DEVELOPMENT OF PERSONAL SPACE SCHEMATA

MURRAY MEISELS
Eastern Michigan University

CAROL J. GUARDO
University of Denver

The development of personal space schemata was investigated in 431 males and females in third through tenth grades. The Ss were given paper-and-pencil measures of spatial usage in 20 situations involving positive, neutral, and negative affect. Major findings were: the inverse relationship between amount of distance and degree of liking and acquaintance is established by third grade; Hall's (1964) conceptualized personal space zones apply to childhood spatial schemata; children generally use less space as they grow older; in positive- and neutral-affect situations, both sexes place themselves closer to same-sexed peers in earlier grades and to opposite-sexed peers in later grades. Results were in accord with knowledge about social development and the formation of sex-role identity.

The notion of personal space used in this research derives primarily from the ideas and observations of the anthropologist Hall and the psychological investigations of Little. Hall (1961) conceived of personal space as a series of concentric circles with the individual as their center. Within the confines of the areas delimited by these circles, various types of interpersonal behavior occur. These zones are labeled the intimate (0–18 inches), the casual-personal (18–48 inches), the social-consultative (48–144 inches), and public domain (Hall 1964).

Little (1965, p. 237) defined personal space as “the area immediately surrounding the individual in which the majority of his interactions with

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others takes place." Operationally, he has defined personal space in terms of the placement of human figure statuettes and by the staging of real actresses. In a series of studies conducted with college students (Little 1965, 1968; Little & Ulehla 1966; Little, Ulehla, & Henderson 1968) and designed to establish the boundaries of personal space zones, it was found that several factors modify the specific distances placed between figures. These factors include the nature of the interaction, the degree of acquaintance attributed to dyad members, the setting for the interaction, the sex and shared beliefs of the dyad members, and the sex and the cultural background of the Ss.

In particular, Little (1965) reported that the distance placed between members of the dyads was influenced by the degree of friendship (liking) and acquaintance attributed to them. In brief, the distance between members of the dyads decreased as degree of friendship and acquaintance increased. The inverse relation held regardless of the sex of the observer or the sex pairing of the dyad observed. The findings suggested that young adults assume a correlation between spatial proximity and interpersonal closeness.

Guardo (1969) has shown that data from sixth-grade children also demonstrate strong and significant inverse relations between interfigure distances and degree of acquaintance as well as between interfigure distances and degree of liking. When Ss were instructed to assign acquaintance and liking designations to pictured silhouettes of same-sexed dyads depicted in face-to-face relations, degree of attributed acquaintance and liking decreased as the distance between dyad members increased. It was concluded from these findings that sixth graders likewise assume a correlation between physical proximity and psychological closeness.

Guardo also found that when children were instructed to project themselves into the dyadic situations, the same significant, inverse relations obtained. The "projection" was accomplished by having each S set a manipulable silhouette figure (representing the S himself) in relation to printed, same-sexed peer figures described in various ways. Additionally, sex differences were evident. Boys positioned their figures significantly farther from peers described as best friends and from peers liked very much, but significantly closer to feared and threatening peers than did girls.

It should be noted that, although the operational definitions of social schemata of the Little studies, Guardo's study (1969) and the present research are similar to those of Kuethe (e.g., 1962, 1964), the underlying assumptions appear to be different. According to Little (1965, 1968), personal space schemata are assumed to exist a priori in structured form, and the schemata are considered to be isomorphic with the patterning of actual interpersonal interaction distances. For Kuethe, the schemata seemingly are not assumed to exist a priori, and they apparently may or may not be isomorphic with actual interpersonal interaction distances.

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The present research was designed to explore the use of personal space schemata by children of different ages. Its main objectives were to ascertain (a) if the perception of personal space schemata evidences a developmental pattern, (b) if there are sex differences in how distances are set to implement psychological relationships, (c) how distances are set to implement psychological relationships when children relate self-referent figures to opposite-sexed as well as same-sexed peer figures, and (d) how distances are set to implement psychological relationships when children relate self-referent figures to groups of peers (of both sexes) as well as to individual peers.

**METHOD**

**Subjects**

Pupils in two laboratory schools affiliated with Eastern Michigan University were tested. Students in grades 3 through 10 were tested in one school and those in grades 3 through 8 in the other (see table 1).

