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A SIMULATION METHODOLOGY FOR PROXEMIC RESEARCH

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Abstract. In this paper we report the findings of an investigation designed to test whether a projection technique could approximate proxemic preferences by individuals found in previous research using actual observations. We also examined apprehension about oral communication, a personality-type variable, to see if it would affect the spacing preference of the subjects. Our findings indicate that the projection technique developed was able to yield preference data similar to those found in direct observation of spacing. Apprehension about oral communication appears to affect the spacing preferences for males but not for females.

Problem. The distance we place between ourselves and others when communicating has in recent years become a major research interest. This distance has been variably labeled: personal space (Little 1965), immediacy (Mehrabian 1967), and proxemics (Hall 1963). Personal space has been defined (Aiello 1974: 177) as "the distance that an organism usually keeps between itself and other organisms." Hall (1963) has further provided a zonal distinction, which suggests that human beings have an intimate space of 0-18 inches, a personal space of 18-48 inches, a social-consul-

tative space of 48-144 inches, and a public space of 144 inches to the limits of visibility. These zonal distinctions, although Hall cautions against generalizing them to varied populations, have generally been accepted as representing North American space norms (Knapp 1972, Harrison 1974, Leathers 1976).

How individual persons differing in various characteristics use their space zones has accounted for the majority of research to date. In discussing Hall's space zones, Little (1965) has suggested that they are "a series of fluctuating concentric globes of space, each defining a region for certain types of interaction" (p. 238). Several variables have been suggested as mediating our use of space. These include: sex, race, superior-subordinate relations, familiarity, degree of friendship, status, interaction setting, topic of interaction, physical appearance, and desire for approval (cf Knapp 1972).

While the research to date has generally been supportive of the idea of space differences, the exact nature of such differences is not clear. Aiello and Cooper (1972) suggest that the nature of the measurement involved is a crucial issue. There have been two primary techniques employed in measurement: observation and notation systems involving actual physical measurement of persons interacting, and projective techniques. Both these methods have advantages and disadvantages.

Possibly the most complex observation-notation system developed to date is that of Hall (1963) as modified by Aiello and Cooper (1972). This system utilizes eight categories for coding purposes. These are, sociofugal-sociopetal axis, postural sex identifiers, kinesthetic factors, visual factors, thermal factors, olfactory codes, voice loudness, and touching. While this is a comprehensive enough system, ironically its comprehensiveness limits its usefulness. Researchers have found it necessary to modify or restrict the number of categories actually used (Aiello 1972, Watson & Graves 1966). A major advantage of this and similar systems is that they allow for observation without obtrusion. As Aiello and Cooper point out, "...if measured unobtrusively, they provide rich information about...the process of interaction" (1972: 207).

The second method of measuring differential space preferences involves the use of projection techniques. These are

usually methods of simulation in which subjects are asked to place some kind of figure (e.g. a doll, model, etc.) on some flat surface. Then the investigator makes comparisons among placements under varying stimulus conditions. Several criticisms can be levied against projection techniques. Probably the most crucial is the question of validity. Aiello and Aiello noted this concern—"...the relationship between projected and actual distance is at present only assumed and has not yet been established" (1974: 179).

The primary purpose of this study was to test the assumption that projected distance preferences are related to actual distances of subject choices. To test this assumption, a projection was developed in which the simulated interaction distance was measured in millimeters, using a scale of one millimeter equal to 1.44 inches. In the test of validity of our projection technique, we used three of Hall's zonal categories: intimate, personal, and social-consultative space. Six types of interpersonal relationships were used as projection stimuli. These are three variables that have been shown to affect space preference: sex, the nature of the relationship, and positive or negative affect. The specific stimulus inductions and our a priori predictions are summarized in Table 1.

Stimulus Induction	Predicted Zone
Best Friend, Opposite Sex	Intimate
Female	Intimate
Best Friend, Same Sex,	Personal
Male	Personal
New Person, Opposite Sex	Personal
Male	Personal
New Person, Same Sex,	Personal
Female	Personal
Teacher Liked	Personal
Teacher Disliked	Social-Consult.

TABLE 1.

Personality type and the nature of the space relationship has also been investigated; but unlike the other variables, for these the relationship is much less clear. In this study we selected one variable of personality type, apprehension about oral communication, and tested to see whether our projection technique could locate within each zone distances associated with apprehension differences. In recent years, this variable has received increasing attention from communication research. Oral communication apprehension (CA) has been defined as an individual's level of fear or anxiety associated with either real or anticipated communication with another person or persons (McCroskey 1976). Research on CA has shown a consistent behavior pattern of persons with high CA, one that involves avoidance and withdrawal from communication encounters (McCroskey 1976).

