

Density, Location, and Longitudinal Effects on Social Behavior in Two Four-Year-Old Groups of Korean Preschool Children*

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Parten's categories were used in the observation of the social behavior of two 4-year-old groups in a Korean nursery school setting. Results were analyzed with the ANOVA. Longitudinal effects showed that unoccupied behavior decreased, and onlooker and cooperative play increased over a 6 month period of time. Children exhibited more cooperative play outdoors than indoors, but this difference was significant only for children who had a high density indoor play space. Children with a low density indoor playroom played cooperatively both indoors and outdoors. While there were no significant differences between the two groups in the spring semester when both groups had conditions of high density, in the fall semester the low density group exhibited significantly more cooperative play indoors than the high density group. The importance of adequate indoor and outdoor play space was highlighted by the difference in social behavior between the two same-age groups.

Children are developing and learning patterns of social interaction throughout their childhood. The importance of play with peers for social development was emphasized by Hartup (1970; 1978). He observed that effects of early experience may be long lasting, affecting social behavior even in adulthood.

In her pioneer study of social participation, Parten (1932) used the time sampling observational method to assess behavior in six categories of peer interaction: unoccupied behavior (U), solitary play (S), onlooker behavior (O), parallel play (P), associative play (A), and cooperative

play (C). Definitions of these categories may also be found in Tieszen (1979), Cho (1977), and Chu (1979). Although Parten found a strong tendency towards parallel play at all age levels, she emphasized the .61 correlation between age of child and development towards mostly cooperative play in preschool children. She stated that, "As a rule, the youngest children either play alone (S) or in parallel groups (P), while the oldest individuals play in the more highly organized groups (A and C)" (Parten 1932 p. 268).

Parten's study had a tremendous impact on students of children's behavior, who for decades believed that her results held true for all children. Furthermore, practitioners frequently assumed that Parten's categories of essentially non-social behavior (U, S, and O) represented immature forms of behavior and the remaining three

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categories (P,A, and C) represented more mature forms of social behavior. Beginning with Barnes (1971), however, a number of replication studies were reported in the literature. While the categories used in research were similar to Parten's, her results were not always confirmed. Barnes' sample engaged in significantly less social play than the children in Parten's study. He attributed this phenomenon to cultural differences due to the lapse of time (about forty years) between the two studies (Barnes 1971). While the findings of Rubin and his associates were somewhat more similar to Parten's, they discovered socio-economic differences in social play. That is, middleclass preschoolers were more likely to engage in associative and cooperative play and lower-class children were more likely to exhibit parallel play (Rubin, Maioni, and Hornung 1976). Moore, Evertson, and Brophy (1974) found that children engaged in constructive behavior during solitary play, calling into question the assumption that solitary play is immature behavior. Smith (1978), however, considers that even though children may play constructively during solitary play, it may still be immature behavior in terms of social interaction. Furthermore, in his longitudinal research, Smith (1978) found that not all children go through the same sequence: some children for instance, move from the non-social categories to parallel play and then on to associative and cooperative play, but others move directly from solitary play to integrated group play (A and C). This suggests that solitary play may be more essential to integrated group play than parallel play. Both Smith (1978) and Rubin, Watson, and Jamber (1978) suggest that parallel play may be a more immature form of social interaction than solitary play. Tieszen's finding that children engage in more unoccupied and onlooker behavior early in the school year and more associative and cooperative play later in

the year suggests that familiarity with setting may be a factor in preschool children's social behavior (Tieszen 1980). This is similar to the findings of Doyle, Connolly, and Rivest (1980).

The importance of the setting gains added cogency from the results of the author's previous research where it was found that while parallel play was predominant at all age levels in the *indoor* play space, cooperative play surpassed parallel play for 5-year-olds in the *outdoor* play space (Tieszen 1980). This finding could be interpreted in two ways: there could be something in the outdoor environment which promoted cooperative play or there could be something in the indoor environment which inhibited cooperative group activity. Since the indoor play space was below recommended standards, the density factor is a likely candidate as an explanation for this finding.

