PERSONAL SPACE RESEARCH

Max Portrey
Oklahoma State University

THE SIMULATED SPACE PROBLEM

A general, though not unique problem in simulated personal space research is the lack of conceptual operational consistency. In a review of more than fifty studies, marked discrepancies were found in three vital areas: 1) the conceptual definition of personal space; 2) the operational procedures, in the form of instructional sets; and 3) the instrumentation used in such research. To determine whether these differences in concept, operation, and instrumentation affected results, two experiments were analyzed. One is a replication of the figure placement task, common to simulated research. The other is a role enactment simulation with face to face encounter of subject and the same sex experimenter. The results indicate that differences in operation and instrumentation do account for much of the differences in research outcomes.

The varied methodological approaches employed for research in personal space can be divided into ethological and laboratory procedures. Most of the laboratory procedures apply simulated personal space with the figure placement task. This task requires the subject to place two silhouettes on a background in a given spacial arrangement. The measured distance between the two figures presumably indicates the requirement for personal space, but the findings are often inconsistent. In simulated research, a number of methodological inconsistencies confound the results. 1) There is considerable variation in the conceptual definition of personal space. 2) The instructional sets vary across studies, and thus depict differing spatial zones. 3) There is a lack of conceptual operational consistency. 4) The physical instrument and figure dimensions vary greatly across studies.

To resolve this issue, we must summarize the differences in conceptual definitions and the differences in laboratory procedures in simulated personal space research. Then we shall show that differences in outcomes can be attributed, at least in part, to variation in laboratory procedure in research on simulated interpersonal space, and to differences in distance implicit in the definitional concept of personal space, as reflected in the instructions.

DEFINING INTERPERSONAL SPACE

Most frequently used is Sommer's definition of personal space as ".. an area with invisible boundaries surrounding a person's body into which others may not come ..", characterized as ".. an emotionally charged bubble that helps to regulate the spacing of individuals."(Sommer 1969; Dosey, Meisels 1969; Evans, Howard 1973; Knowles 1972; Pedersen 1973a 1973b) This implies that people will not space themselves so as to violate those "invisible boundaries". In ordinary social situations, a person's spatial arrangement with others will reflect boundaries outside the personal space area. Personal space is thus defined as a behavioral property of individuals. Further, any operation designed to depict personal space, as defined by Sommer, must refer to a private and protected spatial area.

Another definition of personal space often used in simulated space research has been developed by Little: Personal space is: ".. that area surrounding an individual in which the majority of his interaction with others takes place." (Little 1965 237; Booream, Flowers 1972; Fortson, Larson 1968; Fry, Willis 1971; Guardo 1969; Guardo, Meisels 1971; Horowitz 1968; Horowitz, Duff, Stratton 1964; Mehrabian 1968; and Pedersen 1973c) Other researchers leave

personal space undefined. (Keuthe 1962a 1962b; Keuthe, Stricker 1963; Keuthe, Weingartner 1964; Mehrabian 1965 1969a 1969b; Weinstein 1965 1967; Wolowitz 1967; Williams 1971) This definition thus refers to a shared social spatial area which is not private, and is not protected. Indeed, as space is claimed by two or more individuals, protection of this space from intrusion is not a relevant concept within the interactional definition.

These divergent approaches becloud the understanding and application of personal space concepts. Since researchers use two distinct definitions, and categorize two different areas in personal space, the comparison of results seems inappropriate (Evans, Howard 1971; Haase, Markey 1973; Little 1965; Pedersen 1973d). The Sommer definition and the Little definition seem to be incompatible. The Sommer definition refers to private and personal space which is claimed exclusiveley as one's own. The Little definition treats personal space as an area shared with others in an interaction process. The Sommer definition implies the minimal spatial region which may not be penetrated. The Little definition of an interaction area implies an inter-person space shared between two actors, marked by responsive action which is implicitly larger that the "no entry" space of the individual. The "limit of tolerable closeness" is the experimenter's instruction for the Sommer model. The "comfortably close for conversation" and the "usual distance for most social contacts" applies Little's interaction space model. We propose that an experimental contrast will demonstrate a larger space for the interaction space model than for the "no entry" personal space model.

