaining class members aurally participating. An example is the English instructor lecturing in front of the room to the class about American authors.

Nonverbal communication--Process by which meanings are exchanged between individuals through a common system of nonverbal symbols; that is, body movements, postures, positions, gestures, facial expressions, tone and quality of voice, visual contact, environmental cues, and proxemics.

Proxemics--Study of man's perception and use of space in his daily activities and interactions with others.

Nonverbal communication--Process by which meanings are exchanged between individuals through a common system of nonverbal symbols; that is, body movements, postures, positions, gestures, facial expressions, tone and quality of voice, visual contact, environmental cues, and proxemics.

Proxemics--Study of man's perception and use of space in his daily activities and interactions with others.

Real-life measures--

"Those methods which attempt to measure interpersonal distance or personal space by experimentally arranging actual human interactions or by unobtrusively observing naturally occurring interpersonal positioning" (Duke & Nowicki, 1972, p. 121).

### Organization of the Study

This study was an attempt to determine whether college students prefer different interpersonal distances when interacting with instructors, considering the variables of mode of instruction, sex of self and instructor, and race of self and instructor.

Chapter II of this study presents a selected review of the literature on the concept of interpersonal distance (or personal space). Additionally, this chapter presents a review of the pertinent literature on reactions to personal space invasion and the variables related to boundary size. Also presented are literature citations to support use of the Comfortable Interpersonal Distance scale along with relevant reliability and construct validity information. The Duke-Nowicki theory is presented as a way of linking separate proxemic findings.

Chapter III explains the procedures employed in the study and discusses a two-phased pilot study that was performed.

Chapter IV contains a presentation and analysis of the data collected in the study.

Chapter V includes the summary, conclusions, implications that are relevant to this study, and recommendations for further research.

## CHAPTER II

### A REVIEW OF RELATED LITERATURE

#### Introduction

The intent of this study was to investigate variables associated with the dimension of nonverbal communication called proxemics and, especially, interpersonal distancing in the college classroom.

This chapter is divided into five major sections. The first section is an exposition of the concept of interpersonal distance. It presents various definitions and theories of the concept. The theories are grouped into four categories: (1) person-to-person spacing, (2) person-in-group spacing, (3) spacing influenced by the social or physical environment, and (4) spacing influenced by cognition and perception.

The second section of the review discusses early work in proxemics, beginning with its roots in individual distance in animals.

The third section is devoted to reactions to spatial invasion reported in the literature.

The fourth section is a discussion of research on variables related to boundary size. These include culture, angle of approach, physical characteristics, personality, previous relationship, time of day, race, age, sex, setting, and topic of discussion.

The final section of the review of the literature is a report of methods employed in research in interpersonal distance. These methods have often been poor techniques which may account for much of the inconsistency and ambiguity.



### The Concept of Interpersonal Distance

To understand the concept being investigated in this study requires an understanding of the theories underlying it. The terms "proxemics," "personal space," "bubble," "territoriality," "body buffer zone," and "interpersonal distance" are used interchangeably. Numerous definitions for the concept of human distancing have been offered by researchers.

Proxemics, according to Hall (1963), is

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

Hall (1964) further defined it as

the study of ways in which man gains knowledge of the content of other men's minds through judgments of behavior patterns associated with varying degrees of proximity to them. These behavior patterns are learned, and thus they are not genetically determined. But because they are learned (and taught) largely outside awareness, they are often treated as though they were innate (p. 41).

Dorsey and Meisels (1969) define personal space as "the space immediately surrounding an individual which he feels to be personal, to belong to himself" (p. 93). Personal space is a part of the concept of territoriality, but it differs from territory in that it has "no fixed geographic reference points, moves about with the individual, and expands and contracts under varying conditions" (Sommer, 1959, p. 247).

Sommer (1969) further defines personal space as the area surrounding a person's body into which intruders may not come. Wynn-Edwards (1962) writes that personal space implies the "preemption of a

minimum amount of space surrounding the individual, into which other individuals cannot intrude without rendering themselves liable to attack" (p. 133).

The study of personal space in man was begun by Hall in 1955. He pointed out that cultures differ in their use of space, that various sensory cues are used to judge distance, and that personal space is a form of nonverbal communication. He coined the term "proxemics," developed a system of notation for the study of personal space, and identified and named distance zones in man. He viewed these zones as a series of concentric circles surrounding a person; the specific circle in which an interaction occurs is determined by the degree of intimacy and the particular function of the relationship. Sommer (1966), however, after much investigation of personal space, concluded that it consists of non-concentric fluctuating globes.

Duke and Nowicki (1972) conceive of interpersonal distance as

. . . an infinite series of oscillating rings represented in all planes (thus forming a globe). These rings are not necessarily circular but may be ovoid or elliptical. To this extent, the previous models are adequate, but it is obvious that these rings expand and contract, distances increase or decrease, as functions of what the authors consider numerous systematically manipulable, predictable, and measurable factors (p. 120).

While the broad topic of interpersonal distance has received much attention from proxemic researchers, theoretical discussion has been rather scarce. Evans and Howard (1973), in reviewing theoretical aspects of personal space, grouped specific theories into four categories (1) basic

individual encounters, (2) social interactions among groups of people, (3) demand characteristics of the social or physical environment, and (4) cognitive and perceptual aspects. Because their breakdown appears to cover most completely all aspects of the concept, it is used here with some modification and elaboration.

### Person-to-Person Spacing

Person-to-person spacing (or basic individual encounters) includes the direct face-to-face interactions that a single organism (as distinguished from a group) has with other single organisms.

One of the earliest attempts to formulate a theoretical base pertaining to interpersonal distance was made by Hall (1966), who suggested that space in humans is much the same as individual distance in animals. He described a proxemic classification system with the hypothesis that it is in the nature of animals, including man, to exhibit territoriality. In so doing, they use their senses to distinguish between one space or distance and another. The specific distance chosen depends on the transaction, the relationship of the interacting individuals, how they feel, and what they are doing.

Horowitz (1968) and Horowitz et al. (1970) proposed the idea that personal space is a "body buffer zone" which protects people from personal threats to their emotional health. They investigated individual distance among schizophrenic and nonschizophrenic mental patients. Each subject was instructed to walk over to either another person or a hatrack, and the

distance between his goal and his stopping place was measured. Both groups approached the hatrack closer than they approached a person, and each subject tended to have a characteristic individual distance that was shorter for inanimate objects than for people. They concluded that the size, shape, and penetrability of buffer zone probably depend on immediate interpersonal events, current ego and drive states, and the individual's psychologic and cultural history.

Sommer (1969) wrote that people distribute themselves to maintain space for themselves and distance from others. He discussed the way knowledge of human territoriality and spatial needs could be applied to architecture and urban design so as to maximize psychological comfort and social usage. In looking at classrooms from the point of view of proxemics, he pointed out that the usual spatial layout of straight rows of chairs oriented toward the teacher suggests on a nonverbal level the authority-oriented flow of communication from teacher to student. Sommer suggested that students be given spatial freedom to change seats at will and that the interaction pattern be kept in a more fluid state, permitting individual differences to emerge in the free-choice of seats and participation in class discussion.

#### Person-in-Group Spacing

At least two researchers have considered spacing from the viewpoint of social interactions in groups. Patterson (1968), in reviewing studies of human distancing, concluded that space is important in social interactions.

He suggested that spatial cues serve a dual function: to communicate and to facilitate or hinder interaction. These factors, however, are usually difficult to isolate: for example, an executive's large desk performs both functions; it communicates to others the executive's importance, and it limits their interactions with him. Patterson further suggested that attitudes and interaction distance may have a reciprocal relationship; for example, alphabetical seating in elementary schools probably produces a significant number of friendships between children whose last names begin with the same letter. In the same way, prejudice might be reduced by increasing contact between the races.

Patterson predicts a reciprocal relationship between attitudes and distance on the basis of commitment and dissonance theory. He also suggested that an individual's preferences for interaction distance may be a function of his previous experiences; frequent exposure to intimate approaches might produce adaptation to such situations and change a person's conception of a comfortable interaction distance. Out of this theory, Patterson predicted that interpersonal distances which are moderately discrepant from the adaptation level are experienced as more pleasurable than those at the adaptation level or very discrepant from it.

Pederson and Shears (1973), in reviewing personal space research, related it to social interactions. They used general system theory as a framework because of its role in communicating information. The information communicated is feelings and attitudes, which are conveyed by the person's use of his body and the space occupied by it and his possessions.

They proposed that personal space serves to maintain the equilibrium of personal systems and group systems. The personal system has an environment made up of other people and things. The group system is the interacting group with its surroundings of things, people, and space.

In the person system, the individual responds emotionally and physiologically vis-a-vis another person, thing, or place. In the system approach, the person's objective in sensing cues and heeding to them is to generate information needed to maintain a steady state in the system which is his body. In the group system, the movements of individuals and the patterns of their interaction yield information which is used to maintain a steady state of social relationships within the group system. (Pederson & Shears, 1973, p. 367)

#### Spacing Influenced by the Social or Physical Environment

Some researchers have considered spacing to be a useful or necessary rite called into play in a peculiar or distinctive way as a reaction to the interaction of the individual and the group or the interaction of the individual with his physical surroundings.

Leibman (1970) conceptualized personal space as a "psychological variable which intervenes between antecedent conditions and consequent interpersonal behavior" (p. 210). Dabbs (1971) also believes that it is related to the demand characteristics of the social or physical environment; he concluded that a person's response to a crowded condition is affected by the congruency of altercation and close proximity.

Duke and Nowicki's model, described earlier, falls in this category. They integrated interpersonal distance behavior into a social learning

model and experimented with locus of control. They found that the only spatial difference between externals (these who believe they are controlled by fate) and internals (those who believe they are controlled by their own will) occurred when interacting with strangers. They attributed this difference to the idea that heightened uncertainty of interacting with strangers causes an external person to prefer greater distances because he feels that he cannot control the situation as the internal individual does.

### Spacing Influenced by Cognition and Perception

Several researchers have discussed cognitive and perceptual aspects of spacing. By this is meant the manipulation of space through the processes of knowing, through both awareness and judgment, and/or sensory stimulation (physical sensation interpreted in the light of experience). Argyle and Dean (1965) and Hall (1966) proposed that an optimal level of interaction exists between individuals. Argyle and Dean suggested that distance is based on the balance of approach and avoidance forces. In 1968 Argyle et al. suggested that eye contact and interpersonal distance interact to form an "affiliative balance." This balance or equilibrium is maintained through compensatory changes in eye contact and interpersonal distance which vary inversely. Lassen (1969) and Albert and Dabbs (1970) reported findings that substantiated Argyle and Dean (1965) and Hall (1966); they found maximum selective attention and comfort at middle interpersonal distances.

In 1970 Baxter, in studying personal space behavior among subcultures, found different behaviors; his reasoning was that such differences may be the result of subcultures relying on various information channels.

### Conceptual Applications to Present Research

The studies discussed in this section all bear directly on the present investigation. The various definitions given are not in conflict, and the various theories have much in common, describing different aspects of the same phenomenon. As such, they lend support for an examination of spacing in a situation where the individual must interact with another in a group setting (the student-instructor relationship in the classroom), where the unique social and physical environment may produce distinctive spacing rites, and where both cognition and perception come into play.

### Early Work in Proxemics

Most of the early work on personal space involved subhumans (Allen, 1939; Conder, 1949; Hediger, 1950, 1955, 1961). Hediger studied distances among various species and distinguished flight distance, social distance, and individual distance. Flight distance is the point at which an animal flees its predator; social distance is the average distance maintained between animals of the same species; and individual distance is the particular individual boundary beyond which even members of the same species may not come without being attacked.

The term "territoriality" originated in the study of animal and fowl behavior. It refers to

. . . behavior characterized by identification with an area in such a way as to indicate ownership and defense of this territory against those who may 'invade' it. There are many different kinds of territorial behavior, and frequently these behaviors perform useful functions for a given species. For instance, territorial behaviors may help coordinate



activities, regulate density, insure propagation of the species, provide places to hide, hold the group together, provide staging areas for courtship, for resting, or for feeding.

Most behavioral scientists agree that territoriality exists in human beings, too, and that it is frequently an extremely important variable in a particular interpersonal transaction. However, many would not agree with Ardrey (1966) who feels that it is a genetically inherited trait somehow related to man's innate aggressiveness. (Knapp, 1972, p. 37)

One reason for man's interest in territorial violation is the concern of human overpopulation. In studying animal behavior in crowded conditions, Christian and Davis (1964) found that overpopulation caused death in deer. But the death was not by starvation, infection, or aggression but rather by a physiological reaction to the stress created; the adrenal glands which help regulate growth, reproduction, and the level of the body's defenses became overactive. Calhoun(1962) studied three generations of rats in an overpopulated situation and noted gross distortions of behavior such as social withdrawal, sexual organ disorders, and eating of newborns by males.

Generalizing from animals to humans is risky at the very least. In fact, Freedman (1971), after study of human behavior in a crowded room, suggested that density itself may not be what causes negative reactions but the number of persons who are forced to interact with each other. Knapp (1972, p. 41) suggested that the next logical step in spatial research is the specification of how these two factors interact.

The work of proxemic researchers has direct implications for educators. Today's educational institutions are a part of a highly populated

society; representing that society, the schools and universities themselves are often crowded. What might be the effect on human behavior and learning in crowded conditions remains to be seen; certainly, the problem is one which merits further attention by proxemic researchers and educators.

### Reactions to Spatial Invasion

Various researchers have established that people have personal space boundaries and that spatial invasions have a disruptive effect. Two reactions to spatial invasion are fight and flight. Studies have shown that flight rather than fight is the usual reaction in humans.

Two major principles of the concept of personal space are (1) that a limit exists on the proximity in which comfortable public interactions are possible and (2) that violation of spatial norms leads to the discomfort of the interactants (Barefoot, Hoople, & McClay, 1972). Several studies have shown that close personal proximity can be aversive in that people will try to protect themselves from invasion. (Garfinkel, 1964; Felipe & Sommer 1966; Hall, 1966; McDowell, 1969; Sommer, 1969)

When violation is made of a friend or acquaintance's personal space, the results of an informal experiment by Garfinkel (1964) indicate that sexual intent may be considered by the victim to be the motivating force behind the violator's behavior. Therefore, flight may occur because the victim sees the violator's act as indicative of uninvited sexual advances. Garfinkel suggests that regardless of whether the interacting pairs are the same or different sexes, or whether they are friends or acquaintances, subjects attribute sexual intent on the part of the violator, "though

confirmation of this intent was withheld" in this particular study (p. 347). In Garfinkel's study, student experimenters attempted to violate "individual distance" by getting nose to nose with friends or acquaintances during a conversation. The close proximity produced avoidance, bewilderment, and embarrassment on the part of the subjects; and these effects were more pronounced among males. Garfinkel's belief is that previous acquaintanceship with the violator may produce systematic interpretations of the violator's behavior which are not generalizable to interacting strangers.

Argyle and Dean (1965) reported on a program of visual research, concentrating on the affiliative function. They suggest that eye contact and distance balance each other out, so that approach and avoidance tendencies are equalized at the level of eye contact and distance chosen as "comfortable" by interactants. They invited subjects to participate in a perceptual experiment in which they were to "stand as close as comfortable to see well" to a book, a plaster head, and a cutout life-sized photograph of Argyle with his eyes closed and another with his eyes open. The subjects placed themselves closer to the eyes-closed photograph than the eyes-open photograph. In studying the connection between eye contact, distance, and affiliation, the authors used a one-way mirror to chart interaction between a naive subject and a confederate who gazed continually at the subject. Eye contact was less and glances were shorter when the people were close together, and this effect was most pronounced for mixed-sex pairs. The authors believe that eye contact is a component of intimacy

which is governed by both approach and avoidance forces kept in a state of equilibrium during any given encounter. When this equilibrium is disturbed by increasing physical proximity or decreasing eye contact, compensatory changes appear in the other dimension.

