A Test of the Validity of Projective and Quasi-Projective Measures of Interpersonal Distance

STANLEY E. JONES
JOHN R. AIELLO*

Much of the interest in personal space phenomena was inspired by the writings of Edward Hall, beginning with his classic book, *The Silent Language*,[1] but many other authors have contributed ideas and research findings. As early as 1969, Lett, Clark, and Altman generated a bibliography of over 500 articles which were in some way related to the topic.[2] Recently, Altman and Vinsel reviewed over 200 studies specifically concerned with interpersonal distance,[3] and Aiello and Thompson extended this number to 400 studies.[4]

While some investigators followed Hall's lead by recording actual interaction behavior,[5] others employed less direct methods which call on subjects to identify their "typical" spatial behaviors. The purpose of the present investigation was to test the validity of such "self-report" methods. At present, studies employing these measures constitute about one half of the research literature on interpersonal distance.[6]

Measures of distance phenomena may be classified into three types: projective, quasi-projective, and interactional. The first two are self-report measures and the third is observational. *Projective* methods involve asking subjects to *imagine* some interaction situation and to project how they

---

*Mr. Jones is Associate Professor in the Department of Communication, University of Colorado, Boulder. Mr. Aiello is Associate Professor in the Department of Psychology, Rutgers University.

[1] Edward T. Hall, *The Silent Language* (Greenwich, Conn.: Fawcett Publications, Inc., 1959).

[2] E. Lett, W. Clark, and Irwin Altman, "A Propositional Inventory of Research on Interpersonal Distance," Naval Medical Research Institute, Research Report, 1969.

[3] Irwin Altman and A. Vinsel, "Personal Space: An Analysis of E. T. Hall's Proxemics Framework," in *Human Behavior and Environment*, II, ed. Irwin Altman and J. F. Wohwill (New York: Plenum Press, 1977).

[4] John R. Aiello and Donna E. Thompson, "Personal Space, Crowding, and Spatial Behavior in a Cultural Context" in *Human Behavior and Environment*, IV, ed. Irwin Altman, J. F. Wohwill and Anatol Rapoport (New York: Plenum Press, 1979).

[5] Edward T. Hall, "A System for the Notation of Proxemic Behavior," *American Anthropologist*, 65 (1963), 1003-1026.

[6] Altman and Vinsel.

would behave. Specific techniques may require subjects to do various kinds of tasks, including placing silhouettes on a felt board, making marks on a diagram to indicate preferred distances from others, arranging dolls, mannequins, or live people in relation to one another, or choosing among seating or standing positions represented in photographs or video recordings. Distances are measured directly, usually by means of a ruler or measuring tape.

Quasi-projective methods require subjects to use their own bodies as projective objects in relation to an imagined or real person. That is, subjects are instructed to behave "as if" they are involved in an authentic interaction, while in fact the situation is highly contrived. Typically, the subject is asked to approach a confederate and to stop at a "comfortable" distance. The technique is sometimes reversed, so that the confederate approaches and the subject signals when the confederate should stop. In some studies, subjects imagine another person represented by a coat rack, a chair, or some other object. Measurements are ordinarily made by some direct means such as reading markings placed on the floor to indicate units of spatial distance.

Interactional measures involve the direct observation of conversational behavior. Subjects may be induced to engage in conversations, or they may be observed in naturalistic settings, and measurements are ordinarily taken in an unobtrusive fashion. Typically, observers are trained in advance to make judgements about distance relationships without the aid of physical measurement devices, although in some cases tiles on the floor or other rather direct means of calibration are utilized.

Obviously, there are certain practical advantages to the use of projective and quasi-projective measures, and these may account for their popularity. Both types of self-report techniques allow the direct measurement of distances, and thus do not require extensive training for observers. Projective measures require only a few minutes to administer to each subject, and quasi-projective methods usually take only a little longer. Virtually any room can be employed as the experimental setting, and projective measures can be administered to groups as well as to individuals.

At the same time, it seems intuitively obvious that interaction observations are superior to self-report methods in terms of face validity since they constitute more direct measures of the phenomenon of interest. With the notable exception of Kuethe,[7] those investigators who employ self-report techniques *believe* that they are measuring interaction tendencies. As Miesels and Guardo put it, "space schemata are assumed to exist *a priori* in structured form, and the schemata are considered to be isomorphic with the patterning of actual interaction distances."[8] Thus, the

[7] James L. Kuethe, "Social Schemas," *Journal of Abnormal and Social Psychology,* 64 (1962), 31-38.

