

Personal space in nursery school children

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ABSTRACT

Personal space in nursery school children was examined by two methods. In one, unobtrusive observations of actual interpersonal distance choices in four different social situations were made. In the other, the same children chose interpersonal distances in four similar social situations represented symbolically by drawings. The results demonstrate that 4-year-old children already show regular variations in personal space based on acquaintance (Acquaintances closer than Strangers), sex (Boys greater than Girls), and social context (Informal greater than Formal). Three interactions are also significant. Projective and naturalistic observation measurement methods produced similar results, contrary to the conclusions of recent reviews. Conceptually, however, there may be two types of personal space, analogous to Murray's distinction between alpha and beta press.

The oft-studied phenomenon of interpersonal distance or personal space developed from observations by naturalists of regular inter-individual spacing in bird and animal species (e.g. Hediger, 1950). The possible application of the concept to humans was suggested by Hall (1959) and at about the same time empirical work began (e.g. Sommer, 1959). Reflecting its origins, personal space is usually measured as a chosen interpersonal distance. This paper bears on two implications of this: measurement by direct observation vs. measurement by "projective" methods, and some of the factors which influence the choice of interpersonal distance – sex, degree of acquaintance, and formality of the social context.

Particularly since Guardo's (1969) work, questions have naturally arisen about the developmental aspects of personal space. Adults possess a richer articulation of interpersonal distancing, but several studies (e.g. Bass & Weinstein, 1971) have shown that soon after children enter school they make reliable distinctions in interpersonal distance based on sex, acquaintance, and context. Distancing in children is related to age (Meisels & Guardo, 1969; Tennis & Dabbs, 1975), race (Koslin, Koslin, Pargament, & Bird, 1971) and apparently even somatotype of the other child (Lerner, Karabenick, & Meisels, 1975). All these studies used simulation measures of personal space.

Few studies of pre-school children have been undertaken, although Moreno (1953) claimed that space is used to represent social relations by

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children as young as 40 weeks old. Castell (1970) naturalistically observed that 1½ to 3 year old children stay closer to their mothers than to other children in strange environments as compared to familiar ones, but with time spent in the new setting gravitate towards the other children. In another direct observation study, Lomranz, Shapira, Choresch, and Gilat (1975) reported that 3 year olds use less space than 5 or 7 year olds, and that 3 year old boys keep greater distances from one another than girls keep from each other; this is an early prefiguration of the typical adult patterns in North American culture.

Still, the research with young children is not entirely consistent. This is due in part to a variety of methods, the most prominent bifurcation of which is between those which measure interpersonal distance "live" and those which ask the subject to estimate his or her interpersonal distance in a simulated situation. In Hayduk's (1975) review the frequently-used simulation methods are seen as a prime source of inconsistency in the literature. However, this represents Hayduk's evaluation of the stop-distance technique as the most attractive measure. Actually, other methods also have high reliabilities (e.g. Lerner et al., 1975; Haase & Markey, 1973). Ultimately, one must conclude that the validity of a personal space measure depends largely on which *other* measure is chosen as the criterion. As Haase and Markey (1973) found, competing measures of personal space cluster into distinct types. One implication of this is that different techniques may be equally valid, but they tap different aspects, dimensions, or portions of the variance in personal space. Hayduk's review also points towards the possibility that personal space is a multidimensional concept.

The present study was intended to clarify the methodological problem and the role of gender, acquaintance, and setting in the pre-school range. Lomranz et al. (1975) and Lerner et al. (1975) studied the pre-school age range, but not the effect of setting or acquaintance. Smetana, Bridgeman and Bridgeman (1978) used naturalistic observations only. Bass and Weinstein (1971) and Lerner et al. used only a simulation method; the former concluded with a suggestion that direct observation be used in the future because they were concerned not only about the possible invalidity of simulation, but the possible incapacity of young children to comprehend the task properly. Yet in a relatively complex map-reading task, Blaut, McCleary, and Blaut (1970) demonstrated that by the time children enter school they are capable of correctly interpreting symbolic space.

Inconsistencies in previous findings make directional hypotheses difficult. With respect to sex, Lomranz et al. (1975) reported differences between male and female same-sex pairs but Smetana et al. (1978), Bass and Weinstein (1971), and Lerner et al. (1975) reported no such differences. Meisels and Guardo (1969) and Tennis and Dabbs (1975) agreed that very

young male and female same-sex pairs use similar amounts of space. Hayduk (1975) called for more research on gender effects to clarify the situation; one goal of this study was to assist in this regard.