McBride et al. (1965) found galvanic skin response (GSR) to vary under different conditions of spatial invasion. They tested GSR to varying amounts of closeness between a subject and a male or female experimenter, theorizing that GSR effects would provide an indication of the level of arousal associated with the proximity of others. They found that GSR was greatest (skin resistance was least) when the subject was approached frontally, while a side approach yielded a greater response than a rear approach. The response to experimenters of the same sex was less than to experimenters of the opposite sex. Being touched by an object produced less of a GSR than being touched by a person.

Felipe and Sommer (1966) reported on systematically staged invasion sequences they conducted under natural conditions (people seated on benches and at library tables). Confederates sat down quite close to strangers without interacting with them. Felipe and Sommer wrote:

Spatial invasions have a disruptive effect and can produce reactions ranging from flight at one extreme to agonistic display at the other. The individual differences in reacting to the invasion are evident; there was no single reaction.

. . . The victim can attempt to accommodate himself to the invasion in numerous ways, including a shift in position, interposing a barrier between himself and the invader, or moving farther away. If these are precluded by the situation or fail because the invader shifts positions, too, the victim may eventually take to flight. (p. 212)

In fact, within five minutes after the confederate had sat down as close as possible to the subject without actually touching him, 70 percent of the subjects had moved to another location. Interestingly, verbal responses to invasions are rare. Sommer (1969) reported that only one of eighty subjects asked the invader to move over.

Hall (1966) suggested that the typical response to space surrounding an individual is the maintenance of a "freezing" posture and avoidance of touching the other person until the environmental restrictions are dropped.

McDowell (1969) demonstrated that violations of personal space by a stranger elicit a significant movement away from the violator but no distinctly different evaluations of the violator's personality. The movement away from the violator supports the findings of Felipe and Sommer (1966) and in addition demonstrates that this response occurs even while the participants are interacting. However, McDowell found that no significant difference occurred in the number of instances of established eye contact as a result of distance, no increase in face-to-face confrontation, and no significant difference in turning away from the invader or change in body orientation.

Koch (1971) writes that one signal of people who do not want to be touched is that they will retreat if another draws too close. He adds that "we grow uneasy if another steps into our bubble" (p. 232).

Barefoot et al. (1972) found that people will avoid an act which would violate the personal space of another. In their study, male passerbys were less likely to drink from a water fountain in a public building when a

confederate was near (one foot) the fountain than when the confederate was seated at less proxemic positions (5 and 10 feet).

Cheyne and Efran (1972) and Baum, Riess, and O'Hara (1974) also found that people tend to avoid an act which would invade the personal space of others.

Mahoney (1974) found that spatial immediacy produced flight reactions and cross-glancing, leaning or blocking, and that subjects decrease, rather than increase, motor reactions.

In summary, then, people do demonstrate the existence of personal space boundaries and do react when this space is threatened by invasion. The reactions seem to involve some degree of discomfort. To alleviate this discomfort, humans will remove themselves from the invader or will attempt to decrease the degree of invasion by avoiding eye contact, shifting position, and/or "freezing," or placing a barrier between themselves and the invader. Additionally, human beings apparently respect others' personal space boundaries and will avoid acts which would violate these boundaries.

Relating these findings to the present investigation, the researcher would expect students to recognize their own personal space boundaries and to avoid proxemic relationships with instructors when spatial invasion is a threat; that is, that students would want instructors to stay far enough away from them so that they (the students) could continue to feel comfortable.

### Variables Related to Interpersonal Distance

Over the past twenty years a sizable amount of research has been conducted in an attempt to discover the variables which are related to interpersonal distance. Variables discussed in the literature include culture, angle of approach, physical characteristics, personality, previous relationship, time of day, race, age, sex, setting, and topic under discussion.

#### Culture

Much of the early research on personal space was done by the anthropologist E. T. Hall, who became interested in how people from different cultures use space. Hall (1968) wrote that no fixed distance-sensing mechanism exists that is universal for all cultures. Hall (1966) presented four distance zones "compiled from observations and interviews with noncontact, middle-class healthy adults, mostly natives of the northeastern seaboard of the United States" (p. 109): intimate (0-18"), personal (18-48"), social (48-144"), and public (over 144"). Boundary points between distance sets are sensorially determined. Hall believed that how people code distance is a function of the combination of receptors they use. These do not always seem to be the same from culture to culture and vary even within subcultures. Visual and kinesthetic cues are prominent in noncontact Americans. Olfactory and tactile cues are emphasized in the Eastern Mediterranean urban Arab culture (Hall, 1964). Hall reported that Germans, for example, seem to have a larger personal space and to be less flexible in their spatial behavior than

Americans. Some other nationalities, however, differ in that they have smaller personal space; these include Arabs, Latin Americans, and French people.

Watson and Graves (1966) reported consistent findings when comparing Arabs and Americans; Arabs confronted each other more directly, moved closer together, were more likely to touch, maintained more eye contact, and talked louder.

Sommer (1968) studied spatial behavior in English, Americans, Swedish, Dutch, and Pakistanis. Only the Dutch and Pakistanis differed, with Pakistanis having slightly smaller personal space and the Dutch slightly larger.

Little (1968) also looked at cultural variations in spacing. He found that people from the Mediterranean cultures (Greece, Southern Italy) interacted at closer distances than those from North American and Northern Europe (United States, Sweden, and Switzerland).

In an extensive study of culture and spacing, Watson (1970) classified cultures as "contact" or "noncontact." By contact is meant people who face each other more directly, interact more closely, touch each other more, look one another in the eye more, and speak more loudly. Contact groups in Watson's study were Southern Europeans, Arabs, and Latin Americans. Noncontact groups were Asians, Indians and Pakistanis, Americans, and Northern Europeans. On the other hand, Forston and Larson (1968) found Latin American students sit farther apart than North Americans; and Jones (1971) found no difference in various ethnic and subcultural groups in the United States.



The work of Hall and others was summarized by Evans and Howard (1973):

Cross-cultural data suggest that individuals from North America and Northern Europe have larger zones of personal space than those from the Mediterranean (p. 337).

### Angle of Approach

Sommer (1959) found that females make more use of the side-by-side arrangement in small discussion groups than do males, and he suggested that females can tolerate closer physical presence than can males. Hare and Bales (1963) found that women preferred sitting with others in a corner-to-corner position at a table or beside another person, whereas males preferred other seating arrangements, especially opposite positions. McBride et al. (1965), in testing galvanic skin response (GSR) to varying amounts of closeness between subject and male or female experimenters, considered that GSR effects would provide an indication of the level of arousal associated with the proximity of neighbors. They found that GSR was greatest (skin resistance was least) when the subject was approached frontally, while a side approach yielded a greater response than a rear approach. Lewit and Joy (1967) reported that people facing one another or in typical bodily orientations maintained closer interpersonal distances than those facing away or in unusual body positions.

However, Rawls et al. (1968), when comparing personal space measures, found no significant differences between distances when another person walked up to the back, front, left, and right sides of a stationary

person. Yet, Pederson and Heaston (1972) found that females permitted closer approach at the sides than at the front and that males differed from females in that they permitted others to approach closer frontally.

### Physical Characteristics

Kleck (1969) conducted a study in which a left leg amputation was simulated through the use of a specially constructed wheel chair. Consistent with expectations, when subjects interacted with a disabled confederate they employed a greater interaction distance; however, this behavioral tendency decreased as interaction time increased. People perceived as epileptics elicited similar reactions.

Knapp (1972) wrote that "physical attractiveness plays an influential role in determining responses for a broad range of interpersonal encounters" (p. 64). He reached this decision after reviewing research on physical appearance. The research showed that physical attractiveness was used by females as a manipulative device to obtain higher grades from college professors. Other research showed that an attractive female could modify attitudes of male students more than an unattractive girl could, and that physical attractiveness seems to be an extremely important factor in courtship and marriage decisions.

### Personality

Several researchers have considered personality variables as determiners of interpersonal distance. Specific aspects of personality examined have been personality abnormalities, extroversion-introversion, sociability, and locus of control.

Personality Abnormalities. -- Sommer (1959) observed that schizophrenics in his study consistently sat closer to a decoy than would normal subjects. Horowitz et al. (1964) investigated individual distance among schizophrenic and nonschizophrenic mental patients. Each subject was instructed to walk to either another person or a hatrack, and the distance between his goal and his stopping place was measured. Both groups approached the hatrack closer than they approached a person. The area of the body buffer zone was greater in the schizophrenic group. Such studies suggest that people with personality abnormalities need more personal space. Felipe and Sommer (1966) reported that schizophrenics flee when their personal space is invaded. Wolowitz (1965), Luft (1966), Horowitz (1968), Horowitz, Duff, and Stratton (1970), and Booraem and Flowers (1972) found that adults with personality abnormalities need more space than normal adults. Weinstein (1965, 1967), Hobbs (1966), Fisher (1967), and Tolor (1968) found this in children as well.

Inconsistent findings about space and personality have been reported by other researchers, however. Blumenthal and Meltzoff (1967), Dorsey and Meisels (1969), and Meisels and Canter (1970) found no relationship between personal space and mental health.

Extroversion-Introversion. -- Leipold (1963) noted the chair a person occupied in relation to a seated decoy under anxiety and praise conditions. Anxiety conditions resulted in greater distance, and extroverts placed themselves closer to the decoy than introverts. Williams (1963) also found that introverts placed themselves farther from

other people than did extroverts, as did Patterson and Holmes (1966) and Patterson and Sechrest (1970).

However, again inconsistent findings have been reported. Meisels and Canter (1970) and Porter, Argyle, and Salter (1970) found no relationship between personal space and extroversion-introversion.

Sociability. -- Rodgers (1972) found that low sociability subjects as measured by the Heron Two-Part Personality Inventory, demonstrated a significantly greater variability in the amount of space preferred than did high sociability subjects in four of six trials; and he found no relationship between the degrees of sociability and preferences for personal space. Eberts (1972), however, found that persons who lived alone, saw their friends as conservatives, and had lower self-acceptance scores preferred more personal space.

Kleck (1969) considered the impact of another person's personality on a subject's distance. He told the subject that the other person was "warm and friendly" or "unfriendly." The greatest distance was from the "unfriendly" person. When subjects were told to behave in a "friendly" way with another person, they maintained less distance than when they were told to "let him know you aren't friendly."

#### Previous Relationship

The relationship of interactants may affect their spacing. Little (1965) reported that the extent of one's personal space is less when interacting with friends. In his study he asked college students to place

plexiglas cutouts and live actresses in special schema for social interaction. He found that judgments of appropriate interaction distances in a dyad were markedly influenced by the given degree of acquaintance of the two members of the dyad. Perceived interaction distance was approximately 34 inches for strangers, 27 inches for acquaintances, and 18 inches for friends. His results indicated that people perceived interaction distances between others to be greater when the degree of acquaintanceship or friendliness was less. However, Meisels and Dorsey (1971) found that under certain conditions angry people assume small interpersonal distances.

Little (1968), in a cross-cultural study, again found interaction closest between friends, middle distance between acquaintances, and farthest apart for strangers.

Willis (1966), in studying initial speaking distance as a function of the speaker's relationship, found that student experimenters were approached more closely by their friends than by their parents whose approach was similar to that of strangers. The range of distances in Willis's study was 17.75 inches for close friends speaking to women to 28 inches between whites and blacks.

Several researchers have pointed out that people who are friendly with each other maintain less interpersonal distance than do strangers or nonfriends (Aiello & Cooper, 1972; Gottheil, Corey, & Parades, 1968; Guardo & Meisels, 1971; Kuethe, 1962; and Seguin, 1967).

Others have noted that smaller interpersonal distances are used to convey a friendly impression or a positive attitude (Golding, 1967;

King, 1966; Little, Uletha, & Henderson, 1968; Lott & Sommer, 1967; Mehrabian, 1968, 1969; Patterson & Sechrest, 1970; Rosenfeld, 1965; and Sommer, 1967).

Knapp (1972) notes that in this culture status is associated with greater space. He tells of an incident in Theodore White's Making of the President 1960 when John Kennedy's campaign workers maintained about 30 feet away from him as a reaction to his new status. Burns (1964) and Mehrabian (1969) both reported that distance between two communicators seems to be positively correlated with their status discrepancy.

Still others, however, have found no significant relationship between interpersonal distance and impressions (Porter, et al., 1970; Lassen, 1969).

In 1973 Evans and Howard concluded that

the preponderance of data suggest that persons who are friendly with each other or wish to communicate a positive affect will tend to interact at smaller interpersonal distances than those who are not friendly (p. 337).

### Time of Day

Rodgers (1972) found that the amount of personal space preferred in the morning (8:30-9:30 AM) was significantly greater than the amount preferred in the afternoon (2:30-3:30 PM) for all 100 subjects.

### Race

The subcultural variable of race has been considered by several researchers. Campbell, Kruskal, and Wallace (1966), Tolor (1968), and

Duke and Nowicki (1972) found that people maintain greater distance from persons of a different race. Baxter (1970) found that pairs of Chicanos stand closer together than whites who in turn stand closer than blacks. Aiello and Jones (1971), in a study of white children, black children, and Puerto Ricans, found white pairs to maintain the greatest distance. Bauer (1973), in a study of black and white college students, found that white males chose the most distant positions from a confederate of their own sex and race whom they did not know; white females were next; black males followed; and black females were most proximal.

Other researchers, however, have not found race to be a factor in spacing. Forston and Larson (1968) found no significant difference between Latin Americans and North Americans; and Jones (1971) has not found subcultural differences within the United States.

Regarding spacing in mixed-race pairs, Willis (1966) found them to maintain greater space than same-race pairs. Willis also reported that whites stood closer to each other when speaking than did blacks. Leibman (1970) found that while race of confederates did not influence white subjects, black females preferred intrusion by black males rather than white males.

Duke and Nowicki (1972) showed the following proposition to be promising: "People maintain greater distance from persons of a different race" (p. 125). On the other hand, Forston (in Knapp, 1972, p. 42) found no race differences in conversational distance for seated triads. No significant differences were found in distances chosen by groups composed of all one race as compared to groups made up of blacks and whites.

## Age

Several researchers have reported findings which lead to the conclusion that age is an important variable in distancing. Guardo (1969) and Meisels and Guardo (1969) found a developmental difference in preferred distance from the opposite sex for both sexes of subjects. Willis (1966) found that peers stood closer than did persons older than the listener. Duke and Nowicki (1972) reported consistent results; they found a decrease in distancing of the opposite sex with the coming of adolescence. Evans and Howard (1973) reported that

The small amount of research on developmental aspects of personal space suggests that children develop spatial norms which have a regular sequence, with the onset of normal personal-space behavior at about age 12. (p. 337)

## Sex

As brought out incidentally in several of the previously reported studies, sex of interactants influences the interpersonal distance preferred.

Hall (1959, 1966) suggested that different norms may exist for interaction distance for females and males in various cultures. Several researchers following him--Sommer (1959), Elkin (1964), Garfinkel (1964), Norum (1966)--found that females can tolerate closer physical presence than can males. Little (1968) had subjects place dolls of the same sex as the subject at interaction distances elicited by 19 different social schemata involving consultative transactions (e.g., discussion of business affairs) as opposed to intimate ones (e.g., discussions of intimate affairs). The latter were seen by the subjects as taking place at closer distances than the former, with females using significantly closer distance than males.



McBride et al. (1965) found that galvanic skin response to experimenters of the same sex was less than to experimenters of the opposite sex.

Pederson and Heaston (1972) found that both males and females positioned females closer than males. They found no difference in the distance that males and females positioned males.

Horowitz et al. (1964) found no significant difference between approaches to male or female in two groups of schizophrenic and non-schizophrenic mental patients. However, the next year Horowitz (1965) found that when male subjects used personal comfort as a criterion for interpersonal distance, they placed a greater distance between themselves and a male than between themselves and a female.

Willis (1966) found that speakers stood closer to women than to men. Forston (in Knapp, 1972, p. 42), however, found no sex differences in conversational distance for seated triads.

Long et al. (1968) reported that female adolescents chose positions that maintained less interpersonal distance from others than did males; during early and mid-adolescence, females first withdrew and later reapproached others.

Dorsey and Meisels (1969) found that males approached members of either sex at about the same distance while females approached females closer than did males.