PERSONAL SPACE RESEARCH MODELS

We are particularly concerned with unmeasured mapping and ratio mapping in the simulated personal space studies. The most widely used instructional sets are sufficiently different as to depict disparate spatial areas. There are three main types. In the first, no specific distance or feeling state is mentioned. The subject is merely asked to place figures on the background "as if they were talking". (Blumenthal, Metzoff 1967; Forston, Larson 1968; Guardo 1969; Guardo, Meisels 1971; Kleck 1968; Keuthe 1962a 1962b; Keuthe, Stricker 1973; Keuthe, Weingartner 1964; Little 1965 1968) The second instruction is that the subject is to place the figures in reference to a specific feeling state: ".. place the figures at a distance which is as close as comfortable for conversation." (Pedersen 1963a 1973b 1973c; Haase, Markey 1973; Stratton, Tekippe, Flick 1973) The third instructional set requires that subjects place figures so that the distance between them represents ".. the distance between people in most social situations." (Horowitz, Duff, Stratton 1974; Pedersen 1973a 1973b 1973c; Rawls 1972) These instructional sets are divergent. The distance which is as close as comfortable for conversation is smaller than that which people maintain in most social situations. Presumably, one strikes an average between the more remote contacts with authority figures, and strangers, and the more proximate contacts with friends and intimates. It is assumed that when no specific feeling state is mentioned, subjects respond to an optimal distance which people maintain in most social situations.

Simulated personal space research does not appear to measure the behavioral dimension, as is assumed. Most research employs operations with depict interaction distance, as more or less explicitly indicated in the various instructions. These studies appear to construct a zone around an individual which may be larger that actual personal space require-

ments. If so, the results of simulated personal space research and behavioral personal space research are not strictly comparable.

The problem of comparability is compounded by the fact that research instruments, comprizing boards and cutout figures, vary greatly. Board size ranges from 21.5 x 61 centimeters (Kleck 1968) to 140 x 180 centimeters (Guardo, Meisels 1969) Figure height ranges from 2.5 centimeters (Kleck 1969) to 25 centimeters (Keuthe & Stricker 1963). By varying the size of the board, the researcher is altering the size of the environment with which the subject deals, if the height of the figures is held constant. Given the fact that figure and board size, as well as the ratio between them seem to vary independently of the research problem, one could ask to what extent the inconsistent results might be an artifact of variant instrumentation. The problem needs clarification, since there is a lack of consistency in so many aspects of simulated personal space research.

HYPOTHESES AND METHOD

Some of the ambiguity developed in the simulated personal space research can be reduced if we can determine the effect of difference in conceptual space implicit in the instructions, and the effect of difference in the size of the background, relative to the figures or silhouettes representing persons supposed to be interacting face to face. This determination can be made by testing two hypotheses. Hypothesis 1: In simulated personal space research, the interpersonal distance relates directly to the distance suggested by the instruction. Hypothesis 2: In simulated personal space research, the interpersonal distance relates positively to the size of the board on which the relation is simulated, provided that the size of the figures is held constant. If the first hypothesis is tenable, then the conceptual definition of personal space must be made explicit in simulation research. If the second hypothesis is tenable, then the ratio of figure to ground should be controlled and specified in simulation research. These hypotheses refer to the degree to which divergent operational procedures produce divergent results. If both hypotheses are tenable, the effects of the different methods become apparent. These hypotheses will be tested twice: first with figure and board simulation, and second, through role enactment simulation of personal space limits.

FIGURE AND BOARD SIMULATION

Board size: The small board was 21 x 28 centimeters, and the large board was 60 x 90 centimeters. The silhouettes were 15 centimeters high. Both boards were constructed of plexiglass with brown paper backing. The boards were attached to the wall of an experimental room in such a manner that the center of the large board could be superimposed exactly over the center of the small board.

Subjects: Ninety female college students between the ages of 18 and 25 were recruited in classes and in passageways, with the request that they participate in a social psychological experiment lasting less than one minute. When they agreed to participate, they were escorted to a waiting room adjoining the experimental room.

Procedure: On arrival in the experimental room, subjects were randomly assigned to one of six experimental conditions. For each of two board sizes, there were three placement instructions: 1) Minimal distance Place these figures on the board so that the distance between them represents that distance such that to move them any closer would put each in an area around the other's body where neither would want

the other. 2) Intermediate distance Place these figures in the board so that the distance between them represents that distance which is as close as comfortable for conversation. 3) Remote distance Place these figures on the board so that the distance between them represents that which people maintain in most social situations. After each subject placed the figures on the board, the experimenter measured the distance between the chests of the two figures to the nearest two millimeters.

ROLE ENACTMENT SITUATION

Experimental room: The experiment was performed in a seminar room measuring 4.0 x 5.5 meters, from which the furniture had been removed. The room was lighted by overhead lights, and by four large windows on one side.

Subjects: Two hundred forty female college students were recruited as in the previous experiment, with the promise that the experiment would take less than one minute. They were between the ages of 18 and 25 years.