[8] Murray Meisels and Carol Guardo, "Development of Personal Space Schemata," *Child Development,* 40 (1969), 1168.

question may be asked, "Do scores of projective and quasi-projective measures correlate with the outcomes of interaction measures?"

For the most part, previous investigations suggest that various self-report methods tend to measure related phenomena, although, as Duke and Nowicki note, this relationship is sometimes weak.[9] In an early study, Little examined the relationship between two types of projective measures, placement of cardboard figures and of live actors, and obtained a correlation of .77.[10] Subsequent investigations generally report positive but somewhat lower correlations than those found by Little, both within and between various projective and quasi-projective measures.[11] For example, Rawls, Trego, and McGaffey found correlations ranging from .34 to .91 among a battery of measures which included a staged approach to another individual (a quasi-projective measure) and various projective techniques.[12] Duke and Nowicki report the most consistently positive relationships between a projective measure (their Comfortable Interpersonal Distance Scale) and quasi-projective measures. Correlations in two studies ranged from .65 to .84.[13]

Evidence for relationships between self-report and interaction measures is weaker than that found among self-report measures. Dosey and Meisels conducted a study in which subjects approached members of the same and opposite sex (a quasi-projective measure), placed a silhouette representing the self in relation to one of the opposite sex (a projective measure), and selected either a close or far seat from an interviewer (an interaction measure). Of four correlations between silhouette placement and seating, three were negative, one at a statistically significant level. Among 12 correlations of approach and seating responses, all were positive, but only one was statistically significant.[14]

Knowles and Johnson reported three statistically significant but low positive correlations (.22, .27, and .31) among fourteen comparisons involving two interaction measures (disguised approach distance and disguised seating distance) and seven projective and quasi-projective

9 Marshall P. Duke and Stephen Nowicki, "A New Measure and Social-Learning Model for Interpersonal Distance," *Journal of Experimental Research in Personality*, 6 (1972), 122.

10 Kenneth B. Little, "Personal Space," *Journal of Experimental Social Psychology*, 1 (1965), 237-247.

11 See Michael Dosey and Murray Meisels, "Personal Space and Self Protection," *Journal of Personality and Social Psychology*, 11 (1969), 93-97; Duke and Norwicki; Richard F. Haase and Martin J. Markey, "A Methodological Note on the Study of Personal Space," *Journal of Consulting and Clinical Psychology*, 40 (1973), 122-125; Eric S. Knowles and Per K. Johnsen, "Interpersonal Consistency in Interpersonal Distance," *Journal Supplement Abstract Service*, 4 (1974); Darhl M. Pedersen, "Developmental Trends in Personal Space," *Journal of Psychology*, 83 (1973), 3-9; and J. Rawls, R. Trego, and C. McGaffey, "A Comparison of Personal Space Measures and Correlates of Personal Space," Institute of Behavioral Research, Texas Christian University, 1968, NASA Grant Report.

12 Rawls, Trego, and McGaffey.

13 Duke and Nowicki.

14 Dosey and Meisels.

measures.[15]

Cronje and Moller compared *in vivo* participation (an interaction measure which involved having the subject pull up a chair to a desk), photographic observation (a projective measure in which subjects stated preferences for seating positions represented in photographs), and a model technique (a projective measure in which the subjects arranged miniature furniture in a scale model of the room used for the *in vivo* observation). The results showed that photographic observation was slightly inferior to the model technique in predicting *in vivo* participation, and that these latter two measures were related at a statistically significant level.[16]   However, the model technique required subjects to replicate their earlier *in vivo* participation. In addition, the relationship between the photographic and model results were much stronger than that of the model and *in vivo* measures.

Finally, as part of a study of individual differences in response to crowding, Aiello, DeRisi, Epstein, and Karlin collected data on three techniques of assessing personal space preferences: (a) interpersonal distance maintained with a confederate (an interaction measure); (b) videotape ratings of seating preferences; and (c) the Duke and Nowicki Comfortable Interpersonal Distance Scale[17]   (a paper-and-pencil projective measure). The results suggested that the two projective measures were unrelated to the actual seating distances chosen by subjects.[18]

In sum, the findings of past research provide little confidence in the validity of self-report methods as indicators of actual interaction distances. However, because previous investigations contained features which limit their generalizability, the present study was designed to further test the hypothesis that self-report measures are related to interaction behaviors:

(1) In those studies where positive correlations were obtained, a battery of tests were given to subjects within a single experimental session, thus implicitly inviting subjects to be consistent from measure to measure. This is especially true of the Knowles and Johnsen study, which involved a sequence of nine consecutive measures,[19]   but the criticism also applies to the Cronje and Moller study where three measures were administered in series.[20]   In addition, as already noted, subjects in the latter study may have been implicitly encouraged to replicate their *in vivo* behavior by the use of a scale model of the environment in which the actual interaction took place.