Evans and Howard (1973), in summarizing major findings in personal space research, concluded that

Personal space is influenced by sex. Male-female pairs require less personal space than female-female pairs who in turn require less than male-male pairs. (p. 337)

### Setting

Social setting appears to influence how much distance people maintain. In one study relating to setting, Little (1965) had his subjects assume that they were directors and instructed them to arrange actresses at distances they considered appropriate in various settings: a street corner, an office waiting room, the lobby of a public building, and a campus location. The closest positioning was in the street scene and the greatest distance was in the office.

### Topic under Discussion

Leipold (1963) found that students sat farther from the experimenter when they anticipated a stressful conversation than when they anticipated praise. In his study he had subjects enter a room and be given one of three comments: stress ("Your grade is poor and you have not done your best"), praise ("You are doing very well and Mr. Leipold wants to talk with you further"), or neutral ("Mr. Leipold is interested in your feelings about the introductory course").

Leipold (1968) found that the close physical distance was related to pleasant topics, but neutral and unpleasant topics did not produce significantly different distances. In his study he had subjects in several different countries position dolls relative to other dolls for a variety of social situations and for pleasant, neutral, and unpleasant topics.

### Variables Related to Interpersonal Distance--Synthesis and Application to the Present Research

Numerous variables appear to influence how one uses space. Applying the above findings to the present research, one can expect that the cultural background of American college students places them in the noncontact category; hence, they will act to maintain space between themselves and their instructors. Regarding angle of approach, research findings have been inconsistent; for this reason, one would have difficulty in predicting a student's reaction to an instructor's approaching him/her from various angles. Unless angle of approach were to be considered a variable in itself then, a study of spacing in the classroom should hold angle of approach consistent. Because physical characteristics appear to influence social desirability and people generally find those of the same race to be attractive, the distance maintained between students and instructors should be influenced by their race(s).

Personality has been found to be related to spacing by some researchers. Because knowledge of students' personality is usually not available to instructors prior to interaction, this variable does not appear to be a promising one for classroom research at this point.

Previous relationship has been found to influence spacing between people, with greater familiarity and liking producing the least distance, while strangers, different races, and high status individuals produce the greatest distance. Several implications for an instructor-student relationship may be drawn from this. Students probably would maintain the greatest distance from the instructor(s) they endow with the greatest status, or from

instructors of another race, or from instructors with whom they feel least familiar.

Time of day was found by one researcher to influence the amount of distance preferred. However, because this finding was incidental to the one study, it would appear to need more research as a separate variable and does not at this point warrant inclusion as a variable in the present study.

Contradictory findings have been reported about race by numerous researchers--some finding it to influence distance and some finding it not to be a factor in distancing. People have been found to maintain greater distance from persons of a different race. Chicanos have been found to stand closer together than whites who stand closer than blacks. White males have been found to choose the greatest distance from each other, and black females the least distance. Additionally, some researchers have found people to maintain greatest distance from persons of a different race. Race, therefore, appears to be a likely variable for investigation in the college classroom.

Little attention has been paid in research to the impact of age on space. What exists seems to indicate that spatial norms are developed, probably around the age of twelve. A study of spacing in the college classroom might well include age of subjects to investigate whether differences may be produced by socialization.

Sex appears to have a definite influence on spacing, with females generally using less space and opposite-sex pairs requiring the least

amount of space. Certainly any investigation of spacing between instructors and students should include this variable.

Because social setting appears to influence how much distance people maintain, any investigation of spacing in the classroom should clearly define the structure or organization of the class, the role of the instructor, and the nature of the interaction between the instructor and students and among the students.

Topic under discussion appears to influence spacing with close physical distance being related to pleasant topics. For this reason any investigation of spacing should probably take this variable into consideration in some way.

### Methodology

Evans and Howard (1973), in reviewing personal space research, attributed the substantial lack of consistent findings to the lack of experimental controls in the research. They strongly advocated the use of objective measures so that experimenter bias could be avoided. They pointed out that many researchers have utilized procedures which depend on direct interpretation of the data by the experimenter. The following discussion of procedures used by previous researchers is an expansion of that provided by Evans and Howard (1973).

1. Student-experimenter approach and observation. Garfinkel (1964) had students approach friends' faces very closely and observe the reaction; the student-experimenters then reported their impressions of subjects'

reactions. Reported reactions included avoidance, bewilderment, and embarrassment.

2. Observation of people in their normal routines. This procedure has yielded much conflicting data. Studies of this nature were the following:

a. Aiello and Cooper (1972) used a sociometric form to have junior high students select five classmates of their own sex whom they "liked the most" and five whom they "liked the least." After three weeks, dyads took part in what they believed to be a survey about television. An observer recorded at 20-second intervals the distance and axis (body angle) between the dyad six times. The distance scale allowed for comparison of different sized persons by use of a 14-point scale based on body parts rather than absolute inches.

b. Baxter (1970) observed interpersonal spacing of 850 subjects pairs in several natural settings at various times over a two-month period. Ratings of interpersonal distance were made from an unobtrusive location in each setting.

c. Jones (1971) observed two-person interaction in four sub-cultures in New York: Black, Puerto Rican, Italian, and Chinese. He recorded one position at one instant in time when neither person in the dyad was moving. He gathered data by driving through the streets, stopping just long enough to record each observation, and then driving on.

d. Using a movie camera that fired once every 30 seconds King (1966) measured approach distance between pairs of children making

up triads. Triads were formed on the basis of a prior appraisal of friendly or unfriendly acts made by each member to each other member of a triad during free play.

e. Willis (1966) recorded distances between individuals at the moment conversation began. The distances were then related to the relationship between the individuals and to their sex, age, and race.

### 3. Study of approach distance toward animate or inanimate decoys.

Research of this nature involved studying approach behavior by having subjects approach animate or inanimate decoys and interact when appropriate.

a. Horowitz (1968) conducted a study in which 30 women patients, diagnosed as falling within schizophrenic, depressive, or neurotic gross categories, were asked to approach an object or person leading with various aspects of their own bodies and then to stop when getting closer would make them uncomfortable. Their final stances in relation to the object were photographed, and the distances and postures were measured on the basis of this record.

b. Kleck (1969) simulated a left-leg amputation through the use of a specially constructed wheelchair and observed proxemic behavior of persons interacting with the "disabled" person.

c. Kleck et al. (1968) had subjects approach decoys and interact when appropriate.

d. Leipold (1963) noted the chair a person occupied in relationship to a seated decoy under anxiety and praise conditions.

e. Rosenfeld (1965), in an attempt to determine whether interpersonal proximity is used as an instrumental act for the attainment of social approval, assigned female subjects approval-seeking or approval-avoiding roles; these subjects were then compared for their subsequent proximity to a female confederate in an otherwise unstructured social situation.

f. Sommer (1959) asked subjects to interact and then observed how they arranged themselves.

4. Subject report of personal space invasion. Kinzel (1970) had subjects indicate when a person had moved too close and then measured the distance between the experimenter's toes and the center of the room where the subject stood.

5. Observations of subjects as an experimenter approached them. Felipe and Sommer (1966) systematically staged invasion sequences under natural conditions. Without interacting with the subjects, the experimenters sat down quite close to people seated on benches and at library tables and observed their reactions.

6. Observation of behavior under invasion conditions. Fry and Willis (1971) conducted a study in which the personal space of adults was invaded in a public setting by children aged 5, 8, and 10. Both men and women were approached, and an equal number of boys and girls were used as invaders; two observers recorded the reactions of the invaded persons by observing the number of times that the subject moved away, leaned away, or exhibited excessive motor behavior when approached.



7. Forced choice seating study. Leibman (1970) set up conditions so that subjects had to choose one of three different seats: on an occupied six-foot bench, between two occupied three-foot benches, or between an empty three-foot bench and one occupied. This study consisted of native-born white and black female subjects who were exposed to one of the three conditions.

8. Forced violation of an experimenter's personal space. In this study by Barefoot et al. (1972), two male and two female experimenters were seated at one of three distances from a water fountain in a public building, forcing subjects to violate the experimenter's personal space in order to drink from a water fountain.

9. Subjects' rating of feelings during spatial invasion. Studies of this nature have required subjects to rate how they felt during spatial invasion by completing a scale such as a semantic differential.

a. Patterson and Sechrest (1970) structured an experiment as an interview in which the subject was to rate another person (a confederate) on a series of traits. The subject was led to believe he would be deceiving the confederate by informing him that the purpose of the study was to examine some opinions on campus issues. The interviews took place in the front row of a classroom, with the subject seated at one end of the row and the confederate seated from one to four seats from the subject. The distance between chairs was approximately 2 feet, resulting in separations of approximately 2, 4, 6, and 8 feet between the subject and the confederate.

The rated dimensions, all presented on seven-point scales, were friendliness, aggressiveness, extroversion, and dominance.

b. Porter et al. (1970) carried out an experiment to determine how proximity is perceived as a cue in dyadic interaction. Subjects held conversations with three confederates at distances of 2, 4, and 8 feet and then completed 21 seven-point rating scales.

Some attempts have been made to study personal space with more objective measures. These measures are of four different types: placing human figures on a field or using variations of this technique, making and analyzing movies of eye movements and hand tremors at various distances from the subjects to study their reactions, using psychomotor tasks or performance tasks as dependent measures, and using psychophysiological recording techniques as dependent measures.

Several studies fall within the first type--placing human figures on a field or using variations of this technique. In the Kuethé experiments (Kuethé, 1962a, 1962b, 1964; Kuethé & Stricker, 1963; Kuethé & Weingartner, 1964), subjects were asked to place human figures cut from felt on a felt field. They were free to arrange the figures in any manner. In Albert and Dabbs' experiment (1970), a friendly or hostile speaker delivered two persuasive messages to a subject seated at 1-2, 4-5, and 14-15 feet away from him. A social schemata task was completed before and after the subjects heard the speaker, under the guise of an aesthetic judgment task. The subjects' task was to manipulate three cardboard figures to describe two friends and a mutual enemy. The distance in inches between the heads

of the two friends was then recorded. Dorsey and Meisels (1969) administered a simulated personal space measure where subjects drew silhouettes representing themselves and silhouettes of people standing near them. Gottheil et al. (1968) employed a procedure whereby the same male interviewer took each subject into a room and both were seated in chairs placed in a constant initial position from trial to trial. After a brief discussion period, a photograph was taken of the positions of the subject and the interviewer while the subject was listening. Subjects then completed a projective social distance test consisting of six cylindrical magnets which were placed on a 2- x 3-foot metal board covered with white paper.

Guardo and Meisels (1971) used a silhouette placement technique. Hobbs (1966) used two techniques: (1) replacement (a pair of human figures and a pair of rectangles were presented on different boards and equally far apart. The subject was asked to replace the felt figures "exactly as far apart as they are now") and (2) free placement (human figures were used, representing mothers, fathers, and children. Children were asked to place the figures on the board "any way you like."). Levinger and Gunner (1967) devised a method for measuring social relationships called the Interpersonal Grid. The first version consisted of a felt board, 2 feet by 3 feet, mounted on Plexiglas with a grid glued to it. A revised version consists of miniatures of the felt figures reproduced in a sticky masking tape; the grid is a sheet of graph paper laid on top of an illuminated glass box. Little (1965) asked college students to place Plexiglas cutouts and live actresses in spatial schema for social interaction. Little et al. (1968)

used four figures constructed of black Plexiglas; the figures were cut to represent profile views of standing men. Pederson (1973) created the Pederson Personal Space Measure; using it, subjects simulate personal space by using stimulus figures representing human profiles. Weinstein (1965, 1967), using felt figures on flannel boards, asked subjects to position figures for dyad interaction.

Birdwhistell (1952) used the second type of objective measure. He made and analyzed movies of eye movements and hand tremors at various distances from the subjects to study their reactions.

The third type of objective measure--using psychomotor tasks or performance tasks as dependent measures--was used by Rawls et al. (1972). They conducted two experiments. In the first one, the measure involved eye-hand coordination, flexibility of closure, and visualization under three conditions of closeness. The second experiment employed an arithmetic task as the criterion measure; subjects were tested under two conditions of closeness.

The fourth type of objective measure consisted of using psychophysiological recording techniques as dependent measures. Dabbs (1971) measured palmar sweating under conditions of physical closeness. In this method pores containing sweat show up in a fingerprint; the number of sweat glands active at a given moment were then counted. McBride et al. (1965) tested galvanic skin response to varying amounts of closeness between subject and male or female experimenters.

The Comfortable Interpersonal Distance Scale (Duke & Nowicki, 1972; Duke & Mullens, 1973) represents a more recent attempt to create an objective measure of interpersonal distance. The scale is a paper-and-pencil instrument consisting of 80-mm lines representing, on one end, an entrance to a room and, on the other end, the location of the subject. Subjects respond to stimuli approaching them by making a mark on the line to indicate where they want the approaching person to stop so that they continue to feel comfortable.

In addition to recommending the use of objective measures, Evans and Howard (1973), among other proxemic researchers, suggest that further personal space investigation be done using multivariate techniques. Klukken (1972) and Little (1965) reported substantial agreement between some dependent measures; however, other researchers (Dorsey & Meisels, 1969; Evans & Howard, 1972; Gottheil et al., 1968; Pederson, 1973b) have found low correlation between dependent measures of personal space. This suggests that the various techniques may be measuring different aspects of behavioral responses to personal space invasion (Evans & Howard, 1973).

### A Review of Related Literature--

#### Summary and Relationship to the Present Research

This chapter has presented various definitions and theories of the concept of interpersonal distance. While the various definitions given are not in conflict and the various theories have much in common, the investigation herein is concerned with Duke and Nowicki's (1972) concept of interpersonal distance, as it seems to best represent the dimension under study

here. Also presented in this chapter was a discussion of early work in proxemics, beginning with its roots in individual distance in animals. Most behavioral scientists agree that territoriality exists in human beings also. Because of this, the work of proxemic researchers has direct implications for educators. A review of how people react to spatial invasion was then presented in this chapter. People do demonstrate the existence of personal space boundaries and do react when this space is threatened by invasion. Therefore, students can be expected to want instructors to stay far enough away from them so that they (the students) can continue to feel comfortable. As shown in this chapter, numerous variables appear to influence how people use space. American college students can be expected to be noncontact and to desire space between themselves and their instructors. Given current knowledge of proxemic behavior, any study of spacing between undergraduate college students and their instructors should consider, at the least, race of student and instructor, sex of student and instructor, and mode of instruction. Other factors to be considered or accounted for might well include angle of approach, topic under discussion, and certain demographic data.

The final part of the review of the literature consisted of investigating methodology used by previous researchers. The substantial lack of consistent findings in personal space research has been attributed to the lack of experimental controls in the research. Many researchers have utilized procedures which depend on direct interpretation of the data by the experimenter, although some attempts have been made to study personal space

with more objective measures. The Comfortable Interpersonal Distance Scale by Duke and Nowicki represents an objective attempt and is used in the present study (in a modified form).

The present study differs from previous research in that it investigates a previously unexplored spatial relationship (students and instructors) and studies the interaction among several independent variables.

# CHAPTER III

## DESIGN OF THE STUDY

### Introduction

The purpose of this study was to investigate variables associated with interpersonal distance between undergraduate college students and their instructors, considering the variables of race of student and instructor, sex of student and instructor, and mode of instruction.

Specific hypotheses tested were the following:

1. Students will maintain less distance from their instructors in interactive classes than in lecture classes.
2. Students will maintain less distance from female instructors than from male instructors.
3. Students will maintain less distance from black instructors than from white instructors.
4. (a) White students will maintain less distance from instructors than will black students, and (b) male students will maintain less distance from instructors than will female students.
5. Students will maintain less distance from instructors of the same race than from instructors of a different race: (a) white students will permit white instructors closer than black instructors, and (b) black students will permit black instructors closer than white instructors.
6. Students will maintain less distance from instructors of the opposite sex: (a) male students will permit female instructors closer



than male instructors, and (b) female students will permit male instructors closer than female instructors.

This chapter is a presentation of the procedures employed throughout the study.