**Materials**

The personal space task was presented in the form of a multilithed test booklet. It consisted of 20 stimulus presentations divided into four subsections. The first subsection consisted of seven depictions of same-sexed, individual peer figures shown in silhouette; the second, of seven opposite-sexed, individual peer figures; the third, of three presentations of three-figure groups of same-sexed peers; and the fourth, of three presentations of three-figure groups of opposite-sexed peers. Each stimulus presentation was made on a single sheet of legal-sized paper. The silhouettes used were scaled one inch to the foot and represented the Ss' age-appropriate

<table>
<thead>
<tr>
<th>TABLE 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NUMBER OF SUBJECTS BY SEX AND GRADE FROM EACH SCHOOL SAMPLED</strong></td>
</tr>
<tr>
<td><strong>GRADE</strong></td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
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<tr>
<td>5</td>
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<tr>
<td>6</td>
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<td>7</td>
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<td>8</td>
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<tr>
<td>9</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
</tr>
</tbody>
</table>
peer group. Two sets of silhouettes were used—one for Ss in grades 3 through 6 and the other for Ss in grades 7 through 10.

Procedure

The Ss were tested in groups in their respective classrooms. For each presentation, the S was instructed to place and trace the cutout manipulable silhouette figure (representing himself) in face-to-face relation to each preprinted figure(s) which E described. For all presentations, the instruction was: “This is . . . [appropriate designated description]. Where would you be standing?” In the first two subsections of the task, the stimulus figure was described as follows: (1) a best friend (Friend), (2) an acquaintance (Acquaintance), (3) a stranger (Stranger), (4) someone liked very much (Like), (5) someone neither liked nor disliked (Neutral), (6) someone disliked very much (Dislike), or (7) someone feared (Fear). These 14 descriptions of same- and opposite-sexed peers were presented in random order, constant for all groups of Ss. In the latter two subsections of the task, the group stimulus figures were described, in random order, as friends (Group Friends), strangers (Group Strangers), or feared peers (Group Fear). In the instructions, the setting given for all interactions was the “schoolyard.” Setting was maintained constant in order to eliminate possible setting effects found by Little (1965). (In addition, blank sheets were provided after the seventh and seventeenth presentations and S was instructed to draw “a person” on the first sheet and a person of the sex opposite to the first on the second sheet. These drawings were included to collect data relevant to a set of concerns not directly related to the present study and, hence, are not considered here.)

RESULTS

For each of the 20 personal space situations, mean interfigure distance scores, in inches, were obtained separately for males and females for each grade at each school. Inspection of the mean scores of the two schools for grade and sex differences indicated that these differences were minimal and negligible. The combined results for the two schools were considered most representative of the findings, and, hence, the results reported below are based on mean score comparisons from the combined data.

Distance and Degree of Acquaintance and Liking

The mean scores strongly support previous findings (e.g., Little 1965; Guardo 1969) on the inverse distance-acquaintance relationship, though

1 For a two-page table giving mean scores separately for males and females for 20 situations at eight grade levels, order NAPS Document 00591 from ASIS

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they indicate little regarding a developmental pattern. The general pattern was that mean Stranger settings were greater than those for Acquaintance which, in turn, were greater than those for Friend. This held for female distance from both the same and opposite sex at all grade levels, for male distance from the same sex at all grade levels except the ninth, and for male distance from the opposite sex in sixth through tenth grades. The only inconsistencies in the pattern were that male means for Acquaintance were greater than those for Stranger at third, fourth, and fifth grades with the opposite sex and at ninth grade with the same sex. The overall consistency of these findings obviated the necessity of inferential statistics, and it was concluded that, with one exception, the inverse distance-acquaintance relationship is established by the third grade. The exception is that male spatial distance schemata with opposite-sexed strangers and acquaintances show a developmental pattern continuing through elementary school until, by sixth grade, the typical inverse distance-acquaintance relationship is manifested.

The results also provide strong support for the inverse distance-liking relationship. For males and females at every grade level, whether dealing with members of the same or opposite sex, the mean distances for Dislike were greater than for Neutral, which were, in turn, greater than for Like in all instances. Thus, from third grade on, a strong pattern exists for more distance to be assigned as degree of liking decreases. In short, the results for both the acquaintance and liking dimensions indicate that by third grade physical proximity and psychological closeness is an already well-established social schema.