The two research questions posed for the present study are:

1. Can a projection technique generate data relating to interpersonal spacing preferences consistent with the results of previous research that used direct observational procedures?
2. Can a projection technique isolate differences in interpersonal spacing preferences that can be attributed to differential levels of communication apprehension?

Method. Preferences for interpersonal distance were measured with a simulated interaction procedure. Three hundred and sixteen students were presented a diagram of a room described as 15 feet by 18 feet, but drawn to scale so that one millimeter on the floor plan represented 1.44 actual inches (See Figure 1, page 366). Within that room, in the lower right-hand corner was a dot. The subjects were instructed as follows: "Presume you are to enter the room represented by the box below to talk with (person varied—see below). The dot in the box represents where (the person previously identified) is sitting. Please place a dot in the box where you would prefer to sit to talk with this person."

Since previous research (cf Knapp 1972) has indicated that sex, the nature of the relationship, and positive or negative affect have an impact on interpersonal distance preferences,

each subject was asked to repeat the procedure for six target persons (order determined randomly for each S). The six targets were: best friend, opposite sex; best friend, same sex; a person of the same age but opposite sex not met previously; a person of the same age and sex not met previously; the teacher that "you most like"; and the teacher that "you like least."

Prior to further analysis, the obtained mean distances for each stimulus induction were transformed to inches, so the obtained differences could be compared to previously suggested norms in order to check the validity of the simulated interaction procedure employed. On a priori grounds, considering previous research (e.g. Leathers 1976: 50), it was predicted that the two best-friend, opposite-sex stimulus inductions were operationalizations of intimate relationships, thus: The best friend same sex (female) an operationalization of intimate space; the best friend same sex (male), of personal space; the new person in both sex relationships, operationalizations of personal space; the teacher liked, personal space; and the teacher disliked, social-consultative space.

Communication apprehension. The 316 subjects in this study also completed the Personal Report of Communication Apprehension (PRCA, McCroskey 1970) to determine their level of CA. Those subjects who scored beyond one standard deviation from the mean were classified as "high communication apprehensives" (N, 55), and those that scored one standard deviation below the mean were classified as "low apprehensives" (N, 42). The estimated internal reliability (split-halves) of the PRCA was 0.92. The analysis of this data involved the computation of a series of two-way analyses of variance with the obtained distance preferences for the six target inductions serving as dependent variables. The independent variables in these analyses were, sex of subject, male and female, and CA level for each subject. The alpha level was set at 0.05.

Results. The results obtained from our projection technique indicate that all predicted space preferences were obtained (see Table 2). For best friend, opposite sex, the mean distance for males was 12.7 inches, and for females 11.2 inches. Both of these fall in the predicted intimate zone. These findings

Stimulus Induction	Zone	Range Expected	Mean Distance (inches)	
			Males	Females
Best Friend				
Opposite Sex	Intimate	0-18	12.7	11.2
Best Friend F	Intimate	0-18		15.3
Same Sex	M Personal	18-48	26.5	
New Person				
Opposite Sex	Personal	18-48	27.9	34.2
New Person				
Same Sex	Personal	18-48	40.5	30.3
Teacher				
Liked	Personal	18-48	27.3	22.4
Teacher	Social-			
Disliked	Consult.	48-120	65.3	58.4

Table 2. Expected and observed interpersonal distance preferences, expressed in inches.

support previous research indicating that females prefer closer distances than do males (Aiello & Aiello 1974). For best friend same sex female, the observed distance was 15.3 inches. While this preference is in the intimate zone, it lies within the "not close" range of intimate space reported by Hall (1968). For best friend same sex male, the obtained mean distance was 26.5 inches, placing it as predicted within the personal zone. This finding too is consistent with other research that has used observation techniques (Aiello & Cooper 1972, Aiello & Aiello 1974). For the new person opposite sex male, the mean distance obtained on our projection diagram and converted to inches was 27.9 inches; for new person opposite sex, female subject, the distance was 34.2 inches. Both of these distances fall within the personal zone as predicted; however, there was an interesting reversal in this finding. Although most research suggests that females prefer closer distances than males, it was

not found in this situation. A similar finding to ours was reported by Willis (1966): He found that females stood closer to "close friends" but farther away from "just friends" than do males. Willis reasons that this may be to a more cautious approach by females when making friends. Our finding coupled with that of Willis suggests that this relationship warrants further investigation.