### Sample and Sampling Procedures

The target population of this study was all black and white undergraduate college students. The experimentally accessible population consisted of the entire student body enrolled in undergraduate courses listed on the Spring 1976 semester schedule at the University of Houston Central Campus. Because of the difficulty of finding black students in randomly selected classes, the population frame became one of convenience. Two sets of classes were randomly selected by using a table of random digits: one set from the Spring 1976 semester schedule and one set from a list of courses comprising the Afro-American Studies Program.

The sample chosen consisted of fifty black male students, fifty black female students, fifty white male students, and fifty white female students enrolled in undergraduate classes randomly selected from the convenience population.

### Instrumentation

The Comfortable Interpersonal Distance Scale (CID) (Duke & Nowicki, 1972) is a measure for interpersonal distance. It was used in the present study to obtain measures of interpersonal distance between

undergraduate college students and types of instructors; subjects (students) provided the measures by completing the scale.

The CID is a paper-and-pencil measure in the form of a plane. The original scale (Appendix A) consisted of eight radii emanating from a common central point; each 80-mm radius was associated with a randomly numbered "entrance" to what was presented as an imaginary "round room." Subjects were asked to imagine themselves at the center point of the radii and to respond to imagined persons approaching them at various angles corresponding to the radii. Subjects were told to indicate how close they would allow each person by marking a line on the appropriate radius, i. e., the point at which they would begin to feel uncomfortable with the approacher's presence. Distance between the center and the mark was easily measurable (in mm); this procedure reflected the creators' assumption that interpersonal distance is a continuous variable. Eight radii were used so as to diagram complete body boundary areas; subjects were able to imagine that they were being approached from eight different directions, thus defining a closed personal space area (Duke & Nowicki, 1972).

Communication with Duke (1976) resulted in a modification in the instrument (Appendix B). To overcome the possibility of response symmetry, he suggested that each situation be responded to on a separate slip of paper. Each slip of paper consisted of one 80-mm horizontal line with a number at the left end and an X at the right end. Students were asked to imagine that they were sitting in a college classroom at the spot marked with an X; the number represented an entrance into the room. They

responded to imaginary instructors (stimuli) approaching them along the horizontal line by making a mark on the line indicating where they preferred the specific instructor to stop; that is, where they thought they might begin to feel uncomfortable with the instructor's closeness. Each slip of paper was collected in turn before presentation of the next stimuli. The students' responses were scored as the distance in millimeters between the mark on the specific line and X at the right end of the line.

The creators of the CID have reported evidence indicating high test-retest reliability. Three studies were conducted to obtain reliability. The first study involved 23 male and 21 female subjects who were enrolled in an introductory psychology course. They were all freshmen and members of the middle and upper middle socioeconomic class. Stimuli presented to them were "strangers of the same age as the subjects" and either of the "same sex" or "opposite sex." In the initial sessions, subjects responded with preferred comfortable interpersonal distances to direct approaches along one radius by each stimulus. The Marlowe-Crowne Scale was also administered to assess the potential confounding factor of social desirability. So that the creators of the CID could obtain test-retest reliability, they administered the CID to the same subjects with the same stimuli two weeks later. Obtained correlations with the Marlowe-Crowne scores were found to be nonsignificant (for males .03 for same sex and .18 for opposite sex; for females .18 for same sex and .10 for opposite sex). Test-retest reliabilities for males in this study

were .86 for a same-sex stimulus and .75 for opposite sex; for females the reliabilities were .84 for same sex and .85 for opposite sex.

The second and third studies conducted by Duke and Nowicki to establish reliability of the CID consisted of 61 male and 41 female high school students and 67 male and 84 female elementary students. Stimuli presented to them were same-sex and opposite-sex strangers. Test-retest correlations after four months for the high school subjects were as follows: for males, .68 for same sex and .79 for opposite sex; for females, .77 for same sex and .83 for opposite sex. Test-retest correlations after four months for the elementary students were as follows: for males, .45 for same sex and .40 for opposite sex; for females, .39 for same sex and .52 for opposite sex.

Using Crandall, Katkovsky, and Crandall's social desirability questionnaire, Duke and Nowicki found the relationship between CID scores and social desirability for both groups was not significant (range .04 - .16; median .08). They commented that the minimally acceptable reliabilities may have been related to the students' developmental transition (that is, their entering puberty and/or a behavior modification project the students were engaged in, designed to improve school performance and interpersonal relations among children and teachers).

An attempt was also made by Duke and Nowicki to determine the degree to which responses to stimuli in the CID correlated with actual preferred distances from parallel real-life stimuli. They summarized the work of two of their students; correlations between CID responses and actual approaches ranged from .65 for same sex to .71 for opposite

sex stimuli in a group of 26 male and 25 female white college students; correlations between CID responses and actual approaches were .83 for same sex and .84 for opposite sex in a sample of black college students.

Further validation studies were then performed on what they considered promising propositions regarding interpersonal distance relationships. These propositions were derived on the basis of previous review (Lett et al., 1969) and a search of recent literature. The first proposition was that people maintain greater distance from persons of a different race. To test this, Duke and Nowicki verbally presented two additional stimuli (same race, different race) using the previous procedure. When collapsed across sex, the results of six studies showed that persons of a different race were kept further away than those of the same race. The second proposition was that prepubescent children prefer opposite sex farther away than same sex. Using only same-race stimuli results, Duke and Nowicki found results consistent with previously reported findings. The third proposition--the more people like each other, the closer their interpersonal distance--was tested by administering the CID to 20 male and 20 female white college students. Stimuli were a same-sex friend, a same-sex stranger, an opposite-sex friend, and an opposite-sex stranger. Friends were permitted significantly closer than strangers for both sexes of stimulus and subject.

Several advantages were to be gained by using the CID rather than some other method. Real-life measures (as defined in Chapter I)

have at least three weaknesses; they are subject to confounding by uncontrolled variables such as clothing of the approacher or eyeglasses; they are difficult to obtain because observations and measures become unwieldy; and they must, of necessity, have limited stimuli and size (Duke and Nowicki, 1972, p. 122). While others (Tolor, Brannigan, and Murphy, 1970) have created a scale for assessing interpersonal distance, it does not take into consideration confounding effects such as sex, age, or race stimuli and the possibility that personal space is a continuum (Duke and Nowicki, 1972, p. 122).

### Pilot Study

A pilot study was conducted in two phases during March and April 1976. The purpose of the first phase was to refine procedures, while the purpose of the second phase was to answer a question that arose during the first phase.

The sample for the first phase was originally to consist of fifteen white male students, fifteen white female students, fifteen black male students, and fifteen black female students enrolled in randomly selected undergraduate classes at the University of Houston Central Campus.

The form of the CID scale used in the first phase of pilot study was that published by Duke and Nowicki in 1972 (Appendix A). During administration of the CID in the classes, the researcher asked the subjects to imagine themselves seated at the center point of the diagram (room) and to respond to imaginary instructors (stimuli) approaching them along a

particular radius by making a mark on the radius where they would prefer the specific instructor to halt, that is, where they think they might begin to feel uncomfortable with the instructor's closeness (proximity). Stimuli were presented in the same random fashion proposed for the actual study, each at a different "door"; students were asked to "turn and face" each door. The eight stimuli (instructors) presented were (in this order)

1. black male instructor in an interactive class
2. white female instructor in an interactive class
3. black female instructor in an interactive class
4. black female instructor in a lecture class
5. white male instructor in an interactive class
6. white male instructor in a lecture class
7. black male instructor in a lecture class
8. white female instructor in a lecture class

So that students would have more similar perceptions of stimuli presented, definitions of "interactive class" and "lecture class" were verbally provided to the subjects before administration of the scale.

Subjects' responses were scored as the distance in millimeters between the mark on a specific radius and the X at the end of the radius. -

Administration of the scale in four classes yielded a sample of 36 white males, 17 white females, 3 black males, and 7 black females. Discussions with university officials confirmed that blacks were few in number across campus. The decision was made that data from blacks were important enough to merit changing the sampling procedures for the actual study, as discussed earlier.

Two more problems discovered through discussions with subjects in the pilot study were that order of presentation might influence student response and that students might attempt to achieve symmetry in their responses on the scale. Duke (1976) suggested a way of overcoming the problem of symmetry, by using a different sheet for response to each stimuli with each sheet being collected in turn before presenting the next stimulus. To determine whether order of presentation could indeed influence student response (and to refine procedures using the modified CID scale), the second phase of the pilot study was performed. In this phase the scale was administered to four sections of the same undergraduate course, but the order of presentation of stimuli was different in each section. One group received the stimuli in the randomized order (that is, black male instructor in an interactive class, white female instructor in an interactive class, black female instructor in an interactive class, black female instructor in a lecture class, white male instructor in an interactive class, white male instructor in a lecture class, black male instructor in a lecture class, white female instructor in a lecture class); one received them in an alternating order (white male instructor in a lecture class, black female instructor in an interactive class, black male instructor in a lecture class, white female instructor in an interactive class, white female instructor in a lecture class, black male instructor in an interactive class, black female instructor in a lecture class, white male instructor in an interactive class), one received them with race alternated (black female instructor in a lecture class, white male instructor in an interactive class, black female instructor in an interactive class, white male instructor in a lecture class, black male



instructor in a lecture class, white female instructor in an interactive class, black male instructor in an interactive class, white female instructor in a lecture class), and the last received the stimuli with sex alternated (white female instructor in an interactive class, black male instructor in a lecture class, white male instructor in an interactive class, black female instructor in a lecture class, white male instructor in a lecture class, black female instructor in an interactive class, white female instructor in a lecture class, black male instructor in an interactive class). Eight response sheets for the scale were used, each collected in turn before presenting the next stimulus. These response sheets were later collated, and responses of fifteen randomly chosen subjects in each section were analyzed. The analysis consisted of establishing an overall mean response for each section and comparing the means of all four sections to determine whether a significant difference existed. Differences in means were 2.5 mm, which was not a significant difference. This indicated that order of presentation was of no real impact. Therefore, the decision was made to use a consistent order, the random order used in the first phase of the pilot study.

#### Procedure for Collecting the Data

The researcher administered the CID to an entire group (class) at a time rather than to individual subjects; therefore, permission had to be obtained from the instructors of the selected classes to administer the scale during regular class time.

The assumption was made that utilization of the CID would enable the researcher to examine systematically student-instructor interpersonal

distance and that, in responding to the measures of interpersonal distance, the students would share their true preferences. Each subject received one copy of the demographic data questionnaire (Appendix C) and one copy of the modified Comfortable Interpersonal Distance scale (eight small sheets). Demographic data were collected on the printed questionnaire prior to administration of the CID scale. So that this data could later be collated with response on the CID scale, the questionnaire and each sheet of the scale were numbered. Once students had completed the questionnaire and passed it in, the following instructions were given:

I am going to ask you to complete an exercise which may seem somewhat strange to you. Please bear with me and complete the exercise, and then I shall briefly explain its purpose.

Before we start, I need to give you two definitions. By lecture class I mean a class in which the instructor lecture or instructor discourse is the predominant mode of teaching; any interaction between one student and the instructor or one student and another is normally done with the remaining class members listening. An example is the English instructor lecturing in front of the room to the class about American authors. By interactive class I mean a class in which the predominant mode of instruction requires students to interact either on a one-to-one basis with the instructor or another student or in such a way that all students in the class are equally free to verbalize among themselves or with the instructor. An example is the typewriting or mathematics class where students work individually and at their own pace, or a management class which is experientially based and includes management games, simulations, or small-group activities.

I want you to "make believe" that the form in front of you is a college classroom. Each of the eight forms will represent a different situation. I am going to present eight situations to which you are to respond by making a mark on the appropriate line. After you have responded to each situation in turn, I will collect the appropriate form before we consider the next situation.

Imagine that you are sitting in a college classroom at the spot marked with an X and looking straight at door 1. I am going to tell you about a person who is going to come into the room through door 1, and I want you to make a mark on the line leading from door 1 to where you are sitting to show where you think you would begin to want the person to stop getting any closer to you. Imagine that coming through door 1 is a black male instructor in an interactive class. Make a mark on the line to show where you would like him to stop coming toward you. (Then tear off that form and turn it in.)

These instructions were repeated for each of the other stimuli.

The order of presentation was the same for all subjects and was randomly determined. (Instruments from students other than black or white were disregarded, as other races were not a consideration of the present study.) Scores were obtained by measuring, in millimeters, the distance between the point where the student was "sitting" and the mark made by the student.

### Treatment of the Data

Investigation of the primary hypotheses required examining both the main effects and interaction effects of the five variables. To accomplish this, a 2 (student race) by 2 (student sex) by 2 (instructor race) by 2 (instructor sex) by 2 (type of class) analysis of variance with repeated measures on the last three variables was computed to test the research hypotheses.

An analysis of variance technique makes possible a segregation of the sources of variations. As a result, determination can then be made as to whether differences between means owe their divergences to sex of student, sex of instructor, race of student, race of instructor, mode

of instruction, or to two or more. Additionally, when there are two possible sources of variations, the possibility of interaction exists. Interaction variations are those attributable not to one of two (or more) influences acting alone but to joint effects of the two (or more) acting together. If it turned out that black students maintained greater distance between themselves and instructors than did white students, that would be one direct and isolable effect. Race of student would be the main effect. If students maintained less distance from female instructors than from male instructors, sex of instructor would be another main effect. The unique effect of the two together (race of student and sex of instructor) may differ from the individual main effects. An interaction exists when the effects of an independent variable are different for different levels of another variable, that is, an interaction exists between race of student and sex of instructor if black students prefer female over male instructors whereas white students prefer male over female instructors. The coincidence of sex and race of instructor and sex and race of student may produce systematic variation in one direction from the general mean of scores. If this occurs, it is an example of interaction variance. (Guilford & Fruchter, 1973, p. 249)

For the above reasons then, the data collected were analyzed by performing an analysis of variance with repeated measures on three variables which determined the effect of each independent variable by itself and the interactions of the variables on the dependent variable.

When an interaction was found to be significant, Tukey's Honest Significant Difference Test (Runyon-Haber, 1974) was done to investigate specific hypotheses. When computing an analysis of variance with repeated measures, four assumptions are made: (1) that the samples have been drawn from populations that are normally distributed; (2) that the variances within the groups are the same; (3) that the measures to be analyzed are continuous measures with equal intervals (Kerlinger, 1973, p. 286-288), and (4) that homogeneity of the covariance matrices exist (Kirk, 1968, p. 256). The nature of the sampling in this study must be kept in mind; that is, the fact that samples were drawn from two lists of University of Houston Central Campus undergraduate classes--the total semester schedule and the schedule of classes for the Afro-American Studies Program. While no difference other than racial makeup was apparent to this researcher, that did not rule out the possibility of differences. However, the decision was made to analyze data in this study by use of a parametric statistical test rather than a nonparametric one in light of Kerlinger's comments (Kerlinger, 1973, p. 287):

The evidence to date is that the importance of normality and homogeneity is overrated. . . . Unless there is good evidence to believe that populations are rather seriously nonnormal and variances are heterogenous, it is usually unwise to use a nonparametric statistical tool in place of a parametric one. . . . Parametric tests are almost always more powerful than nonparametric tests.

An additional reason for viewing these findings as tentative is the artificiality of the situation. Even though the CID has acceptable

reliability and validity, it is not a real-life observation; hence, it may reflect subjects' perceptions as well as their actions.

Further treatment of the data included the following:

(a) presenting the range of preferred distances within groups in table form (Appendix D). That was done to show the degree of variability within groups and among groups of subjects; and

(b) calculating means, medians, modes, and standard deviations for the demographic data provided by the subjects to determine such information, where appropriate, about the ages of subjects, number and ages of siblings, income level of early family, and domicile during first twelve years of subjects' lives (Appendix E).

Summarizing the procedures, first a demographic questionnaire and the modified Comfortable Interpersonal Distance scale were administered to subjects a class at a time; all subjects received the stimuli in the same order. Next, scores for interpersonal distance between undergraduate college students and instructors were obtained by measuring in millimeters the distance indicated by the subjects on the CID; that is, the distance between the point where the student was "sitting" and the mark made by the student on the scale. The data from the CID were analyzed by performing an analysis of variance with repeated measures. When interactions were found, Tukey tests were computed to determine the source of differences. The range of preferred distances within groups was presented in table form. Finally, the means, modes, and standard deviations of certain demographic data were calculated.