The mean interfigure distance scores for degree of acquaintance and liking were scaled one inch to the foot and thus were compared with Hall's (1964) conceptualized personal space zones. Hall maintains that within each zone specified types of interpersonal interactions take place, and it was expected that these zones would be related to the children's personal space schemata. The results indicated that the mean scores for Friend and Like closely correspond to Hall's intimate zone (0–18 inches), with 59 of the 64 means inside Hall's postulated spatial range for intimate interaction (the 64 means comprise male and female distances toward members of the same and opposite sex at eight grade levels). Similarly, 52 of the 64 means for Acquaintance and Neutral fall in Hall's casual-personal zone (18–48 inches), as do 28 of the 32 interfigure means for Stranger. For Dislike, 26 of the 32 means extend beyond the casual-personal zone. Consistent with these results, the means for Group Friends (25 of 32) fit primarily in the intimate zone, those for Group Strangers (26 of 32) primarily in
the casual-personal zone, and those for Fear and Group Fear (51 of 64) mostly beyond the casual-personal zone. In sum, these results are quite consistent with Hall’s notions and indicate that the concept of personal space zones is applicable to child as well as adult personal space schemata.

**Developmental Patterns**

In order to determine developmental patterns, analyses of variance for unequal cell frequencies were completed comparing sex (between), grade (between), and sex of object (within; e.g., distance from same vs. opposite-sexed Friend, Acquaintance, etc.). The results of these analyses are presented in table 2. Ten analyses yielded a total of 70 tests of statistical significance, of which 37 were significant at <.01 and six at <.05. The results for main and interaction effects are considered in turn. The findings are described in terms of the positive and negative affective components of the stimulus situations, as assessed by mean interfigure distance scores. The 10 situations were considered to reflect conditions involving positive affect (Friend, Like, Group Friends), neutral affect (Acquaintance, Stranger, Neutral, Group Strangers), or negative affect (Dislike, Fear, Group Fear).

**Sex differences.**—Of the 10 analyses, seven showed statistically significant differences. Females employed greater spatial distances in all neutral- and negative-affect conditions except Acquaintance, and males used more distance under the one positive-affect condition Friend. For Dislike, Fear, and Group Fear, females consistently used more space than males across most grade levels, regardless of the sex pairing of the dyad involved. It was concluded that there is a strong schema for females to use more physical distance than do males under negative-affect conditions. Lastly, the sex differences for four of the stimulus situations (Friend, Stranger, Neutral, and Group Strangers) were not consistently found across grade level and/or sex of object, and thus were not regarded as comprehensive schemata.

**Grade differences.**—Of the 10 comparisons, nine were statistically significant; the exception was Group Friends. In all instances, younger children employed greater spatial distances, although there was considerable grade-to-grade fluctuation for Like and Group Fear. Further analyses of these scores, using a two (sex) by eight (grade) design for unequal cell frequencies, indicated that children use more space as they grow older in positive-affect situations with same-sexed peers (Like: \( F = 7.415 \), \( p < .01 \); and Group Friends: \( F = 3.06 \), \( p < .01 \)). It was concluded that, with this important exception, children’s spatial schemata generally change with age in the direction of closer physical proximity.

**Sex \( \times \) grade interaction.**—Five of these interaction effects were statistically significant. The pattern for four of the interactions, involving positive- and neutral-affect situations (Friend, Acquaintance, Stranger, Group
### TABLE 2