Most, if not all, studies of acquaintance find that as acquaintance increases, interpersonal distance decreases. There is little evidence in preschool children (Castell, 1970), but it is hypothesized that the relationship extends to that level.

In the only study with children of a comparable age which investigated the effect of setting, Bass and Weinstein found, perhaps counter-intuitively, that distances were smaller in a formal setting (principal's office) than in an informal setting (living room). However, setting interacted with acquaintance: the formal setting produced both the largest distances (with stranger) and the smallest (with friend).

METHOD

Subjects and Design

Both methods were employed concurrently. The direct observations of behavior were taken as the children were in the course of doing the simulation task. A fixed-effect $2 \times 2 \times 2 \times 2$ design was employed. The between-subject factor was sex (Male and Female) and the three within-subject factors were acquaintance (Stranger and Acquaintance), setting (Informal and Formal), and method (Simulation and Naturalistic). Each boy and girl was measured in all four situations by both methods. The children, 18 boys and 16 girls, consisted of all those between $3\frac{1}{2}$ and $5\frac{1}{2}$ years of age attending two nursery schools in southern Ontario. The mean age was 52.8 months. The children were predominantly middle class and nearly all Caucasian. The decision to study same-sex pairs appears appropriate, since Smetana et al. (1978) found in naturalistic observations of nursery school children that mixed-sex pairs occurred 56% less frequently than would be expected by chance.

Naturalistic settings were selected to resemble the simulation settings in their degree of formality and informality. However, to avoid having children realize they were being measured twice in an identical setting (e.g., a simulation of their playroom and then actually in their playroom), which might confound the findings, different but presumably equivalent formal (and informal) settings were used in the simulation and naturalistic methods.

Materials

The task stimuli in the projective study were modeled after those used by Bass and Weinstein. Two line drawings of rooms on sheets of 21×35 cm paper were made. The scale of these drawings was 18 mm to 1 foot of actual size of furniture and room dimensions. One (Formal setting) depicted a doctor's waiting room and included several armchairs, a lamp, a low central table and a picture on the wall. A child, drawn simply enough to be either a boy or a girl, was sitting in a chair. The other drawing (Informal setting), depicted a living room with a TV, couch, table, armchair, canvas chair, lamp, and toys on the floor. Both drawings were constructed so as to allow participants to choose from a range of seated distances, from very close to very far away within the room.

The figure used to express the participants' choice was a simple non-sexed cutout drawing similar to the child in the drawing. It was drawn in a seated position on both sides of the paper so it could "sit" in places on the left or right of the room.

Procedure

Each child was tested individually during regular school hours. The eight measurements of each child's chosen interpersonal distance were made two at a time (one simulated condition and one unobtrusive observation). The four pairs of situations were presented to the children in a randomized pattern to partially avoid order effects. The equivalent projective and naturalistic situations were never presented in the same session.

The description of a typical session follows: The experimenter went to where the children were playing and called the next child on the list, and they proceeded to the entrance of the experimental room. The informal setting was the nursery school's indoor play area and the formal setting was a room where ordinarily only the head teacher was allowed to go. As in the drawings, both rooms were set up with a range of chairs from which to choose, but the informal setting contained child-size chairs and the formal setting contained adult-size chairs. The room always had another child already seated in it. This child was either one of the subject's schoolmates (Acquaintance) or a child brought along with the experimenter from another part of town (Stranger). The other child was reading a book or putting together a puzzle and had been instructed to not initiate interaction with the new child, but to simply read or play. These confederates were in the same age range as the subjects.

At the entrance, the experimenter made an excuse to pause for a moment and told the subject to go ahead into the room and take a seat. Once the child had selected a seat, thereby fulfilling the direct observation condition, the experimenter entered and proceeded with the simulation condition. Subjective observation of the children gave the impression that they were entirely occupied with the simulation task and did not realize that two parallel techniques of personal space measurement were under way.

RESULTS

A summary of the means and standard scores of the personal space measurements is presented in Table 1.

The standard scores are given for ease of comparison across methods. For the analysis of variance, the scores from one method (naturalistic observation) were linearly transformed according to the scale of the drawings (18 mm = 1 foot) so that inter-method comparisons would be in the same units.