[15] Knowles and Johnson.

[16] F. J. Cronje and A. T. Moller, "Comparison of Different Procedures to Assess Personal Space," *Perceptual and Motor Skills*, 43 (1976), 959-962.

[17] Duke and Nowicki.

[18] John R. Aiello, Donna T. DeRisi, Yakov M. Epstein, and Robert A. Karlin, "Crowding and the Role of Interpersonal Distance Preference," *Sociometry*, 40 (1977), 271-282.

[19] Knowles and Johnsen.

[20] Cronje and Moller.

In the present study, each subject was observed twice, once while engaging in interaction, and later during the same session while participating in either a projective or a quasi-projective activity. Thus, the chances for artifactual replication of responses across measures were reduced.

(2) The validity of the interaction measures employed in previous studies may be questioned. For the most part, these measures involved a "one shot" observation of distance behavior. An exception is the Aiello et al. study,[21] in which three measures of interaction behavior were combined (initial, closest, and farthest distance from a confederate).

The effect of an unreliable (and therefore invalid) measure of interaction behavior would be to underestimate the relationship of interaction behavior to self-report measures, if it is assumed that a positive relationship actually exists. The present investigation counteracted this difficulty by measuring interaction behavior at a series of intervals during a conversation lasting several minutes.

(3) A third weakness of the previous research is that self-report measures were employed with the use of a confederate (in the case of quasi-projective methods) or a hypothetical person of the same or opposite sex (in projective measures). This neglects an important element included in interaction situations: the specific relationship of the subject and the person with whom he or she interacts. This would tend to depress correlations between self-report and interaction measures. In the present study, the person with whom the subject was paired for the interactional observation also served as the stimulus for the projective and quasi-projective measures.

(4) Finally, previous studies were conducted with rather homogeneous populations in terms of cultural and socioeconomic backgrounds. The data of the present investigation were collected as part of a study of differences in proxemic behavior among middle- and working-class black and white subjects. Thus, it was possible to explore not only over-all correlations between self-report and interaction measures, but also variations among cultural and economic class groups. It is feasible that measures which are valid for some groups are not valid for others.

METHOD

Subjects. The subjects were 212 tenth grade students from six New York City high schools characterized by a high degree of racial and socioeconomic class homogeneity. The composition of the sample was as follows: white working-class (n = 70); white middle-class (n = 52); black working-class (n = 36); black middle-class (n = 54). Male and female

---

[21] Aiello, DeRisi, Epstein, and Karlin.

subjects were approximately equally represented in each of these four populations. The unit of analysis for this investigation was the dyad; therefore the total n was 106.

Procedure. The composition of the dyads was determined by asking teachers to pair males with males and females with females who they felt were neutral to friendly about each other. At the beginning of a class period an experimenter entered each room and explained that the students were going to engage in a communication activity in pairs. In random order, pairs were taken one at a time to another part of the school building where two adjoining classrooms had been reserved. All classrooms were identical in physical dimensions and nearly identical in appearance. One room in each school was used to record interaction behavior; the other was used to record the projective and quasi-projective responses.

For the interaction measure, the subjects were introduced to a male or female college student sitting behind a desk. These students, who dressed in a manner similar to the younger teachers in the schools, served as *administrators of the experiment and as judges, and gave the following* instructions:[22]

> We're here to do a survey. We'd like to find out what your favorite TV programs are. We'd also like to know what programs you feel are best directed and which have the best special effects. Decide between yourselves what programs are the best.

The judge said that he or she would be busy for several minutes and would ask them for their ideas shortly. The judge asked the subjects to talk "over there," pointing to an area about 10-12 feet from the desk, and then simulated the activity of grading papers while the subjects talked. The judge looked up to record behavior at selected intervals — 30 seconds after talk began, and at consecutive 20 second intervals until a sample of six instances of behavior had been collected. At the end of this period of time, subjects were asked to approach the desk to report their ideas, and then were asked to "go back" and try to agree on the best single program. Distance behavior was recorded an additional time when the subjects started talking.