Procedure: Subjects were randomly assigned to one of six experimental conditions. There were two ground conditions, in both of which the experimenter was female. In both conditions, the experimenter and subject stood facing each other at opposite ends of the seminar room, at a distance of 4.5 meters. In the first condition, the subject was told that the experimenter would approach the subject, and that the subject should order the experimenter to stop according to one of the three distance instructions, as stated in the figure and board experiment. In the second condition, the experimenter remained stationary at one end of the room, and the subject was instructed to approach the experimenter, and to stop herself according to one of the three distance instructions. At the end of each experiment, the experimenter measured the toe to toe distance between subject and experimenter at the stopping point, to the nearest centimeter.

DISCUSSION

The results of the two experiments are consistent with, and in support of the two hypotheses. Both the board size in the figure and board experiment, and the object of placement control in the role enactment experiment significantly affected the interperson intervals, and the variation in the suggested distances in the three instructions also produced significant differences in the measures, as shown in Table 1. Of the two experiments, the role enactment experiment seems more "true to life" than the figure and board experiment. The environmental situation is actual, rather than symbolic, and the subject can apply her own habitual spatial relationships in a fairly familiar classroom environment. The most veridical interperson distances are probably those resulting when the subject controlled her own approach to the experimenter. The clearest distinction in this condition appears between Instruction 1, "the limit of tolerable closeness", and Instruction 2, "as close a comfortable for conversation", where the comfortable distance is about twice as great as the smallest tolerable distance. The distance for Instruciton 3, for "most social contacts" is about 25 percent greater.

The subject in the role enactment experiment is less successful in controlling the experimenter's approach, than in controlling her own approach. We attribute this to the lag time in the experimenter's response to the subject's order to stop. The distances are all significantly smaller, but the ratios between types of instruction are also fairly well maintained.

The results from the figure and board experiment are in basic agreement with those of the role

TABLE 1: INTERPERSONAL DISTANCE IN SIMULATED & LIVE EXPERIMENTS
(Mean distance in centimeters)

Placement instruction	Simulated Board size:		Role enactment Subject controls:	
	Large	Small	Researcher	Self
1 Tolerable closeness limit	2.2	4.9	14.2	27.3
2 Comfortably close for talk	3.6	4.8	41.3	52.7
3 Most social situations	5.7	7.4	51.6	65.1

Analysis of variance	F	df	p	F	df	p
Board size; Approach	8.7	1	.004	34.2	1	.0001
Instruction	18.1	2	.0001	106.5	2	.0001
Interaction	2.9	2	.06	0.1	2	.916

enactment experiment, although the effect of the difference between Instruction 1 and Instruction 2 is not apparent when the large board is used. Board size does make a major difference, resulting in one-and-a-half to two times as much distance for the larger board, compared to the distance on the smaller board. The effects of difference in distance implicit in the three instructions are clearly in support of the hypotheses, and lead the conclusion that a measurable part of the effect in interperson distance results in figure and board experiments may be attributed to differences in conceptual definitions, and in the wording of instructions which reflect differences in personal space and interpersonal behavior.

The finding that the large board produced significantly larger distances than the small board agrees with the room size effect reported in crowding research. Although the results in crowding research are inconclusive, some of the trends agree rather closely with the present findings. For example, interaction in smaller rooms tends to produce smaller interpersonal distance, and smaller rooms produce a perception of less space, which appears to explain the reduced interpersonal distance.(Stockdale 1978; Stokols 1973; Desor 1972; Freedman 1971)

Instrument variation poses problems for simulated personal space research. To compare results across studies seems pointless in the light of this fact. To date, simulated research findings are experimentally established only in relative terms. Thus, males place figures at greater distances than do females. This provides some information, but it is not definitive of specific distance requirements in various settings. There is no compelling reason to limit analysis of linear distances to the ordinal level. If simulated personal space measures are to give a more complete representation of human spatial behavior, the research instruments should be standardized in terms of environmental dimensions.

Differences attributable to instructional sets suggest that to compare results across studies may be misleading. The instructional sets generally used in personal space research produce variation in interaction distances apart from those conceptually incorporated in personal space. Not only is simulated personal space research

characterized by incongruency of concepts and operations, but different operations produce different figure displacements. Perhaps the behavioral dimension of personal space cannot be measured by simulation experiments. As a final note, since the instructional sets typically employed in such research refer to an interactional spatial area, one is led to the conclusion that similated personal space research measures interactional space dimensions, rather than personal space, as it purports to do.