While it is certainly not the only factor in the development of children's social behavior, educators have long emphasized the importance of the physical setting. Seefeldt reviews the historical emphasis on the play setting and also gives her own point-of-view, "... (T)he environment undeniably controls, either directly or indirectly, many of the teacher's and children's behaviors, action, and interactions" (Seefeldt 1980, p. 100).

In an extensive review of the literature on the school as a social setting, Gump describes three aspects of the environment—the physical milieu, human components, and program. Regarding the physical milieu he states, "The school life of children is associated with the inanimate factors of the school arena: the building, playground, furniture, opportunities for privacy and other sources of physical input" (Gump 1980, p. 55-56). Not only the amount of physical space per se, but the amount of space in relation to other behavior resources, such as the availability of play materials, affects chil-

dren's social behavior (Smith 1974).

Limited space with too many children (a high density condition) was reported by Cannon (1966) to result in less pro-social and more aggressive behaviors among children. The United States Federal Interagency Day Care Requirements quoted by Seefeldt (1980, p.105) for indoor play are thirty-five square feet (3.22m^2) per child but some educators (Hymes, 1974) believe that forty to fifty square feet ($3.68\sim 4.6\text{m}^2$) is more desirable. Recommended outdoor space varies from seventy-five square feet (6.9m^2) to one hundred and even two hundred square feet (9.2 and 18.4m^2) per child (Seefeldt 1980, p.119; and 1974, p.93).

The present study is a continuation of the research reported in Tieszen (1979, 1980). It is both a longitudinal and cross-sectional investigation of the development of social behaviors during free play in two groups of 4-year-olds using the same indoor and outdoor play settings. Density was varied in the indoor environment.

In the longitudinal analysis, it was expected that age-related differences would be found in the two groups as a whole between the spring and fall semesters. In this age-related analysis, it was expected that while parallel play remained about the same, more associative and cooperative play and less unoccupied, solitary, and onlooker behavior would be found in both groups in the second semester compared with the first semester.

Based on her previous findings (Tieszen 1979, 1980), the present author expected girls to engage in more unoccupied and parallel behavior and boys to engage in more solitary and cooperative play than the opposite sex, respectively. Also in keeping with the author's previous research, it was expected that both groups of boys and girls would display more cooperative play outdoors than indoors (Tieszen 1980).

In the second semester, density was varied in the *indoor* environment. The morning group

experienced high density (low square meters per child) while the afternoon group experienced low density (high number of square meters per child). It was expected that children in the high density condition would exhibit less cooperative play and more parallel play than their same-age counterparts playing in a more generous space-per-child indoor environment.

Since the outdoor play space was well over recommended minimum space requirements for both groups, no significant differences were expected between the groups in the out-of-doors. Significant differences were expected, however, between indoor and outdoor play for group H (high indoor density) whereas no significant differences between indoor and outdoor play were expected for group L (low density indoor environment).

Method

Subjects and Play Space

Two groups of 4-year-old children were the subjects of this study. They were the same middle and upper middle class four-year-olds reported in Tieszen (1979). At that time (the first semester of the school year), there were no significant differences in social behavior between the two same-age groups. During the summer of 1979, the indoor playroom was enlarged from 63.8m^2 to 72.73m^2 (from 686 sq ft to 783 sq ft). Furthermore, the creation of a separate playroom for 5-year-olds enabled the afternoon group to use the playroom without sharing the space with another group, but the morning group shared the indoor playroom with a group of 3-year-olds. Thus, two density conditions of high contrast were created, the high density group (H) and the low density group (L).

Table 1 provides a summary of the age, room assignments, and density conditions of the two groups of children. In the spring, at the be-

Table 1. Subjects and Playroom Assignments

Group	AM/PM	Boys		Girls		Total		Space Shared With	m ² per Child
		N*	Age**	N	Age	N	Age		
First Semester (Indoor Space 63.8m ²)									
H	PM	7 (7)	4-6	5(5)	4-7	12(12)	4-6	20, 5-yr-olds	1.99
L	AM	11(11)	4-8	7(7)	4-8	18(18)	4-8	13, 3-yr-olds	2.06
Second Semester (Indoor Space 72.73m ²)									
H	AM	7 (7)	5-0	4(5)	5-0	11(12)	5-0	16, 3-yr-olds	2.35
L	PM	9(10)	5-2	5(8)	5-3	14(18)	5-2	No other group	4.04

* N in parentheses represents total enrollment for that category.