## CHAPTER IV

### RESULTS AND DISCUSSION

#### Introduction

The intent of this study was to investigate variables associated with interpersonal distance; that is, whether certain combinations of variables produce different interpersonal distances in instructor-student interactions, considering the variables of race of instructor, race of student, sex of instructor, sex of student, and mode of instruction (lecture or interactive).

The focal points of this study were the following primary hypotheses:

1. Students will maintain less distance from their instructors in interactive classes than in lecture classes.
2. Students will maintain less distance from female instructors than from male instructors.
3. Students will maintain less distance from black instructors than from white instructors.
4. (a) White students will maintain less distance from instructors than will black students, and (b) male students will maintain less distance from instructors than will female students.
5. Students will maintain less distance from instructors of the same race than from instructors of a different race: (a) white students

will permit white instructors closer than black instructors, and (b) black students will permit black instructors closer than white instructors.

6. Students will maintain less distance from instructors of the opposite sex: (a) male students will permit female instructors closer than male instructors, and (b) female students will permit male instructors closer than female instructors.

In this study undergraduate college students at the University of Houston Central Campus were given the CID. The sample consisted of 50 white male students, 50 white female students, 50 black male students, and 50 black female students. Data consisted of student responses to eight stimuli (instructors); students indicated on an 80-mm line (representing an entrance into a classroom at one end of the line and the spot where they were sitting at the other end) the point at which they would want certain instructors to stop approaching them so that they could continue to feel comfortable.

Table 1 shows the means and standard deviations across categories (in mm). (The ranges of these categories are shown in Appendix E.) Data from this table were collapsed for discussion of the hypotheses.

Table 2 shows the calculations of the F ratios and their comparison to an F table. In this study four of the five main effects were significant: race of student, sex of instructor, race of instructor, and mode of instruction. Had no interactions been found to exist, interpretation would have been clear. However, because some interactions were significant, the outcomes of the tests for main effects became clouded.



Table 1  
Interpersonal Distance  
Means and Standard Deviations Across Categories<sup>a,b</sup>  
(in mm)

		Instructors								
		Male				Female				
		Black		White		Black		White		
		Lecture Class	Interactive Class	Lecture Class	Interactive Class	Lecture Class	Interactive Class	Lecture Class	Interactive Class	
Students	Female	White	Mean = 36.02 S.D. = 17.03	Mean = 25.78 S.D. = 17.56	Mean = 29.78 S.D. = 16.94	Mean = 20.04 S.D. = 14.07	Mean = 34.10 S.D. = 17.60	Mean = 23.83 S.D. = 15.19	Mean = 31.86 S.D. = 17.61	Mean = 21.70 S.D. = 16.02
		Black	Mean = 28.44 S.D. = 19.09	Mean = 21.12 S.D. = 17.80	Mean = 42.84 S.D. = 23.68	Mean = 39.50 S.D. = 20.45	Mean = 31.20 S.D. = 19.42	Mean = 24.98 S.D. = 17.26	Mean = 41.92 S.D. = 22.54	Mean = 34.94 S.D. = 19.30
	Male	White	Mean = 30.44 S.D. = 16.95	Mean = 23.22 S.D. = 19.61	Mean = 31.02 S.D. = 17.48	Mean = 24.72 S.D. = 18.37	Mean = 29.68 S.D. = 16.86	Mean = 23.52 S.D. = 16.99	Mean = 26.58 S.D. = 18.63	Mean = 20.42 S.D. = 16.22
		Black	Mean = 34.74 S.D. = 19.14	Mean = 23.40 S.D. = 16.81	Mean = 47.46 S.D. = 17.62	Mean = 36.44 S.D. = 20.85	Mean = 27.02 S.D. = 19.80	Mean = 14.90 S.D. = 12.79	Mean = 36.32 S.D. = 21.47	Mean = 27.14 S.D. = 20.84

<sup>a</sup><sub>n</sub> = 50 for each category.

<sup>b</sup>The ranges of these categories are shown in Appendix E.

Table 2

Analyses of Variance:  
Interpersonal Distance Measures

<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F</u>
Race of Student (2) <sup>a</sup>	1	9,890.3	9,890.31	*6.41
Sex of Student (3)	1	1,493.8	1,493.83	.97
Race of Instructor (4)	1	10,050.1	10,050.08	**29.95
Sex of Instructor (5)	1	3,158.4	3,158.45	**20.89
Mode of Instructor (6)	1	27,922.4	27,922.41	**81.18
Interaction (2 x 3)	1	24.0	24.0	.02
Within sets (1 within 2, 3)	196	302,561.0	1,543.68	
Within sets (1 x 4 within 2, 3)	196	65,771.5	335.57	
Interaction (2 x 4)	1	22,921.9	22,921.89	**68.31
Interaction (3 x 4)	1	59.3	59.27	.18
Interaction (2 x 3 x 4)	1	52-.2	522.17	1.56
Within sets (1 x 5 within 2, 3)	196	29,631.9	151.18	
Interaction	1	1,079.1	1,079.10	**7.14
Interaction (3 x 5)	1	3,416.4	3,416.40	**22.60
Interaction (2 x 3 x 5)	1	1,281.7	1,281.65	**8.48
Within sets (1 x 6 within 2, 3)	196	67,413.1	343.94	
Interaction (2 x 6)	1	2.1	2.09	.01
Interaction (3 x 6)	1	44.2	44.22	.13
Interaction (2 x 3 x 6)	1	1,857.6	1,857.62	*5.40
Within sets (1 x 4 x 5 within 2, 3)	196	19,039.0	97.14	
Interaction (4 x 5)	1	455.8	455.80	*4.69
Interaction (2 x 4 x 5)	1	388.1	388.14	*4.00
Interaction (3 x 4 x 5)	1	98.0	98.03	1.01
Interaction	1	891.0	890.98	**9.17
Interaction (4 x 6)	1	103.0	103.01	1.50
Within sets (1 x 4 x 6 within 2, 3)	196	13,479.0	68.77	
Interaction	1	39.7	39.74	
Interaction (3 x 4 x 6)	1	.1	.10	.00
Interaction (2 x 3 x 4 x 6)	1	.2	.17	.00
Interaction (5 x 6)	1	.6	.64	.01
Within sets (1 x 5 x 6 within 2, 3)	196	15,727.0	80.24	
Interaction	1	7.0	7.04	.09
Interaction	1	41.6	41.59	.52
Interaction	1	5.3	5.28	.07
Interaction (4 x 5 x 6)	1	17.2	17.24	.29
Within sets (1 x 4 x 5 x 6 within 2, 3)	196	11,529.8	58.83	
Interaction (2 x 4 x 5 x 6)	1	.8	.77	.01
Interaction	1	70.6	70.55	1.20
Interaction	1	95.1	95.08	1.62

<sup>a</sup>Numbers in parentheses designate the symbol for the variable named; the number 1 refers to subjects.

\* $p < .05 = 3.90$ .

\*\* $p < .01 = 6.77$ .

Table 3  
Summary of Hypothesized Results  
and Significant Interactions--  
Analyses of Variance:  
Interpersonal Distance Measures

<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F</u>
Race of Student (2) <sup>a</sup>	1	9,890.3	9,890.31	*6.41
Sex of Student (3)	1	1,493.8	1,493.83	.97
Race of Instructor (4)	1	10,050.1	10,050.08	**29.95
Sex of Instructor (5)	1	3,158.4	3,158.45	**20.89
Mode of Instruction (6)	1	27,922.4	27,922.41	**81.18
Interaction (2 x 4) rs x ri	1	22,921.9	22,921.89	**68.31
Interaction (2 x 5) rs x si	1	1,079.1	1,079.10	**7.14
Interaction (3 x 5) ss x si	1	3,416.4	3,416.40	**22.60
Interaction (4 x 5) ri x si	1	455.8	455.80	*4.69

<sup>a</sup>Numbers in parentheses designate the symbol for the variable named; the number 1 refers to subjects.

\* $\underline{p} < .05 = 3.90$ .

\*\* $\underline{p} < .01 = 6.77$ .

Therefore, only hypothesized findings and two-way interactions are discussed herein.

Table 3 is the summary table of hypothesized results and significant interactions that are discussed in this chapter.

### Discussion of Results

Tables 1 and 2, presented on the preceding pages, are discussed in this section in light of specific research hypotheses. Table 1 shows the means and standard deviations across categories of subjects, and Table 2 presents  $F$  values for the analysis of variance of the interpersonal distance measures. To avoid logical inconsistencies, some hypotheses and unhypothesized two-way interactions are discussed together. These discussions are grouped by variable: mode of instruction, sex, and race.

#### Mode of Instruction

Main Effect: Hypothesis 1. Students will maintain less distance from their instructors in interactive classes than in lecture classes.

The analysis of variance data from Table 2 indicate a significant mode of instruction effect,  $F(1, 196) = 81.18$ ,  $p < .01$ .

Collapsing data in Table 1 indicates the mean distance measures of all students in interactive classes (25.4 mm) and in lecture classes (33.7 mm). Therefore, the research hypothesis is accepted.

Results. These means indicate that in general students tend to maintain less distance between themselves and instructors in interactive classes than in lecture classes.

Discussion. Personal space appears not to be fixed; rather, it seems to be flexible and its size can be manipulated. One way that the size of students' personal space can be manipulated appears to be by varying the mode of instruction. Lecture is one mode of instruction while interaction is another. Apparently, differences exist between the interactive class and the lecture class that cause spatial boundaries to change. Differences between the two modes of instruction include different communication patterns, varied physical environments, and different perceptions.

Communication barriers seem to be lowered in the interactive class; certainly, the patterns of communication vary. In the lecture class, verbal communication usually flows from the instructor to the class as a whole. In the interactive class, the communication flow may be from the instructor to one student; from one student to another student, the instructor or a group of students; or some other combination. The physical environments in the lecture class and the interactive class usually differ. Sommer (1969) points out that the usual spatial layout of straight rows of chairs oriented toward the teacher suggests on a nonverbal level the authority-oriented flow of communication from teacher to student. In the interactive class, students may be in circles,

on the floor, in small groups, or other arrangements; this spatial freedom results in more fluid interaction patterns and, hence, probably impacts on spacing.

Student perceptions may vary, depending on whether the class is lecture or interactive. The permission, and even encouragement, students receive to interact more verbally may carry with it an implied permission to interact more closely physically. Students' views of authority may also vary; with the interaction may come a perception of shared authority. The role of the instructor may be perceived as friendlier and less authoritative and perhaps, therefore, less threatening.

Additionally, because eye contact is valued in the American society, students may expect interaction to take place at a closer distance so that increased eye contact is possible.

Comparison to previous research. The results of this hypothesis support the work of Aiello and Cooper (1972), Gottheil et al. (1968), Guardo and Meisels (1971), King (1966), Little et al. (1968), and Rosenfeld (1965). Although conclusions are similar, none of the mentioned researchers considered samples of students and instructors. Aiello and Cooper (1972) studied spacing of junior high students from their classmates; Gottheil et al. (1968) used female undergraduates and single female employees to determine distances from male interviewers; Guardo and Meisels' (1971) sample consisted of boys and girls in Grades 3 through 10; King's (1966) sample was preschool children. Little et al.

(1968) asked college students to place Plexiglas cutouts and live actresses in spatial schema for social interaction; degree of acquaintanceship were "very good friends," "casual acquaintances," and "strangers." Rosenfeld's (1965) subjects were female students enrolled in an introductory psychology class; he was investigating proximity from a female confederate in "approval-seeking" or "approval-avoiding" roles.

While subjects investigated by these researchers differ from the present research, results are comparable in that certain components of the psychological relationships are common: friendliness or approachability and status.

### Sex

The following discussion is a presentation of data relative, first, to the main effect of sex of instructor; second, to the main effect of sex of student; and, third, to the two-way interaction of sex of instructor and sex of student. This presentation is followed by a discussion of results and a comparison to previous research related to sex and spacing.

Main Effect: Hypothesis 2. Students will maintain less distance from female instructors than from male instructors. The analysis of variance data from Table 2 indicate a significant sex of instructor effect,  $F(1, 196) = 20.89$ ,  $p < .01$ .

Collapsing data in Table 1 indicates the mean distance measures of students from female instructors (28.1 mm) and from male instructors (30.9 mm). The research hypothesis is accepted.

Results. These means suggest that students (considered as a group and not broken down into racial or sexual categories) maintain less distance from female instructors than from male instructors.

Main Effect: Hypothesis 4b. Male students will maintain less distance from instructors than will female students. The analysis of variance indicates a nonsignificant sex of student effect,  $F(1,196) = .97, p > .05$ .

Collapsing data in Table 1 indicates the mean distance measures of male students (28.6 mm) and of female students (30.5 mm) from all instructors. Therefore, the research hypothesis is not supported.

Results. These means suggest that male and female students maintain approximately the same distance from instructors in general.

Interaction Effect: Hypothesis 6. Students will maintain less distance from instructors of the opposite sex: (a) male students will permit female instructors closer than male instructors, and (b) female students will permit male instructors closer than female instructors. The analysis of variance indicates a significant interaction effect of sex of student and sex of instructor,  $F(1,196) = 22.6, p < .01$ .



Collapsing data in Table 1 yields the mean distance measures depicted in Figure 1.

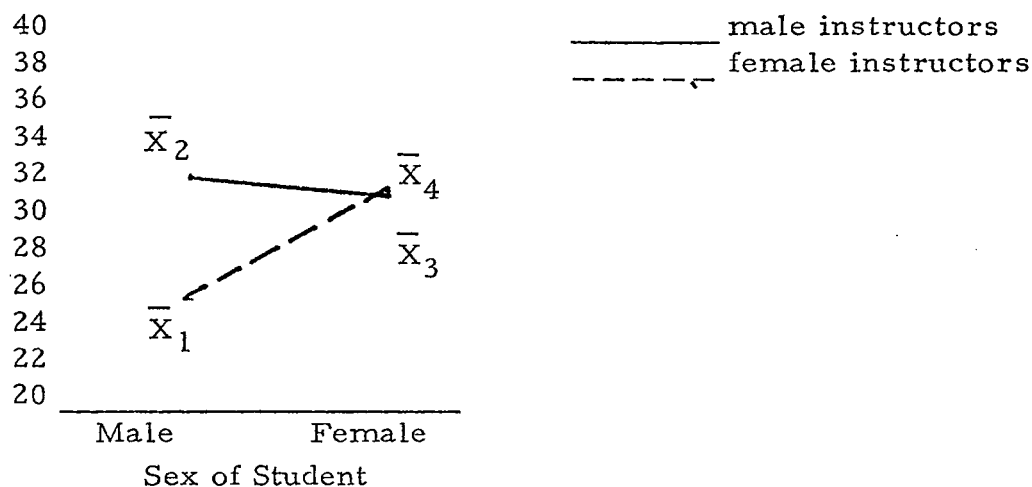


Figure 1. Mean distances maintained from male instructors and female instructors by male students and female students.

Tukey multiple comparisons are presented in Appendix F,

Table F.1.

Results. These data indicate that male students tend to permit female instructors closer than male instructors but that female students do not differentiate between female instructors and male instructors in their spacing.

Discussion. These results support the idea that personal space is not fixed; sex appears to be a variable which influences spacing between undergraduate college students and their instructors. Its influence is seen in the following ways: Students in general maintain less distance from female instructors than from male instructors. Male and female students maintain approximately the same distance

from instructors in general. Male students permit female instructors closer than male instructors; female students do not differentiate between male instructors and female instructors.