REFERENCES

Blumenthal R, S Meltzoff 1967 Social schemes & perceptual accuracy in schizophrenics. British J of Social & Clinical Psych 6,119-128

Booream C, J Flowers 1972 Reduction of anxiety & personal space as function of assertion training of severely disturbed neurospsychiatric inpatients. Psychological Reports 30 923-929

Cohen J 1975 The effects of situational variables on judgments of crowding. Sociometry 38 273-281

Desor J 1972 Toward a psychological theory of crowding. J Personality & Social Psychology 21 79-83

Dosey M, M Meisels 1969 Personal space & self protection. J Personality & Social Psychology 11 93-97

Evans G, R Howard 1973 Personal space. Psychological Bltn 80 334-344

Fortson R, C Larson 1968 Dynamics of personal space. J Communications 18 109-116

Freedman J Effect of crowding on human task performances. J Applied Social Psychology 1 7-25

Fry A, F Willis 1971 Invasion of personal space as function of age of invader. Psychological Record 21 385-389

Guardo C 1969 Personal space in children. Child Development 4 143-153

Guardo C, M Meisels 1971 Child-parent spatial patterns under praise and reproof. Developmental Psychology 5 365-371

Haase R, M Markey 1973 Methodological note on study of personal space. J Consulting & Clinical Psychology 40 122-125

Hall E 1960 Language of space. Landscape 10 41-44

_____ 1960 The Hidden Dimension. New York, Doubleday

Hartnett J 1970 Personal space as influenced by sex & type of movement. J Psychology 76 139-144

Hobbs N 1966 Helping disturbed children: psychological & ecological strategies. American Psychologist 21 1105-1115

Horowitz M 1968 Spatial behavior & psychopathology. J Nervous & Mental Diseases 146 24-25

Horowitz M, F Duff, L Stratton 1964 Personal space & body buffer zone. Archives of General Psychiatry 11 651-656

Keuthe J 1962a Social schemas. J Abnormal & Social Psychology 64 31-38

_____ 1962b Social schemas and reconstruction of social object displays from memory. J Abnormal & Social Psychology 65 71-74

_____ 1964 Pervasive influence of social schemata. J Abnormal & Social Psychology 68 248-254

Keuthe J, G Stricker 1963 Man & woman: social schemata of males. Psychological Reports 13 655-661

Keuthe J, N Weingartner 1964 Male-female schemata of homosexual & non-homosexual in penitentiary inmates. J Personality 32 23-31

*

Kleck R 1969 Physical stigma & task oriented interactions. Human Relations 33 53-60

_____ Effect of stigmatizing conditions on use of personal space. Psychological Reports 23 111-118

Knowles E 1972 Boundaries around social space: dyadic response to an invader. Environment & Behavior 4

Liebman M 1971 Effects of sex & race norms on personal space. Environment & Behavior 2 208-246

Little K 1965 Personal space. J Experimental Social Psychology 1

237-247

_____ 1968 Cultural variations of social schema. J Personality & Social Psychology 90 1-9

Lyman S, M Scott 1967 Territoriality: a neglected dimension. Social Problems 15 236-249

Luft J 1966 One non-verbal interaction. J Psychology 63 261-268

Mehrabian A 1965 Communication length as index of communicator attitude. Psychological Reports 17 519-522

_____ Relationship of attitude to seated posture, orientation & distance. J Personality & Soccial Psychology 10 26-30

_____ 1969b Some referents & measures of non-verbal behavior. Research, Methods & Instrumentation 1 203-207

Meisels M, E Canter 1970 Personal space & personality characteristics: a non-conformation. Psychological Reports 27 287-290

Pedersen D 1973a Prediction of behavioral personal space & motor skills. Perceptual & Motor Skills 37 803-813

_____1973b Correlates of behavioral personal space. Psychological Reports 32 828-830

_____ Personality & demographic correlates of simulated personal space. J Psychology 85 101-108

_____ 1973d Developmental trends in personal space. J Psychology 83 3-10

Rawls J 1972 Personal space as predictor of performance under close working conditions. J Social Psychology 86 261-267

Rosenthal R, R Rosnow 1969 Artifact in behavioral research. Social Psychology Monographs, New York Academic Press

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

_____ Small group ecology. Psychological Bltn 66 145-152

_____ 1968 Intimacy ratings in five countries. International J of Psychology 3 109-114

_____ 1969 Personal Space: The Behavioral Bias of Design. Englewood Cliffs, N.J. Prentice Hall

Stokols D, M Binner, N Schopler 1973 Physical, social, and personal determinants of the perception of crowding. Environment & Behavior 5

Stockade J 1978 Crowding: determinants & effects. Advances in Experimental Social Psychology V 11 197-247 New York, Academic Press

Stratton F 1973 Personal space & self concept. Sociometry 36 424-429

Weinstein L Social schemata of emotionally disturbed boys. J Abnormal Psychology 70 457-461

_____ 1967 Social experience in social schemata. J Personality & Social Psychology 6 429-434

Williams J 1971 Personal space & its relation to introversion & extroversion. Canadian J Behavioral Science 3 156-160

Wolowitz H 1967 Attraction & aversion to power: a psychoanalytic conflict theory of homosexuality in male paranoids. J Abnormal Psychology 70 360-367