The interaction measure employed during this phase of the study was based on Hall's notation system for proxemic behavior[23] as adapted by Jones and Aiello[24] and revised by Aiello and Aiello.[25] This scale requires

[22] Stanley E. Jones and John R. Aiello, "Proxemic Behavior of Black and White First-, Third-, and Fifth-Grade Children," *Journal of Personality and Social Psychology* 25 (1973), 21-27.

[23] Hall, 1963.

[24] Jones and Aiello.

[25] John R. Aiello and Tyra D. Aiello, "The Development of Personal Space: Proxemic Behavior of Children 6 Through 16," *Human Ecology*, 2 (1974), 177-189.

judges to make recordings in terms of portions of arm lengths rather than in inches.[26] The training of judges was similar to that employed by Jones and Aiello. Although only one judge was employed to observe any particular pair in the present study, inter-judge reliability of the five observers determined prior to the study was .97.[27]

After the interaction observation phase, the judge took each dyad to the other experimental room, and randomly assigned them to either a quasi-projective or a projective measurement exercise. A second experimenter introduced the exercise by saying, "The next activity is a placing game."

In the quasi-projective activity, subject B stood still while subject A approached along a tape marked in 3-inch intervals and stopped at a "comfortable" distance. Measures were recorded to the nearest 3 inches by the experimenter at the point where the forward foot rested when the subject stopped his or her forward motion. In this approach, both subjects were instructed to maintain constant eye-contact with one another (the EC condition). For the next condition both subjects were instructed to avoid eye-contact (the NO EC condition) and subject A approached subject B. Finally, the procedure was reversed, so that subject B approached subject A, first in the EC condition and then in the NO EC condition.[28]

In the projective activity, each subject was instructed to place a felt silhouette figure representing the self in relation to a silhouette representing another person on a felt board. Felt figures were scaled one inch to one foot. This procedure was similar to that employed by Guardo.[29] In a series of placements, subjects were asked to imagine the silhouette representing the other person as (a) a stranger, (b) their best friend, (c) the subject's partner in the previous "survey" activity, (d) an acquaintance, and (e) an enemy. Imbedding the "partner" condition in a series of judgements was designed to disguise the purpose of the study. After the first member of a dyad completed these placements, the second member was called into the room to make his or her designations.

When all measures were completed, each dyad was asked not to discuss the experiment with the other members of the class and was accompanied back to the classroom.

---

26 It should be noted that the units in this scale are approximately equal to 5½ inch units with the subjects employed in this study. The units differ in absolute value as measured in inches when there are extreme height differences from one pair of subjects to another. The scale is especially appropriate for developmental studies of children where heights and reaches may vary considerably among age levels.

27 Cf. Jones and Aiello.

28 The EC and NO EC conditions were employed in the present study on the assumption that eye-contact might be a significant element in the selection of distances. This seemed especially important in the present study because of racial differences since blacks have been observed to maintain less eye-contact than whites. See Gerald D. Suttles, *The Social Order of the Slum* (Chicago: University of Chicago Press, 1968), 66-67.

29 Carol Guardo, "Personal Space in Children," *Child Development*, 40 (1969), 143-151.

RESULTS

Pearson's Product-Moment Coefficient of Correlation was used as the basis for assessing associations between measures. Four indices of interaction behavior were compared with two quasi-projective scores and one projective score. The indices of interaction behavior were as follows: (a) *early* distance (the first judgement after 30 seconds of conversation); (b) *closing* distance (the last judgement before subjects were asked to conclude the conversation); (c) *go back* distance (the judgement made when subjects were asked to go back and select the best single program); and (d) *average* distance (the average of the six scores recorded between "early" and "closing" distances). The purpose of using multiple interaction indices was to test for the possibility that some types of interaction scores might be more highly correlated with projective or quasi-projective measures than others.[30]

Two quasi-projective scores were employed for comparison: the average of the two partners' approach distances in the EC (eye-contact) condition and in the NO EC (no eye-contact) condition. One projective score, an average of the felt figure placements for the members of each pair in the "partner" condition, was correlated with the interaction scores.

The over-all correlations (all pairs combined) are presented in Table One. The correlations hover around zero. The -.283 correlation of the early interaction score with the projective score is the only one which approaches statistical significance at the .05 level.

TABLE 1
OVER-ALL CORRELATIONS
SELF-REPORT AND INTERACTION MEASURES

Self-Report *Measures*	Interaction Measures			
	Early	*Closing*	*Go Back*	*Average*
EC Quasi-Projective (df = 60)	+ .028	-.174	-.056	-.023
NO EC Quasi-Projective (df = 60)	+ .032	+ .017	+ .035	+ .080
Projective (df = 42)	-.283*	+ .104	-.174	-.039

*.10> p >.05.