**Analysis of Variance of Spatial Distances (Mean Squares)**

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>Friend</th>
<th>Acquaintance</th>
<th>Stranger</th>
<th>Like</th>
<th>Neutral</th>
<th>Dislike</th>
<th>Fear</th>
<th>Group Friend</th>
<th>Group Str.</th>
<th>Group Fear</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (sex)</td>
<td>1</td>
<td>10.79**</td>
<td>0.74</td>
<td>52.69**</td>
<td>1.81</td>
<td>19.01**</td>
<td>76.26**</td>
<td>332.66**</td>
<td>0.57</td>
<td>29.11**</td>
<td>416.35**</td>
</tr>
<tr>
<td>B (grade)</td>
<td>7</td>
<td>9.82**</td>
<td>16.02**</td>
<td>15.45**</td>
<td>3.89**</td>
<td>34.55**</td>
<td>31.73**</td>
<td>31.59**</td>
<td>3.53</td>
<td>18.20**</td>
<td>14.44**</td>
</tr>
<tr>
<td>A × B</td>
<td>7</td>
<td>3.96**</td>
<td>13.47**</td>
<td>13.47**</td>
<td>0.98</td>
<td>1.35</td>
<td>4.45</td>
<td>9.07**</td>
<td>2.47</td>
<td>13.95*</td>
<td>4.04</td>
</tr>
<tr>
<td>Error (between)</td>
<td>415</td>
<td>1.28</td>
<td>2.60</td>
<td>3.43</td>
<td>0.91</td>
<td>3.01</td>
<td>3.78</td>
<td>4.22</td>
<td>1.76</td>
<td>6.32</td>
<td>5.91</td>
</tr>
<tr>
<td>C (sex of object)</td>
<td>1</td>
<td>1.48</td>
<td>58.40**</td>
<td>107.68**</td>
<td>0.22</td>
<td>19.87**</td>
<td>30.69**</td>
<td>36.08**</td>
<td>38.33**</td>
<td>112.55**</td>
<td>126.76**</td>
</tr>
<tr>
<td>A × C</td>
<td>1</td>
<td>0.53</td>
<td>0.07</td>
<td>34.46**</td>
<td>0.00</td>
<td>7.36</td>
<td>1.22</td>
<td>43.61**</td>
<td>0.36</td>
<td>75.34**</td>
<td>135.36**</td>
</tr>
<tr>
<td>B × C</td>
<td>7</td>
<td>9.69**</td>
<td>36.05**</td>
<td>12.81**</td>
<td>5.81**</td>
<td>8.30**</td>
<td>3.02</td>
<td>4.15</td>
<td>16.18**</td>
<td>8.20</td>
<td>5.01</td>
</tr>
<tr>
<td>A × B × C</td>
<td>7</td>
<td>6.33**</td>
<td>8.73**</td>
<td>2.31</td>
<td>2.06*</td>
<td>1.78</td>
<td>2.90</td>
<td>1.74</td>
<td>5.59**</td>
<td>6.65</td>
<td>2.55</td>
</tr>
<tr>
<td>Error (within)</td>
<td>415</td>
<td>1.12</td>
<td>1.78</td>
<td>2.06</td>
<td>0.74</td>
<td>2.11</td>
<td>1.82</td>
<td>2.48</td>
<td>1.42</td>
<td>4.01</td>
<td>2.88</td>
</tr>
</tbody>
</table>

* p < .05.  ** p < .01.
Strangers), indicated that males used more space in third grade and sometimes also in fourth and fifth grades, that females generally used more distance from fifth grade onward, that females were especially distant in sixth and eighth grades, and that by ninth and tenth grades there was little difference between the sexes in spatial usage. These interaction effects indicate that, though males in some situations are initially inclined, at grade 3, toward schemata involving greater spatial usage, they rather quickly adopt the attitude of closer physical proximity in subsequent grades. The remaining significant interaction effect was for Fear. In this instance, females showed a consistent pattern of large spatial distance across all grades, while males gradually decreased in amount of distance used as they grew older.

Sex of object.—All the comparisons of the distances used with members of the same versus opposite sex were statistically significant, except two positive-affect situations (Friend and Like). For three neutral- or negative-affect situations (Fear, Group Strangers, Group Fear) greater distances were shown with members of the same sex. These sex-of-object differences, however, also interacted significantly with sex (see below), so that the schema of greater physical distance toward same-sexed peers in these conditions is not found equally in both sexes. It is, rather, a pattern for males.

For the five other significant sex-of-object main effects, more space was used with members of the opposite sex. For four of these variables (Acquaintance, Stranger, Neutral, Group Friends), sex of object also interacted significantly with grade. In effect, the greater distances maintained toward the opposite sex under these four positive- and neutral-affect situations primarily represent schemata of younger children, while older children show closer proximity to the opposite sex. The remaining stimulus situation in which more distance was maintained toward the opposite sex, Dislike, did not interact with grade or sex.

Sex × sex of object.—Four interaction effects involving neutral- and negative-affect situations (Stranger, Fear, Group Strangers, Group Fear) were statistically significant. As mentioned above, three interaction effects (Fear, Group Strangers, Group Fear) indicated that in predominantly negative-affect conditions there is a schema for males to maintain smaller distances from opposite-sexed peers, while females maintain approximately the same distances toward both sexes. The remaining interaction effect, for Stranger, was due to the large distance used by females with the opposite sex. The sex-of-object differences reported above for these four variables were due to these interactions with sex (with Stranger also interacting with grade). It was concluded that there is a strong schema for females to maintain greater spatial distance than males in neutral- or negative-affect situations involving the opposite sex.