Several factors may account for these results. People are generally attracted to those of the opposite sex, and attraction and affiliation result in closer proximity. However, the cross-sex preference may be operative primarily in relations involving male students and female instructors only; female students may be concerned about sexual overtones and/or status differential and therefore may, for comfort's sake, prefer that male instructors stay as far away as female instructors. Garfinkel (1964) has reported that when spatial violation occurs, the victim may consider sexual intent to be the motivating force behind the violator's behavior. Female students may desire proximity with male instructors (because of the cross-sex attractiveness) but may have a concurrent desire for greater space from male instructors because of a perceived status differential. Males have traditionally been accorded higher authority and status than females. While societal views are changing, tradition dies slowly; many undergraduates were reared with the traditional viewpoint, unconsciously or otherwise. Because persons perceived to be of higher status or authority are generally allowed more space, the effect of a status differential in female student-male instructor interactions is to offset any existing cross-sex attractiveness.

Garfinkel's "sexual intent" theory may also account for the greater distance male students prefer from male instructors (as

compared to their distance from female instructors); male students may be concerned about homosexual appearances and, therefore, may feel more comfortable with greater distance between themselves and male instructors.

Attraction and affiliation may enter as factors in spacing in a second way (in addition to the cross-sex preference), this time as feelings for females. Females have traditionally filled warm, nurturing, supportive roles in most people's lives. These feelings may carry over into the classroom, where female instructors are endowed with positive affect, resulting in students desiring proxemic relations with them in general. Attraction to females may be valid for males and females; but, because of the "sexual intent" theory and concern about homosexual appearances, female students may be uncomfortable with physical closeness to female instructors. The attraction and the discomfort may, therefore, negate each other so that female students maintain approximately the same distance from female instructors as they do from male instructors.

Comparison to previous research. Since previous research findings about sex and spacing have been mixed, these results support some and disagree with others.

These findings agree with Willis's (1966) report that women were approached more closely than men; his subjects were an "incidental sample" of 755 subjects obtained in homes, places of business, and in the halls of a university.

Of the numerous spatial studies reported in the literature that consider sex of interactants, one by Little (1968) included superior-subordinate relations and interaction with an authority figure. The subjects were native-born undergraduate college students in the Universities of Denver, Naples, Lund, and Edinburgh and Greek students at Pierce College and the Athenian Polytechnical Institute. Subjects were instructed to place pairs of dolls, of the same sex as the subject, on newsprint so that they "looked natural" for specified transactions (including transactions between students and instructors). Little reported that women saw transactions of women with authority figures or superiors taking place at a greater distance than men viewed similar transactions of male figures. (Since subjects in Little's study were always the same sex as the stimulus figures, this conclusion could not be generalized to cross-sex judgments.) Results of the present research differ from Little's, as interaction distances are approximately the same for male-male pairs as for female-female pairs.

Considering cross-sex spacing, these findings support those of Horowitz (1965); he found that, when male subjects used personal comfort as a criterion for interpersonal proximity, they placed a greater distance between themselves and a male than between themselves and a female. (His subjects were schizophrenic patients and nonschizophrenic volunteers--both males and females--who were asked to approach other males or females or inanimate objects.)

The results of the present study do not support one of Pederson and Heaston's (1972) findings, that both males and females positioned females closer than males; the present study does support their finding that no difference existed in the distance that males and females positioned males. Pederson and Heaston's subjects were twenty males and twenty females between the ages of 18 and 30 enrolled in a psychology class; they were asked to perform two tasks: to place male and female paper profiles, and to indicate when they would feel uncomfortable if an unfamiliar person moved closer.

### Race

The following discussion is a presentation of data relative, first, to the main effect of race of instructor; second, to the main effect of race of student; and, third, to two-way interactions involving race found to be significant. This presentation is followed by a discussion of results and a comparison to previous research related to race and spacing.

Main Effect: Hypothesis 3. Students will maintain less distance from black instructors than from white instructors. In Table 2, the analysis of variance indicates a significant race of instructor effect,  $F(1,196) = 29.95, p < .01$ .

Collapsing data in Table 1 indicates the mean distance measure of all students from white instructors (32.0 mm) and from black instructors (27.0 mm). Therefore, the research hypothesis is accepted.

Results. These means suggest that students (considered as a total group) maintain less distance from black instructors than from white instructors.

Main Effect: Hypothesis 4a. White students will maintain less distance from instructors than will black students. The analysis of variance reported in Table 2 indicates a significant race of student effect,  $F(1,196) = 6.41$ ,  $p < .05$ . ✓

Collapsing data in Table 1 gives mean distance measures of white students (27.0 mm) and of black students (32.0 mm). Therefore, the research hypothesis is accepted.

Results. These means suggest that white students (considered as a total group) maintain less distance from instructors than do black students.

Interaction Effect: Hypothesis 5. Students will maintain less distance from instructors of the same race than from instructors of a different race: (a) white students will permit white instructors closer than black instructors, and (b) black students will permit black instructors closer than white instructors. In Table 2 the analysis of variance indicates a significant interaction effect of race of student and race of instructor,  $F(1,196) = 68.31$ ,  $p < .01$ .

Collapsing data in Table 1 indicates the mean distance measures depicted in Figure 2.

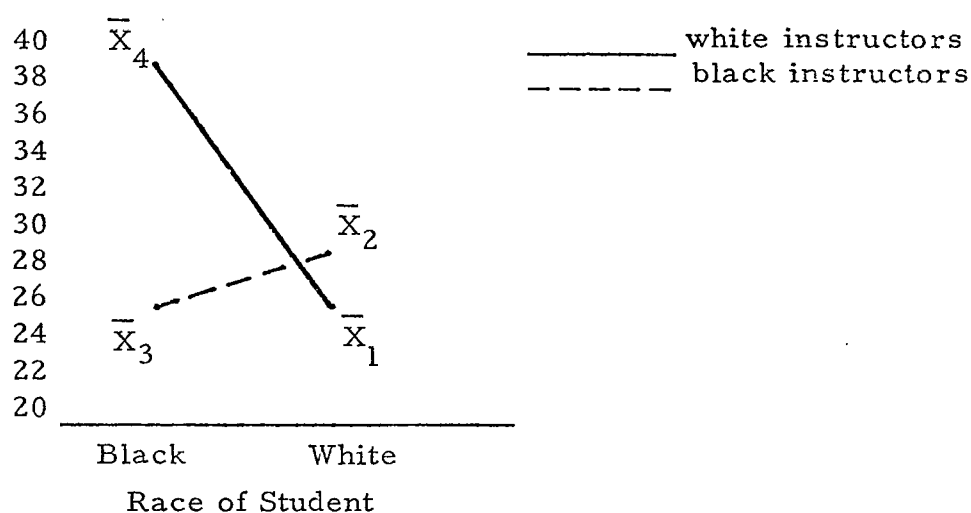


Figure 2. Mean distances maintained from black instructors and white instructors by black students and white students.

Tukey multiple comparisons are presented in Appendix F,

Table F. 2.

Results. These means indicate that black students differentiate between black instructors and white instructors, allowing black instructors closer; however, white students permit white instructors and black instructors at approximately the same distance.

Interaction Effect: Race of Student by Sex of Instructor. In Table 2, the analysis of variance indicates a significant interaction effect of race of student and sex of instructor,  $F(1, 196) = 7.14, p < .01$ .

Collapsing data in Table 1 indicates the mean distance measures depicted in Figure 3.

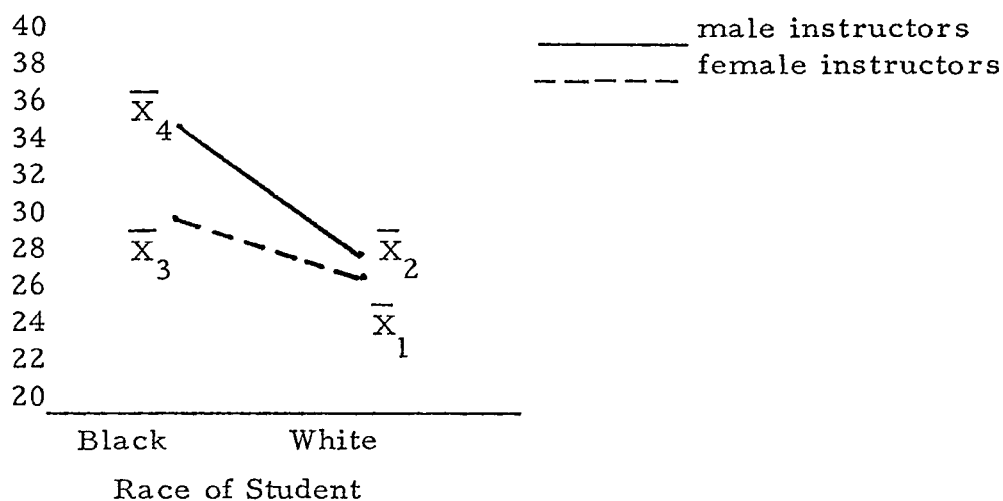


Figure 3. Mean distances maintained from male instructors and female instructors by black students and white students.

Tukey multiple comparisons are presented in Appendix F, Table

F.3.

Results. These means suggest that black students maintain greater distance from male instructors than from female instructors; but, white students do not differentiate between male instructors and female instructors.

Interaction Effect: Race of Instructor by Sex of Instructor. In Table 2, the analysis of variance indicates a significant interaction effect of race of instructor and sex of instructor,  $F(1,196) = 4.69$ ,  $p < .05$ .

Collapsing data in Table 1 indicates the mean distance measures depicted in Figure 4.



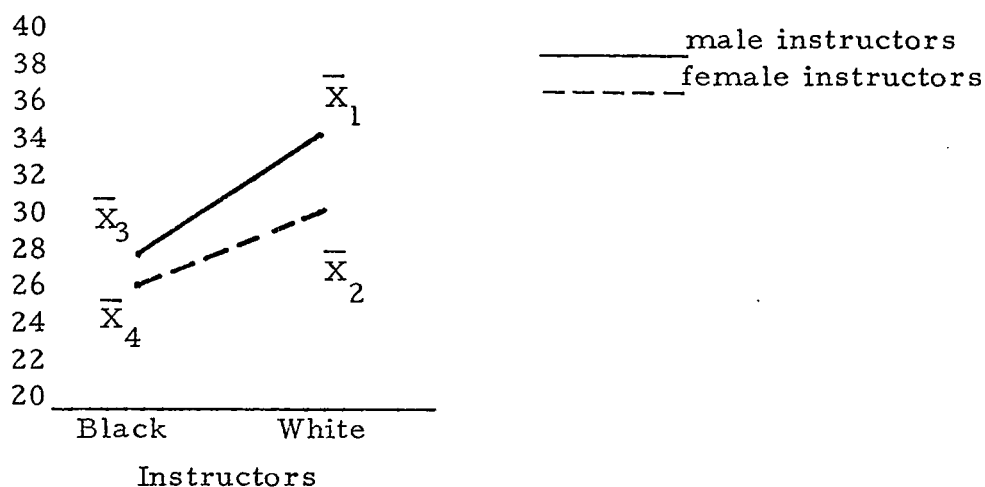


Figure 4. Mean distances maintained from black female instructors, black male instructors, white female instructors, and white male instructors.

Tukey multiple comparisons are presented in Appendix F,

Table F.4.

Results. These means indicate that (1) students (considered as a total group) maintain greater distance from white male instructors than from white female instructors and (2) they permit black male instructors and black female instructors at approximately the same distance.

Discussion. Like mode of instruction and sex of interactants, race appears to be a variable which influences spacing between undergraduate college students and their instructors. The influence of race is seen in the following ways: Students (as a total group) maintain less distance from black instructors than from white instructors. White students maintain less distance from instructors than do black students. Black students differentiate between black instructors and white

instructors, allowing black instructors closer; however, white students permit white instructors and black instructors at approximately the same distance. Black students maintain greater distance from male instructors than from female instructors; but, white students do not differentiate between male instructors and female instructors. Students (as a total group) maintain greater distance from white male instructors than from white female instructors, but they permit black male instructors and black female instructors at approximately the same distance.

Several factors may account for these results. Whites, like males, have traditionally performed high status roles and thus have been endowed with higher status than blacks. Because people tend to maintain distance from high status figures, this may explain why students in general maintain less distance from black instructors than from white instructors.

In the classroom, the instructor may be viewed as the authority or status figure. Space appears to be positively correlated with status discrepancy when the status of the one perceived is higher; assuming this and the difference in status of black students as perceived by black students may explain why black students maintain more distance from instructors than do white students.

People are generally attracted to those of the same race, and attraction and affiliation result in closer proximity; however, the same-race preference may be operative primarily in interactions involving black students and black instructors only. White students in this study

did not differentiate between black instructors and white instructors.

Two possible explanations exist as to why white students maintained about the same distance from black instructors as they did from white instructors: White students may desire greater distance from black instructors (because of the difference in race) but may have a concurrent feeling that close proximity is appropriate because of a perceived status differential (high status of whites, low status of blacks); these two distancings would, thus, negate each other. A second possible explanation is that the "boomerang" effect, as described by Knapp (1972), may be operative. He indicated that whites still judge blacks only by their skin color, but the judgment is indiscriminately positive rather than negative. This positive judgment may result in closer proximity.

The results of Hypothesis 2 showed that students (as a total group) maintain less distance from female instructors than from male instructors. However, considering the interaction of race of student with sex of instructor showed that white students appear to be unaffected spatially by the sex of the instructor. Black students maintain greater distance from male instructors than from female instructors; but, white students do not differentiate between male instructors and female instructors. A possible explanation is that the authority and status of the male instructor may be important to black students but not to white students.

When the interaction of race of instructor and sex of instructor was considered, results showed that while students in general maintain

greater distance from white male instructors than from white female instructors, they do not differentiate between black male instructors and black female instructors. Apparently, the role of the white male instructor is perceived as warranting additional space. Perhaps the status of white males in authority positions is carried over from society in general. Additionally, students may view race (blackness) as overriding sex of instructor and do not differentiate between males and females except with white instructors.

Comparison to previous research. Previous research findings about race and spacing have been mixed; therefore, these results support some and disagree with others.

This study supports Leibman's (1970) conclusion that white subjects were not influenced by race of the confederate and that black subjects showed a tendency to prefer intrusions with a black male over those of a white male. In his study subjects were native-born white and black females exposed to one of three conditions: intrusion-nonintrusion (subject could sit with confederate or not); free-seating choice; intrusion-choice (subject must sit with one of two confederates).

The results of this study differ from one made by Aiello and Jones (1971) in their study of black and white children. They found that whites maintained greater distance from each other than did blacks. (In the present study of students and instructors, no difference existed.)

This study also disagrees with Willis's (1966) report that pairs of whites stand closer together than do pairs of blacks; and that when

blacks and white interact, distance is greater than when members of the same race (black or white) interact. In the present study, cross-race interaction resulted in more space only for black students with white instructors. Willis's findings were obtained from an "incidental sample" of 755 subjects in homes, places of business, and in the halls of a university.

These findings also disagree with Duke and Nowicki's (1972) conclusion that persons of a different race are kept farther away than those of the same race. Their conclusion was based on the findings of six studies using three different age groups of blacks and whites (elementary, high school, and college). Stimuli were presented verbally and subjects responded on the CID scale. However, it is interesting to note that in their studies, the differences, while still significant, were less for college students than for high school students.

Other Significant Interactions. Other interactions found to be significant were race of student by sex of student by sex of instructor, race of student by sex of student by mode of instruction, race of student by race of instructor by sex of instructor, and race of student by sex of student by race of instructor by sex of instructor.

Tukey multiple comparisons are presented in Appendix F, Tables F.5, F.6, F.7, F.8.

No discussion is included because these were totally unexpected findings for which no hypotheses had been made.

### Summary of the Findings

Hypotheses accepted were the following:

Hypothesis 1. Students will maintain less distance from their instructors in interactive classes than in lecture classes.

Hypothesis 2. Students will maintain less distance from female instructors than from male instructors.

Hypothesis 3. Students will maintain less distance from black instructors than from white instructors.

Hypothesis 4.(a) White students will maintain less distance from instructors than black students.

Hypothesis 5.(b) Black students will permit black instructors closer than white instructors.

Hypothesis 6.(a) Male students will permit female instructors closer than male instructors.

Hypotheses not supported were the following:

Hypothesis 4.(b) Male students will maintain less distance from instructors than will female students.

Hypothesis 5.(a) White students will permit white instructors closer than black instructors.

Hypothesis 6.(b) Female students will permit male instructors closer than female instructors.