[30] These four scores were redundant to some degree. The "early," "closing," and "go back" scores were all positively and significantly correlated (p < .01) with the "average" score (.67, .82, and .66, respectively).

To determine if the self-report measures were more valid for one sex than the other, correlations for males combined and females combined were calculated separately. The pattern of results is similar to that found in the over-all correlations. One of these correlations, $r = -.431$, for "go back" interaction and the projective measure among males, approached statistical significance at the .05 alpha level.

To determine if the self-report measures might be more valid for some groups than others, correlations were calculated separately for each socioeconomic/racial group (working-class whites, middle-class whites, working-class blacks, and middle-class blacks). Only the correlation of early interaction and the projective measure among working-class whites was statistically significant ($r = -.619$, n = 14, p < .02).

DISCUSSION

The data indicate that the projective and quasi-projective measures used in this study do not reflect actual interaction behavior. If anything was demonstrated, it is that the projective measure tended to be *negatively* associated with certain interaction measures. While the failure to reject a null hypothesis cannot be taken in itself as proof that no relationship exists, the repeated lack of significant findings across a number of correlations is highly suggestive. When these results are considered in light of several previous studies with similar findings, it seems reasonable to conclude that there is no substantial evidence for the validity of self-report measures of personal space.

However, there is reason to believe that self-report techniques do measure *something* with a degree of consistency. In the first place, there is some evidence that a number of positive associations exist both within and between various projective and quasi-projective measures. Secondly, a great many published studies employing self-report measures have produced statistically significant differences among experimental conditions, and a number of these findings have been replicated.[31]

Despite this evidence, it is difficult to say exactly what projective and quasi-projective tests measure. It is possible that they are more indicative of *psychological* than physical distance. At present, there is evidence that scores on self-report measures are positively associated with degree of acquaintance[32] and positive affect.[33] Also, a positive association between closer interaction distances and psychological closeness has been demonstrated.[34] It remains to be shown which types of measures are more

---

[31] See Altman and Vinsel.

[32] Little.

[33] Albert Mehrabian, "Relationship of Attitudes to Seated Posture, Orientation, and Distance," *Journal of Personality and Social Psychology* 10 (1968), 26-30.

[34] See John R. Aiello and Ralph E. Cooper, "The Use of Personal Space as a Function of Social Affect," *Proceedings of the 80th American Psychological Association Annual Convention*, 1972, 207-208; Edward Gotthiel, Jeffrey Corey, and Alfonso Parades, "Psychological and Physical Dimensions of Space," *Journal of Psychology*, 69 (1968), 709.

closely related to psychological distance.

Another possibility is that self-report measures reflect a weighted average of a number of proxemic behaviors, including not only distance, but also such factors as degree of body directness and eye-contact. This explanation would be consistent with Argyle and Dean's "equilibrium hypothesis" which proposes that the degree of intimacy expressed in conversations is regulated by the counter-balancing of such behaviors. For example, closer distances tend to be associated with less eye-contact and farther distances with more eye-contact.[35]

A third explanation might be that projective and quasi-projective measures represent an average interaction distance across a number of contexts, whereas interaction measures are always taken within a specific context. It might be argued, therefore, that they would not correlate highly. However, an unpublished follow-up study to the present investigation by Love and Aiello provided evidence which casts doubt on this explanation. They specifically asked subjects to replicate their interaction behavior using three different self-report measures, and found that they were unable to do this successfully.[36] Their results suggest that even when the context for projective and quasi-projective measures is specified to be the same context as that for actual interactions, the self-report and interaction measures do not seem to be related.

Interpretation of past studies using projective and quasi-projective methods seems highly problematic until more is known about what they measure. In the meantime, for investigators concerned with interpersonal distance *per se*, two research directions may be suggested: (1) investigators may choose to search further for projective and quasi-projective measures which do correlate strongly with interaction measures — certainly, some evidence for the validity of a particular self-report method should be demonstrated before research using such a measure is undertaken; or (2) investigators may choose to abandon research employing self-report measures and concentrate their energies on the study of interpersonal distance phenomena by means of interactional measures.

35 Michael Argyle and Janet Dean, "Eye-contact, Distance and Affiliation," *Sociometry*, 28 (1965), 289-304.

36 Kathleen D. Love and John R. Aiello, "A Comparison Between Observed Interaction Distances and Projective Distance Measures," paper presented at the 84th annual convention of the American Psychological Association, 1976.