For the new person same sex, the observed male distance was 40.5 inches, the female subject distance was 30.3 inches. These distances fall within the predicted personal zone and are consistent with previous research that indicates closer space preference by females. For the teacher-liked condition, the observed distance was, males 27.3, females 22.4. These also fall within the personal zone as predicted. Again sex difference in preference was observed. For the teacher-disliked condition, the obtained distance for females was 58.4 inches and for males 65.3 inches, within the social-consultative zone as predicted; and again the sex preference was observed.

On the basis of these findings it appears that our first research question, "Can a projection technique generate data relating to interpersonal spacing consistent with the results of previous research using direct observation?" can be answered unequivocally in the affirmative.

Communication apprehension and distance preference. Significant interaction effects ($p < .05$) were obtained for both best-friend targets, both teacher targets, and new person of the same sex target. For the new person of the opposite sex target, significant effects were observed for sex of subject ($F = 9.34$, $p < .05$). Females ($\bar{X} = 36.9$ inches) preferred greater distances than did males ($\bar{X} = 25.5$). Apprehension effects approached significance ($F = 3.57$), but did not meet the established significance criterion. High apprehensives yielded a mean preference of 30.0 inches, while the low apprehensives' preference was 32.3.

Because of the obtained significant interactions on the remaining targets, differences among means were probed with the Sheffe procedure. The obtained means, converted to inches, for the various targets and conditions are reported in Table 3.

CA Rating	Friend Opp. Sex	Friend Same Sex	Stranger Same Sex	Teacher	
				Liked	Disliked
M, High	10.9 ¹	19.0 ¹	34.8 ¹	16.6 ^{1 2}	76.8 ^{1 2}
M, Low	16.4 ^{1 2}	28.4 ^{1 2}	42.8 ^{1 2}	25.3 ¹	47.2 ^{1 3}
F, High	11.0 ²	14.4 ²	32.5 ²	25.9 ²	60.9 ^{2 3}
F, Low	9.8 ²	14.7 ²	29.4 ²	19.6	59.0 ^{2 3}

Table 3. Mean distance preference in inches, by Apprehension level, Target, and Sex.

Key: ¹ means for same sex, same col. are signif. diff., $p < .05$
² means opp. sex, same col. are signif. different, $p < .05$
³ (same as ²)

As noted in Table 3, in every case the male high apprehensives and the male low apprehensives differed significantly in their interpersonal distance preferences. None of the comparisons between female high apprehensives and female low apprehensives, however, differed significantly. For three targets—both best friend targets, and the new persons same sex target—the male low apprehensives preferred greater distances than did the females in either of the two CA conditions. For the teacher most liked, the male high apprehensive preferred a significantly smaller distance than did the female high apprehensive. Finally, for the teacher least liked, the high apprehensive males preferred a significantly larger distance than did females in either CA condition, and the low apprehensive males preferred a significantly smaller distance than did either CA condition females.

Discussion. It is clear from the results of this study that our projection technique was able to approximate closely the interpersonal distance preferences observed in naturalistic environments by other researchers (Hall 1963, Aiello 1974).

The method is made even more viable by its ability to detect predicted zone categories under differing stimulus inductions. The validity of this projection technique appears to be strong. Because it was able to detect zones as well as sex differences within those zones, this tool appears to be extremely valuable to those who investigate interpersonal space.

Further, it is clear that an answer to our research question concerning interpersonal distances of high CA and low CA individuals must take into account the sex of the individual and the degree of positive affect felt toward the target person. Interpretation of the results for female subjects is relatively unambiguous, since no significant difference between apprehension conditions was observed for any target person. Apparently, a female subject's level of CA does not mediate her preference for interpersonal distance, at least as measured by our projection technique.

For males, on the other hand, CA level appears to be a mediating variable. For people who are liked or are new to the subject, high CA males prefer interpersonal distances about six to nine inches closer than those preferred by low CA males. The reverse pattern exists when the target person is disliked. In fact, high apprehensives indicated a preference almost two and one-half feet more distant than did low apprehensives, for the disliked teacher target.

It appears then that our projection technique can not only predict the North American space norms and sexual preference within those norms, but can detect also personality differences in the use of space. Of course whether the personality differences observed actually exist in interpersonal encounters is yet to be verified through actual physical observation.