The interactions not hypothesized but found to be significant were the following:

--race of student by sex of instructor;  
--race of instructor by sex of instructor;  
--race of student by sex of student by sex of instructor;  
--race of student by sex of student by mode of instruction;  
--race of student by race of instructor by sex of instructor; and  
--race of student by sex of student by race of instructor by sex  
of instructor.

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### Summary

A thorough review of the literature on proxemics showed that one area needing investigation was interpersonal distance between undergraduate college students and instructors. Such information is needed because the nature of many courses and teaching methods requires close physical proximity of instructors and students. In an effort to humanize education, instructors are varying the spatial environments in classrooms. Since close physical proximity can produce defensive behaviors which may be disruptive to learning, instructors need information about variables related to distancing in student-instructor interactions.

The primary research hypotheses investigated in this study were:

1. Students will maintain less distance from their instructors in interactive classes than in lecture classes.
2. Students will maintain less distance from female instructors than from male instructors.
3. Students will maintain less distance from black instructors than from white instructors.
4. (a) White students will maintain less distance from instructors than will black students, and (b) male students will maintain less distance



from instructors than will female students.

5. Students will maintain less distance from instructors of the same race than from instructors of a different race: (a) white students will permit white instructors closer than black instructors, and (b) black students will permit black instructors closer than white instructors.

6. Students will maintain less distance from instructors of the opposite sex: (a) male students will permit female instructors closer than male instructors, and (b) female students will permit male instructors closer than female instructors.

A modified version of the Comfortable Interpersonal Distance Scale was used to collect data. Data consisted of student responses to eight stimuli (instructors); students indicated on an 80-mm line (representing an entrance into a classroom at one end of the line and the spot where they were sitting at the other end) the point at which they would want certain instructors to stop approaching them so that they could continue to feel comfortable. The eight instructors were:

1. black male instructor in an interactive class
2. white female instructor in an interactive class
3. black female instructor in an interactive class
4. black female instructor in a lecture class
5. white male instructor in an interactive class
6. white male instructor in a lecture class
7. black male instructor in a lecture class
8. white female instructor in a lecture class

Additionally, respondents provided demographic data in the form of questions relating to sex, race, age, number and ages of siblings, family economic status, and location of domicile during first twelve years of their life.

A pilot study was conducted to refine procedures and to determine whether order of presentation influenced responses.

The data were collected in classes randomly selected from two class lists: the University of Houston Central Campus Spring 1976 class schedule and the University of Houston Central Campus Afro-American Studies Program class schedule. The sample consisted of fifty black male students, fifty black female students, fifty white male students, and fifty white female students.

The data collected were analyzed by performing an analysis of variance with repeated measures on three variables which determined the effect of each independent variable by itself (mode of instruction, sex of instructor, sex of student, race of instructor, and race of student) or the interaction of the variables on the dependent variable (measure of interpersonal distance).

Where an interaction was found to be significant, Tukey's Honestly Significant Difference Test was done.

### Summary of the Findings

This study has been an attempt to determine whether certain combinations of variables produce different interpersonal distances in instructor-student interactions, considering the variables of race and sex of instructor, race and sex of student, and mode of instruction.

Hypotheses accepted were the following:

Hypothesis 1. Students will maintain less distance from their instructors in interactive classes than in lecture classes.

Hypothesis 2. Students will maintain less distance from female instructors than from male instructors.

Hypothesis 3. Students will maintain less distance from black instructors than from white instructors.

Hypothesis 4.(a) White students will maintain less distance from instructors than black students.

Hypothesis 5.(b) Black students will permit black instructors closer than white instructors.

Hypothesis 6.(a) Male students will permit female instructors closer than male instructors.

Hypotheses not supported were the following:

Hypothesis 4.(b) Male students will maintain less distance from instructors than will female students.

Hypothesis 5.(a) White students will permit white instructors closer than black instructors.

Hypothesis 6.(b) Female students will permit male instructors closer than female instructors.

The interactions not hypothesized but found to be significant were the following:

--race of student by sex of instructor;

--race of instructor by sex of instructor;

- race of student by sex of student by sex of instructor;
- race of student by sex of student by mode of instruction;
- race of student by race of instructor by sex of instructor; and
- race of student by sex of student by race of instructor by sex of instructor.

### Conclusions

1. Personal space appears not to be fixed; rather, it seems to be flexible and its size can be manipulated. Factors that were found to impact on spacing were status, attraction, and affiliation.

2. From a theoretical standpoint, status as an explanation for spacing was partially supported; while it seemed to influence distancing between students and instructors, expectations did not always hold true. Its diminishment in the interactive class resulted in less space. It seemed to produce the expected result when the decreased perceived status was in the stimulus (as in the interactive class, the female instructor, the black instructor). It did not always produce the expected result when the hypothesis was based on the respondent perceiving herself as "lower status" (as in female students and their spacing from instructors as a group and their spacing from male instructors and their spacing from female instructors). However, perceived lower self-status as an explanation for spacing of black students seemed to hold true (in spacing from instructors as a group, in spacing from white instructors and black instructors, and in spacing from male instructors and female instructors).

3. Attraction and affiliation were also partially supported as influencers of spacing between undergraduate college students and their instructors. The affiliation for females produced through socialization seems to carry over into the classroom so that students in general permit female instructors closer than male instructors. While a cross-sex preference was investigated, it was found to exist only for male students with female instructors. Similarly, while a same-race preference was investigated, it was found to exist only for black students with black instructors.

4. Garfinkel's theory of "sexual intent" in spatial violation gains importance in light of the results of this study. It may account for female students maintaining approximately the same distance from male instructors and female instructors and for male students preferring greater distance from male instructors.

5. The findings of the present study lend some support to Knapp's theory of a "boomerang" effect. He views this as a recent phenomenon in racial interactions, with the black person sometimes still judged only by his skin color; but the judgment is indiscriminately positive rather than negative. He attributes this phenomenon as an overaction caused by widespread guilt feelings among whites. If this is assumed to be true, the likelihood exists that white students may be attempting to demonstrate positive feelings toward black instructors by close proximity.

6. While arguments have been raised as to the effectiveness of one class structure over another, to be remembered is that both the

lecture class and interactive class are appropriate, depending on the situation. An instructor may decide, because of class size, instructional content, students' personalities or values, or a number of other reasons, that one method is more appropriate than the other. Caution must be exercised in choosing one method over the other so that the resulting effect is the one desired.

### Speculations and Implications

The previously presented conclusions are the basis for arriving at certain speculations and implications which can be supported by the data in this study. The following is a presentation of those speculations and implications.

1. Personal space is not fixed; rather, it appears to be flexible. Social differences among the four categories of subjects may account for some of the spatial differences found. An analysis of the demographic data revealed some of these social differences. Personality of instructors and students may be influential in student-instructor interactions. Duke and Nowicki (1972), in studying locus of control and spacing, reported that internals (people who feel they control their own fate) distance nonfamiliar authorities less than externals (those who perceive themselves as being controlled by forces outside themselves). This was also reported by Patterson and Holmes (1966), Patterson and Sechrest (1970), and Williams (1963). Present and recent past societal conditions may create more whites than blacks who are internals. Meisels and Cantor (1970), however, found no relationship. In that

regard, Eberts (1972) found that persons who lived alone, saw their friends as conservatives, and had lower self-acceptance scores, preferred more personal space. The implications of this for classroom applications are important; two current contradictory positions in education are held: (1) that instructors should learn as much as possible about students' social backgrounds (to understand students better) and (2) that instructors should know little or nothing about students' backgrounds (in order not to prejudge their abilities). If social differences prove to impact on spacing, then instructors may need information about students' social backgrounds in order to modify their behavior in student-instructor interactions.

2. Age may also produce different distancing norms and may explain some of the variability. An analysis of the demographic data showed that blacks were younger than whites in the sample (mean of black students = 20.9; mean of white students = 25.2). The standard deviations were 5.38 for white males, 6.93 for white females, 1.36 for black males, and 1.35 for black females.

3. The threat of uninvited sexual advances may also be a factor in spacing between students and instructors. Garfinkel (1964) suggested that sexual intent may be considered by the "victim" to be the motivating force behind the violator's behavior. In the instructional setting, students may interpret an instructor's physical closeness as an indicator of sexual interest and may become uncomfortable. Instructors should be sensitive to possible discomfort in students of either sex.

4. Because of socialization, black students' views of authority probably differ from white students'. Certainly, their reactions differed to the authority figure as represented here by the instructor. A plausible speculation is that the changing social scene will produce changes within the next generation or two of black students. Some aspects of the social scene which may impact directly or indirectly on how individuals perceive themselves include, in addition to racial equality, broadening personal freedoms, sexual freedom, and women's rights. The possibility also exists that counterforces may develop as a reaction to these changes which could make distances increase. The findings of this study represent information about the dynamics of human interactions, information that can be used to facilitate or hinder possible relationships in the classroom.

5. The difference in distance maintained in interactive classes and in lecture classes is dramatic enough to speculate that permission to interact has the same result as permission to maintain closer proximity. Mode of instruction affects spacing; the close psychological distance created by the interactive class encourages close physical interaction (breaking down communication barriers.) This difference also suggests that the authority figure is not the same in lecture and interactive classes. The instructor may use this information to create the psychological climate he desires or considers most effective in a particular situation.



6. Results of this study imply that black students appear to have the greatest sensitivity to spacing, particularly black male students. They maintained both the least distance and the greatest distance. Additionally, their spacing seems to be more predictable than the spacing of other categories of students, using the theoretical arguments presented in this study. An interesting speculation is whether blacks are more sensitive, in general, to all or other aspects of nonverbal communication and whether societal conditions have led them to develop a special awareness.

7. Personal space appears to be flexible. The results of this study lead to speculation of whether spacing reactions can be modified through training, such as role playing, and whether such modification has any advantages. While this may not be important in the classroom setting, the possibility exists that it might be advantageous to develop tolerance to close proximity of authority figures in the work situation. (Such training could be beneficial to instructors also, as discussed below.)

8. Because the teaching-learning process is essentially one of communication, the quality of the communication contributes to the instructional climate. Interpersonal distancing is an important part of the total communication process.

Previous researchers have identified two outcomes of proxemic relationships: a demonstration of warmth and interest through close

physical proximity, and defensive behaviors to protect from further invasion of personal space.

This study has shown that interpersonal distancing varies in instructor-student interactions. Instructors may need to keep this in mind when working with students. They may need to be aware of variables and combinations of variables which produce increased interpersonal distance and learn to recognize nonverbal cues in students that signal a desire for more or less proximal relations. Instructors themselves may initiate behaviors to decrease space by calling students by their first names, by encouraging discussion among and with students, by varying the physical environment, by varying eye contact, etc. Teacher training which includes this information could prove helpful to instructors in creating appropriate and effective instructional climates.

#### Recommendations for Future Research

One of the primary purposes of any investigation is to generate further hypotheses or research questions that serve as focal points for future research in the field. Such was the case with the present study. The following paragraphs are recommendations for future research.

1. An important area for further research is the validation of the effect of spacing on student learning. Identification of specific effects could then serve as the basis for teacher-education workshops in nonverbal communication.

2. Earlier it was speculated that societal changes may result in changes in spacing rites. An obvious recommendation for future research is to replicate this study within an appropriate time frame, such as every five years, to determine whether this is indeed true.

3. A third recommendation is that the present study be extended to yield actual distance measurements rather than scale distance. Such information could be incorporated in teacher-education workshops in nonverbal communication.

4. Another study that is recommended is the creation of a laboratory workshop in nonverbal communication. The laboratory should include the findings of the present research. An important aspect of the study of the lab design should be the evaluation phase to determine (1) whether instructors do develop an awareness of and sensitivity to spatial needs in students and (2) whether such sensitivity and awareness impacts on the students in a discernible manner.

5. A fifth recommendation offered here is that a study be conducted which focuses on student spatial needs across several levels, that is, at other institutions such as community colleges, smaller universities, other geographically located universities, universities with other ethnic/social/intellectual student bodies, professional (law, engineering, and so forth) as opposed to liberal arts schools and graduate schools. The present study focused on undergraduate students at one university. A study is needed which focuses on similarities and differences in spatial needs across several institutional and student levels.

6. The sixth recommendation is that further research be conducted to investigate the "boomerang" effect. This effect may prove to be an important first step in modifying people's behaviors and attitudes, or it may be a barrier to authentic change.

7. A final recommendation is that future research be conducted on reactions to change in status. Most people newly appointed to administration positions perceive (almost always nonverbally) a behavioral or attitudinal change in their former peers whom they are now supervising. This frequently adds to the adjustment problem of the new supervisor; in addition to the strain of new duties and responsibilities, he/she frequently feels a sense of isolation. Information about this phenomenon could be helpful in today's climate of affirmative action.

8. In this study, psychological distance and physical distance were considered to be aspects of interpersonal distance. Future research needs to be done to differentiate between psychological distance and physical distance and to ascertain relationships between them.

## APPENDICES

## APPENDIX A

## COMFORTABLE INTERPERSONAL DISTANCE SCALE

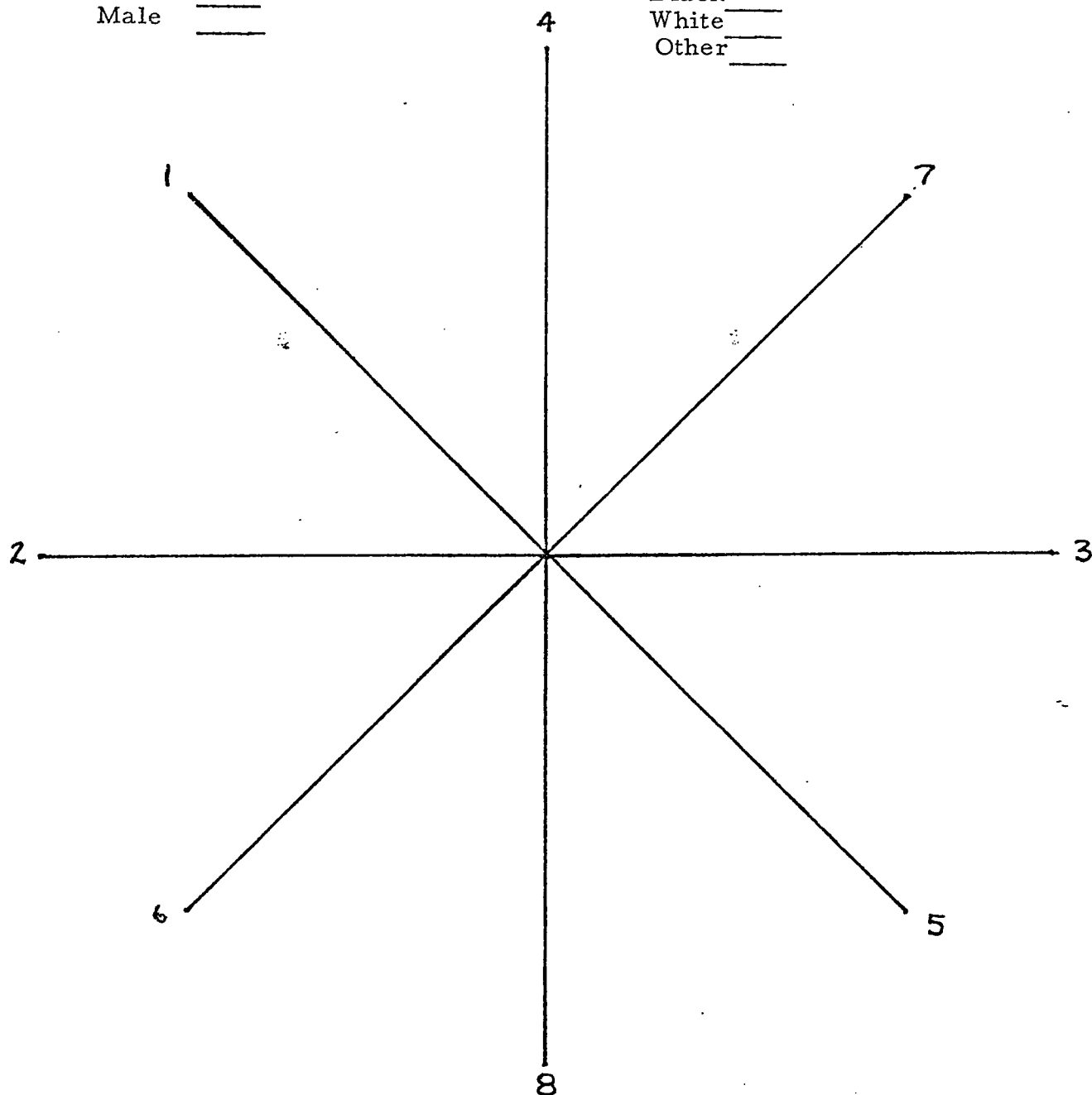
(ORIGINAL FORM)

Please answer the following questions by checking the appropriate lines and then follow the instructions of the person administering the scale.