Schools

To check whether children at one school might, in general, choose different interpersonal distances from the other, comparisons between schools for each of the 8 measures were made. All 8 comparisons had non-significant ($p > .09$) t -values. A check of the statistical power of the t -tests (Cohen, 1977, Chapter 2) showed they had adequate power (.80) to discriminate a large effect size at the .05 level of significance. The personal space measures appear to generalize at least from one setting to another. In the subsequent analysis, measurements from the two schools were pooled.

TABLE 1

Mean standard score comparisons among personal space measures and methods

	Acquaintance							
	Formal				Informal			
	M_n	Z_n	M_s	Z_s	M_n	Z_n	M_s	Z_s
Boys	.88	-.30	4.50	-.44	1.03	-.18	12.38	.55
Girls	.63	-.50	3.56	-.56	1.02	-.18	5.34	-.33
	Stranger							
	Formal				Informal			
	M_n	Z_n	M_s	Z_s	M_n	Z_n	M_s	Z_s
Boys	2.07	.66	9.33	.17	1.56	.22	12.13	.52
Girls	1.22	-.02	10.31	.29	1.57	.26	6.44	-.20

Note. M_n (in m) and Z_n refer to the means and standard scores for the naturalistic observations. M_s (in cm) and Z_s refer to the means and standard scores for the simulation method.

Sex

Lomranz et al. found that in the 3-year-old range boy-boy pairs chose distances about 65% greater than girls. Other studies cited, primarily employing simulation methods, have reported no same-sex pair differences in the 5-year-old range. As may be seen in Table 1, male pairs keep greater distances in this 4-year-old sample. The difference (37% overall) is intermediate when compared with 3 and 5 year olds, suggesting an age-related trend. The main effect for sex in the ANOVA is significant [$F(1,32) = 12.26$, $p < .001$].

Acquaintance

The inverse relation between acquaintanceship and interpersonal distance frequently found in post-nursery age groups is also characteristic of these children. Across all conditions, stranger pairs kept 62% greater distances than acquainted pairs. This difference is highly significant [$F(1,32) = 43.88$, $p < .001$].

Setting

Formal and informal settings also produced differences in inter-individual spacings. Confirming the perhaps counter-intuitive findings of Bass and Weinstein, (1971) children in the formal settings sat closer together than in informal settings.

Measurement Method

Over all conditions, do the two methods of measuring personal space yield similar results? In this study, the answer is affirmative; differences between the distances chosen in the two methods are not significant [$F(1,32) = 1.30$, $p > .25$].

Interactions

In this design, there are a total of six two-way, four three-way, and one four-way interactions. Three of these interactions reached significance.

The largest of these is the Setting \times Sex \times Method interaction [$F(1,32) = 18.09$, $p < .001$]. In the projective measurement method, male and female pairs were found to choose similar distances in the formal setting, but male pairs chose much larger distances in the informal setting. In the naturalistic observation method, on the other hand, male pairs were much farther apart in the formal setting but the sexes chose similar distances in the informal setting.

The most obvious explanation of this finding is that formal and informal settings were not functionally identical in the two methods. Recall that the Informal condition in the projective method was represented by the child's living room at home, while the playroom at school was the informal setting in the naturalistic method. For the Formal setting, a doctor's office was used for one method and the head-teacher's private room for the other. These setting variations were insignificant as main effects and two-way interactions, but were important at the three-way level. It appears that the methods per se (simulation vs. naturalistic observation) produce similar responses overall, but the particular kind of setting chosen does affect children's choices in the special case when sex and formality are both salient. In sum, it seems likely that boys and girls vary in their conception of how one is to behave in the school playroom vs. home living room and the teacher's office vs. the doctor's office.

The other three-way interaction is that among Setting, Acquaintance, and Method [$F(1,32) = 5.21$, $p < .03$]. The gist of this interaction is a difference between acquaintances in formal vs. informal settings across the two methods. That is, acquaintances in the teacher's office (naturalistic method) sat closer together than did acquaintances in the doctor's office (simulation). Once again, it is less likely that this difference is due to method than it is due to the selection of certain settings to represent formal and informal conditions. The teacher's office may simply be more formal to the children than a doctor's office, producing more huddling among friends at the nursery school level.

The last significant interaction is Setting \times Acquaintance [$F(1,32) = 11.28, p < .003$]. Regardless of sex or method, formal settings produced both the greatest interpersonal distances (for stranger pairs) and the smallest interpersonal distances (for acquainted pairs). For 4 year olds, formal occasions appear to make strangers even less attractive and acquaintances even more attractive.