Grade × sex of object.—Six of these interaction effects were statistically significant, and these were all positive- or neutral-affect situations (Friend, Acquaintance, Stranger, Like, Neutral, Group Friends). The consistent
The schema of closer spatial distance with same-sexed rather than opposite-sexed peers at earlier ages appears to be related to a developmental process to some extent. Inspection of the same-sexed mean scores for the six interactions described above indicates that the smallest distances typically occur in third, fifth, and ninth grades for males and in third and sixth grades for females. The small distances maintained by males in ninth grade are largely accounted for by the overall tendency for Ss to use less space as they grow older. Similarly, the close distances set by third graders for Like and Group Friends appear to be related to the finding that younger children use less space than older children under these conditions. Aside from these trends, the close same-sex proximity in fifth or sixth grade appears to reflect schemata of preadolescents who, as articulated by Sullivan (1940), are involved in love relationships with same-sexed chums. The results for Friend especially point in the direction of significant same-sexed intimacy for fifth-grade males and for sixth-grade females, that is, during the developmental stage of preadolescence.
**CHILD DEVELOPMENT**

**Triple interactions.**—Four of these interaction effects were statistically significant, predominantly for positive-affect conditions (Friend, Acquaintance, Like, Group Friends). Though the complexity of the interactions makes them somewhat difficult to interpret, they appear to suggest that the grade by sex-of-object interaction described above is especially pronounced for males. Males appear to be initially (grades 3 through 5) inclined to use more space than females with the opposite sex and the same amount of space as females with the same sex. In later grades (9 and 10), they employ less distance than females with the opposite sex and more distance than females with same sex.

**Summary of findings.**—The spatial schemata found to apply across grade level were that females use more space than males (a) in negative-affect conditions with both sexes, and (b) in neutral- or negative-affect situations with the opposite sex. The developmental patterns obtained were (a) children generally use less space as they grow older, (b) the exception to this is that children use more space as they grow older with same-sexed peers under positive-affect conditions, (c) in situations in which males are initially inclined to greater distance, they rather quickly (by sixth grade) adopt the attitude of closer spatial proximity, (d) in positive- and neutral-affect situations both males and females place themselves closer to same-sexed peers in earlier grades and to opposite-sexed peers in later grades, (e) this last pattern appears to be more marked in males than in females, (f) the pattern occurs at earlier or later ages as a function of degree of liking and acquaintance, and (g) there were suggestions that preadolescence is a period of same-sexed intimacy.

**DISCUSSION**

The developmental findings that children use less space as they grow older and that the shift to closer proximity to the opposite sex occurs about grade 6 or 7 are in general agreement with knowledge about social development. That is, as children grow older they become more adept and comfortable in social situations and manifest increased heterosexual interest. The development of the heterosexual orientation reflected in the spatial settings for situations involving positive affect seems to be influenced by two factors. First, there appears to be a temporary intensification of intimacy or spatial closeness among preadolescent same-sexed peers. Second, in these positive-affect situations, children show a developmental pattern of increasing spatial distances with same-sexed peers, especially following the preadolescent period, as well as decreasing distances with the opposite sex. With reference to the socialization process, this latter finding indicates that the development of the cultural norm for spatial usage during intimate interactions requires changes in children's schemata toward both sexes.
The greater distances employed with same-sexed peers may reflect efforts to cope with unacceptable homoerotic feelings (Blos 1962).

The sex differences replicate Guardo’s (1969) results and are in accord with findings about the sex-appropriate behaviors and attitudes that develop during the process of sex-role identification. Briefly, these findings point out that in overt behavior males are more aggressive, while females are more dependent and passive. In attitude, similarly, males are aggressive when under attack and sexually assertive, while females control aggression and passively attract the male (Kagan 1964). In spatial schemata, the greater aggressiveness of males is manifested by the use of smaller spatial distances than females in negative-affect situations, such as those involving fear, and is underscored by the finding that males quickly adopt an attitude of closer physical proximity than females (even if they initially used greater distances). The notion of greater male assertiveness and female passivity in heterosexual interaction is supported by the significant triple interaction effects, which indicate that in positive-affect situations female schemata entail greater distances with the opposite sex than those of males. Similar findings were reported in a study which compared distances used by college students in approaching strangers (other students) of the same and opposite sex (Dosey & Meisels 1969).

REFERENCES


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