Your sex?

Female ☐Male ☐

Your race?

Black ☐White ☐Other ☐

APPENDIX B

COMFORTABLE INTERPERSONAL DISTANCE SCALE

(MODIFIED FORM)

67

X

The form consists of eight strips of paper like that shown above, numbered 1 through 8. The number in the right margin of the form is used to collate responses with questionnaires.

## APPENDIX C

## DEMOGRAPHIC QUESTIONNAIRE

To help complete this study, please provide the following information. Be assured that your responses will be held in strict confidence. Please check the appropriate answer and fill in where necessary.

1. What is your sex?

Male \_\_\_\_\_

Female \_\_\_\_\_

2. What is your race?

White \_\_\_\_\_

Black \_\_\_\_\_

Other (please specify) \_\_\_\_\_

3. Please indicate the ages as of this date of all children in the family in which you were reared and circle your age.

\_\_\_\_\_

\_\_\_\_\_

4. When you were in elementary school, how would you rate the income level of the family in which you were reared?

Poor \_\_\_\_\_

Low middle \_\_\_\_\_

Middle \_\_\_\_\_

High middle \_\_\_\_\_

Wealthy \_\_\_\_\_

5. Where did you spend most of the first 12 years of your life? Please indicate the state if in the U.S. or the country if outside the U.S.

\_\_\_\_\_

\*6. What is your ethnic background? Please specify (for example, Italian, German, etc.).

\_\_\_\_\_

THANK YOU FOR YOUR ASSISTANCE.

\*This question was thrown out of the study, as it lacks clarity.



# APPENDIX D

## ANALYSIS OF DEMOGRAPHIC DATA

A final analysis of data consisted of investigating four demographic factors of the subjects: age, number of children in family, perceived income level of family when subject was growing up, and location of domicile during early life of subject.

### Age

Range, mean, median, mode, and standard deviation of ages were computed for all four categories of subjects: white males, white females, black males, and black females. Table 1 below shows these.

Table D.1

### Age of Subjects

<u>Category<sup>a</sup></u>	<u>Range</u>	<u>Mean</u>	<u>Median</u>	<u>Mode</u>	<u>Standard Deviation</u>
White Males	19 - 43	25.32	24	24	5.38
White Females	19 - 52	25.10	23	22	6.93
Black Males	19 - 25	21.14	21	20, 21	1.36
Black Females	18 - 25	20.66	21	20	1.35

<sup>a</sup>n = 50 for each category

Number of Children in Family

Table 2 below shows the mean and modal number of children in the families in which subjects in this study were reared.

Table D.2

Mean and Modal Number of Children in Family

<u>Category<sup>a</sup></u>	<u>Mean</u>	<u>Mode</u>
White Males	3.34	3
White Females	3.12	2
Black Males	4.16	6
Black Females	4.12	4

<sup>a</sup>n = 50 for each category

Table D.3

Position Among Siblings

<u>Category<sup>a</sup></u>	<u>First Born</u>	<u>Middle Born</u>	<u>Last Born</u>	<u>Only Child</u>
White Males	23	14	10	3
White Females	23	9	16	2
Black Males	14	26	8	2
Black Females	18	22	5	5

<sup>a</sup>n = 50 for each category

### Income Level

In response to the question, "When you were in elementary school, how would you rate the income level of the family in which you were reared?", subjects answered as shown in Table 4.

Table D.4

#### Income Level of Subjects' Families

<u>Category<sup>a</sup></u>	<u>Poor</u>	<u>Lower Middle</u>	<u>Middle</u>	<u>High Middle</u>	<u>Wealthy</u>
White Males	1	19	26	4	0
White Females	4	8	29	9	0
Black Males	8	23	16	3	0
Black Females	7	13	24	4	2

<sup>a</sup>n = 50 for each category

### Domicile during Early Life

In response to the question, "Where did you spend most of the first 12 years of your life?" (state, or country if outside United States), subjects responded in the way shown in Table 5.

Table D. 5

## Domicile during First 12 Years of Subjects' Lives

<u>Category<sup>a</sup></u>	<u>Texas</u>	<u>Outside Texas</u>	<u>Outside United States</u>
White Males	34	15	1
White Females	30	15	5
Black Males	41	6	3
Black Females	44	6	0

---

<sup>a</sup>n = 50 for each category

Summary of Demographic Data Provided by Subjects

Analyses of demographic data showed that whites were somewhat older than blacks in this study; whites had fewer siblings than blacks; while whites were more likely to be first borns, blacks were more likely to be middle borns. Three categories of subjects perceived their families income level to be middle; most black males perceived their families' income level to be lower middle. Most of the subjects in this study had spent their first 12 years in Texas.

# APPENDIX E

## Range of Interpersonal Distance Measures

(in mm) within Groups

Stimulus	White Male Subjects	White Female Subjects	Black Male Subjects	Black Female Subjects
	N= 50	N= 50	N= 50	N= 50
Black Male Instructor in an Interactive Class	1 - 76 Range = 75	2 - 65 Range = 63	2 - 80 Range = 78	0 - 62 Range = 62
White Female Instructor in an Interactive Class	1 - 76 Range = 75	1 - 67 Range = 66	2 - 80 Range = 78	3 - 80 Range = 77
Black Female Instructor in an Interactive Class	5 - 78 Range = 73	3 - 69 Range = 66	1 - 56 Range = 55	4 - 73 Range = 69
Black Female Instructor in a Lecture Class	4 - 73 Range = 71	3 - 66 Range = 63	1 - 70 Range = 69	3 - 70 Range = 67
White Male Instructor in an Interactive Class	1 - 76 Range = 75	2 - 58 Range = 56	3 - 80 Range = 77	3 - 80 Range = 77
White Male Instructor in a Lecture Class	2 - 76 Range = 74	3 - 66 Range = 63	4 - 80 Range = 76	3 - 79 Range = 76
Black Male Instructor in a Lecture Class	1 - 76 Range = 75	3 - 68 Range = 65	2 - 78 Range = 76	3 - 72 Range = 69
White Female Instructor in a Lecture Class	2 - 76 Range = 74	3 - 78 Range = 75	1 - 80 Range = 79	4 - 80 Range = 76

APPENDIX F

TUKEY TESTS FOR SIGNIFICANT DIFFERENCES

Table F.1

Differences in Mean Distances for Interaction  
of Sex of Student by Sex of Instructor

	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_4$
male students with female instructors $\bar{X}_1 = 25.7$		**5.7	**4.7	**4.9
male students with male instructors $\bar{X}_2 = 31.4$			1.0	.9
female students with male instructors $\bar{X}_3 = 30.4$				.1
female students with female instructors $\bar{X}_4 = 30.6$				

\*\*Significant differences at  $p < .01$ .

Table F.2

Differences in Mean Distances for Interaction  
of Race of Student by Race of Instructor

	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_4$
white students with white instructors $\bar{X}_1 = 25.8$		2.6	.1	**12.6
white students with black instructors $\bar{X}_2 = 28.3$			2.6	**10.0
black students with black instructors $\bar{X}_3 = 25.7$				**12.6
black students with white instructors $\bar{X}_4 = 38.3$				

\*\*Significant differences at  $p < .01$ .

Table F.3

## Differences in Mean Distances for Interaction

of Race of Student by Sex of Instructor

	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_4$
<u>white students with female instructors</u> $\bar{X}_1 = 26.4$		1.2	*3.4	**7.8
<u>white students with male instructors</u> $\bar{X}_2 = 27.6$			2.2	**6.6
<u>black students with female instructors</u> $\bar{X}_3 = 29.8$				**4.5
<u>black students with male instructors</u> $\bar{X}_4 = 34.2$				

\*Significant differences at  $p < .05$ .\*\*Significant differences at  $p < .01$ .



Table F.4

Differences in Mean Distances for Interaction  
of Race of Instructor by Sex of Instructor

	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_4$
<u>white male instructors</u> $\bar{X}_1 = 34.0$		**3.9	**6.1	**7.8
<u>white female instructors</u> $\bar{X}_2 = 30.1$			2.2	**4.0
<u>black male instructors</u> $\bar{X}_3 = 27.9$				1.7
<u>black female instructors</u> $\bar{X}_4 = 26.2$				

\*\*Significant differences at  $\underline{p} < .01$ .

Table F.5

Differences in Mean Distances for Interaction  
of Race of Student by Sex of Student by Sex of Instructor

	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_4$	$\bar{X}_5$	$\bar{X}_6$	$\bar{X}_7$	$\bar{X}_8$
white male students with male instructors $\bar{X}_1 = 27.4$		0.5	**8.1	**5.6	2.3	0.5	1.0	**5.9
white female students with male instructors $\bar{X}_2 = 27.9$			**7.6	**5.1	2.8	0.0	1.5	**5.4
black male students with male instructors $\bar{X}_3 = 35.5$				2.5	**10.4	**7.6	**9.1	2.2
black female students with male instructors $\bar{X}_4 = 33.0$					**7.9	**5.1	**6.6	0.3
white male students with female instructors $\bar{X}_5 = 25.1$						2.8	1.3	**8.2
white female students with female instructors $\bar{X}_6 = 27.9$							1.5	**5.9
black male students with female instructors $\bar{X}_7 = 26.4$								**6.9
black female students with female instructors $\bar{X}_8 = 33.3$								

\*\*Significant differences at  $p < .01$ .

Table F. 6

## Differences in Mean Distances for Interaction

of Race of Student by Sex of Student by Mode of Instruction

	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_4$	$\bar{X}_5$	$\bar{X}_6$	$\bar{X}_7$	$\bar{X}_8$
white male students in lecture classes $\bar{X}_1 = 29.4$		3.5	**7.0	**6.7	*6.4	**6.6	3.9	0.7
white female students in lecture classes $\bar{X}_2 = 32.9$			3.5	3.3	**9.9	**10.1	**7.4	1.8
black male students in lecture classes $\bar{X}_3 = 36.4$				0.3	**13.3	**13.8	**8.9	*6.3
black female students in lecture classes $\bar{X}_4 = 36.1$					**13.1	**13.3	**10.9	*6.3
white male students in interactive classes $\bar{X}_5 = 23.0$						0.2	2.5	**7.1
white female students in interactive classes $\bar{X}_6 = 22.8$							2.7	**7.3
black male students in interactive classes $\bar{X}_7 = 25.5$								4.6
black female students in interactive classes $\bar{X}_8 = 30.1$								

\*Significant differences at  $p < .05$ .\*\*Significant differences at  $p < .01$ .

Table F.7

Differences in Mean Distances for Interaction  
of Race of Student by Race of Instructor by Sex of Instructor

	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_4$	$\bar{X}_5$	$\bar{X}_6$	$\bar{X}_7$	$\bar{X}_8$
white students with white male instructors $\bar{X}_1 = 26.4$		2.2	2.5	1.4	**15.2**	8.7	0.5	1.9
white students with white female instructors $\bar{X}_2 = 24.2$			**4.7	**3.6	**17.2**	10.9	2.7	0.3
white students with black male instructors $\bar{X}_3 = 28.9$				1.1	**12.7**	6.2	2.0	**4.4
white students with black female instructors $\bar{X}_4 = 27.8$					**13.8**	7.3	0.9	**3.3
black students with white male instructors $\bar{X}_5 = 41.6$						**6.5**	14.7	**17.1
black students with white female instructors $\bar{X}_6 = 35.1$							**10.2**	10.6
black students with black male instructors $\bar{X}_7 = 26.9$								2.4
black students with black female instructors $\bar{X}_8 = 24.5$								

\*\*Significant differences at  $p < .01$ .

Table F.8

Differences in Mean Distances for Interaction  
of Race of Student by Sex of Student by Race of Instructor by Sex of Instructor

	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_4$	$\bar{X}_5$	$\bar{X}_6$	$\bar{X}_7$	$\bar{X}_8$	$\bar{X}_9$	$\bar{X}_{10}$	$\bar{X}_{11}$	$\bar{X}_{12}$	$\bar{X}_{13}$	$\bar{X}_{14}$	$\bar{X}_{15}$	$\bar{X}_{16}$
$\bar{X}_1$ = white male student w/ white male instructor = 27.9		3.0 **	14.1 **	13.3 **	4.4	1.1	3.2 **	10.5	1.1	3.0	1.2	3.1	1.3	1.1 **	6.9	0.2
$\bar{X}_2$ = white female student w/ white male instructor = 24.9			** 17.1 **	16.3	1.4	1.9	0.2 **	7.5	1.9	0.0	1.8	0.1	1.7	1.9 **	3.9	2.8
$\bar{X}_3$ = black male student w/ white male instructor = 42.0				0.8 **	18.5 **	15.2 **	10.3 **	3.6 **	15.2 **	11.1 **	12.9 **	17.2 **	15.4 **	13.0 **	21.0 **	13.9
$\bar{X}_4$ = black female student w/ white male instructor = 41.2				** 17.7 **	14.4 **	9.5	2.8 **	14.4 **	10.3 **	12.1 **	17.2 **	14.6 **	12.2 **	20.2 **	14.1	
$\bar{X}_5$ = white male student w/ white female instructor = 23.5						3.3 **	8.2 **	14.9	3.3 **	7.4 **	5.6	1.3	3.1	** 5.5	2.5	** 4.6
$\bar{X}_6$ = white female student w/ white female instructor = 26.8							** 4.9 **	11.6	0.0 **	4.1	2.3	2.0	0.2	2.2 **	5.8	1.3
$\bar{X}_7$ = black male student w/ white female instructor = 31.7							** 6.7 **	4.9	0.8	2.6	** 6.9 **	5.1	2.7	** 10.7 *	3.6	
$\bar{X}_8$ = black female student w/ white female instructor = 38.4								** 12.6 **	7.5	** 9.3 **	13.6	** 11.8	** 9.4 **	17.4 **	10.3	
$\bar{X}_9$ = white male student w/ black male instructor = 26.8									** 4.1	2.3	2.0	0.2	2.2	** 5.8	1.3	
$\bar{X}_{10}$ = white female student w/ black male instructor = 30.9											1.8 **	6.1 **	4.3	1.9 **	9.9	2.8
$\bar{X}_{11}$ = black male student w/ black male instructor = 29.1											** 4.3	2.5	0.1	** 8.1	1.0	

Table F.8 (continued)

Differences in Mean Distances for Interaction  
of Race of Student by Sex of Student by Race of Instructor by Sex of Instructor

	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_4$	$\bar{X}_5$	$\bar{X}_6$	$\bar{X}_7$	$\bar{X}_8$	$\bar{X}_9$	$\bar{X}_{10}$	$\bar{X}_{11}$	$\bar{X}_{12}$	$\bar{X}_{13}$	$\bar{X}_{14}$	$\bar{X}_{15}$	$\bar{X}_{16}$
$\bar{X}_{12}$ = black female student w/ black male instructor = 24.8													1.8	**4.2	**3.8	3.3
$\bar{X}_{13}$ = white male student w/ black female instructor = 26.6														2.4	**5.6	1.3
$\bar{X}_{14}$ = white female student w/ black female instructor = 29.0															**8.0	0.0
$\bar{X}_{15}$ = black male student w/ black female instructor = 21.0																**7.1
$\bar{X}_{16}$ = black female student w/ black female instructor = 28.1																

\*\*Significant differences at  $p < .01$ .

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