DISCUSSION

Although past research had made it clear that personal space is manifested at an early age, no previous work had examined situational factors as modifiers of chosen interpersonal space in pre-school children, nor had comparisons been made between behavioral and quasi-projective techniques in the pre-school age range. The results demonstrate clearly that, even by four years of age, not only do regularities in interpersonal distancing occur, but that children choose distances based on at least three contingencies and certain interactions.

Although F ratios do not always reflect the relative magnitude of effects, acquaintance appears to be the strongest influence among those included in this study on interpersonal distancing in nursery school children. Bass and Weinstein's results with 69-month-old children are extended down to the 53 month level in this study.

Sex differences in personal space have not been as consistent as one might assume from the oft-repeated assertion that males use more space than females in North American society (Hayduk, 1975; Altman, 1975). If there is a trend to be deduced from the literature on children's personal space, it may be as follows. For same-sex pairs, based on the present work and that of Lomranz et al. (1975), Tennis and Dabbs (1975), Bass and Weinstein (1971), Meisels and Guardo (1969), and Guardo (1969), it appears that boys use more space than girls at approximately 3, 7, and after 11 years of age, but use a similar amount at 5 and 10 years of age (cf. also Lerner et al., 1975). As others have noted, developmental trends in sex differences in personal space need more study. Our review suggests that from age 3 to 17 or so, a curvilinear expression of the third or perhaps fourth degree is necessary to account for sex-related vicissitudes in interpersonal space usage.

Setting is a small but significant main-effect determinant of spatial behavior in nursery school children. It is more important as it interacts with acquaintance, to suggest that distancing in a setting is a joint function of the formality of the setting and whether the other child is a known or unknown quantity. The three-way interactions involving setting and method, while real, may be less a product of lack of convergent validity of the two

assessment methods than a difference between operational definitions of formality and informality.

The failure of the two methods to produce main-effect differences is encouraging for those who use projective measures of personal space (provided that one considers naturalistic observation the true criterion). These findings do represent a minority view, however (cf. Hayduk, 1975; Tennis & Dabbs, 1975). The issue of the validity of projective techniques hinges on two questions. One is, *which* projective technique and *which* naturalistic technique are being compared? There may be some projective techniques which are superior to others, just as there may be superior and inferior naturalistic observation methods. Second, personal space may not be a unitary concept, though these results tend to suggest that it is. Should our findings go unconfirmed, as might be expected if Hayduk's review is correct in making a distinction between "real" and "paper-and-pencil" personal spaces, the following speculation may be in order. Analogous to Murray's venerable distinction, it is possible to conceptualize projective personal space as beta, or perceived interpersonal distance, while conceptualizing naturalistic personal space as alpha, or objective interpersonal distance. In the sense that either of these may predict other behaviors as an independent variable – perhaps alpha personal space predicts some behaviors better and beta personal space predicts other behaviors better – neither is more valid. Which is the more valid empirically (i.e., as a valuable predictor of other social behaviors) remains to be seen.

Finally, Bass and Weinstein (1971) concluded that pre-school children have difficulty utilizing symbolic space (i.e., responding to projective tests of personal space). They cited Piaget as support for the assertion that spatial perception is not consolidated until approximately the eighth year. But whether our administration of the task was sufficiently careful (we heeded Bass and Weinstein's caution in this regard) or the type of spatial perception involved in this particular task is different from that referred to by Piaget, these nursery school children apparently could work in symbolic space well enough to accurately predict their own behavior in the real world.

RÉSUMÉ

Utilisation de deux méthodes pour étudier l'espace personnel chez des enfants d'école maternelle. Une des méthodes est fondée sur des observations discrètes des choix de distance interpersonnelle effectués en quatre situations sociales différentes. L'autre méthode consiste à faire choisir des distances interpersonnelles par les mêmes enfants en quatre situations sociales semblables, mais représentées symboliquement par des dessins. Les résultats montrent que des enfants de quatre ans manifestent déjà des changements d'espace personnel selon le degré de connaissance (les étrangers sont plus distants que les personnes déjà

connues), le sexe (les distances sont plus grandes chez les garçons que chez les filles), et le contexte social (les distances sont plus grandes en situation non formelle qu'en situation formelle). Les deux méthodes donnent des résultats semblables, contrairement à ce qu'on trouve dans la littérature. Toutefois, il faut peut-être concevoir deux types d'espace personnel, un peu comme la distinction faite par Murray entre pression alpha et pression bêta.

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