On this basis, therefore, we believe the projection technique described here can be expected to generate valid indications of preferences for space in personal interaction. We recommend its use, particularly during exploratory phases of proxemic research. There is reason to believe that it will provide not only a valid but also a convenient and inexpensive method of obtaining proxemic data prior to the point in a research program at which field observation is necessary.

Presume you are to enter the room represented by the box below to talk with _____. The dot in the box represents where _____ is sitting. Please place a dot in the box to indicate where you would prefer to sit to talk with _____.

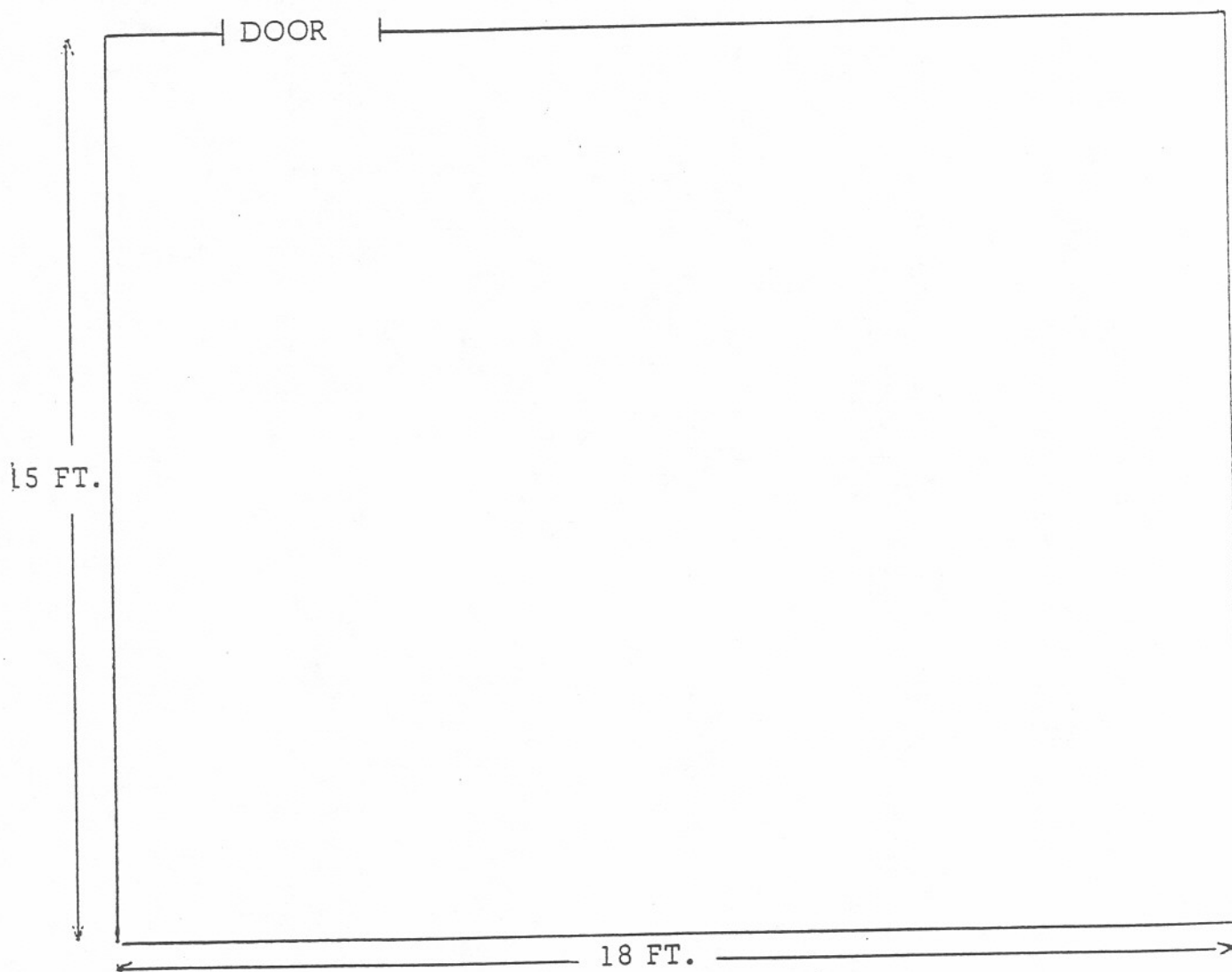


TABLE 1. The measuring instrument.

(Reduced in reproduction; actual size 125mm by 150 mm)

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