** Age represents mean years-months for target group for that category.

H=High Density Group; L=low density group

ginning of the school year, Group H was an average of 4-6 (4 year, 6 months). They met in the afternoon and shared the playroom with 20 five-year-olds (1.99m² or 21.4 sq ft per child). In the same semester, Group L was a morning group with an average age of 4-8. They shared the same playroom with 13 three-year-olds for an average 2.06m² (22.2 sq ft) per child. Thus, the children were in conditions of similar density at the beginning of the school year.

There was some turnover in enrollment between the first and second semesters, but only the children who stayed with the initial group were included in the study during the second semester. During the second semester, Group H met in the morning and shared the enlarged play space with 16 three year olds (2.35m² or 25.3 sq ft per child) while Group L met in the afternoon without sharing the space with any other group (4.04m² or 43.5 sq ft per child). Both groups were an average 6 months older when the second semester observations were begun: 5-0 for Group H and 5-2 for Group L. A t-test showed that the age difference between the two groups was not significant either in the spring or in the fall semesters.

Each group's head teacher was the same in the spring semester as in the fall. The educational procedure was based on the open educa-

tion model, i.e. the playrooms were equipped with interest centers, such as manipulative materials, housekeeping corner, art center, blocks and wheel toys area, etc. Each child had the option of deciding in which area she would play. The space was well-equipped; see Tieszen (1979) for a more complete list of equipment and materials.

The outdoor play space was a spacious 719m² wooded mountain area, with 23.19m² (249.6 sq ft) per child for Group H, who shared the outdoor area with the three-year-olds. Group L shared the outdoor space with sixteen five-year-olds for an average outdoor space per child of 23.96m². Density in the outdoor space was, thus, similar for both groups and well over the recommended minimum allowance. The outdoor space was equipped with a sand box, including water source and numerous sand box toys, 3 conventional swings, 1 garden swing, and 1 tire swing, 1 jungle gym, a complex climber in the shape of a boat, a good supply of tricycles, and movable boards, fences, and climbers.

Procedure

One minute observations of each child's social participation were made randomly on successive days, using the same modified Parten categories as described in Tieszen (1979). Because mother-child contact was practically non-existent during

the spring semester, it was eliminated from the present study. The remaining categories then were unoccupied behavior (U), solitary play (S), onlooker behavior (O), parallel play (P), associative play (A), cooperative play (C), quarreling (Q), teacher-initiated teacher contact (Tt), and child-initiated teacher contact (Tc). A more complete description of each of these categories may be found in Tieszen (1979).

The observers were the same trained graduate students in both semesters. Inter-observer reliability reached over 90 percent (agreements ÷ agreements + disagreements).

In the first semester, observations had been made only indoors, but in the second semester, observations were made in both the indoor and outdoor play spaces. That is each child was observed daily indoor for one minute and outdoors for one minute. A total of 35 observations for each child in each of the play environments within the first two months of the semester was the target. Inclement weather prohibited outdoor free play from time to time, and absences also made it difficult to reach the target. At the end of the observation period, the range of observations indoors was 34~35 minutes and for outdoors it was 20~22 minutes. Scores were then converted to one minute averages per child. This permitted comparisons between groups and locations.

Results

Two separate comparisons of social behavior were permitted, a longitudinal comparison of indoor free play and a cross-sectional comparison of social behavior in the indoor and outdoor play spaces. The longitudinal analysis consisted of a 4-way ANOVA comparison of first and second semester indoor free play social behaviors [semester (2) × sex (2) × group (2) × social behavior variables (9)]. A main effect was

obtained for social behavior variables ($F=208.180, p<.001$). The 2-way semester × social behavior finding ($F=22.840, p<.100$) indicates that the two groups as a whole changed in the direction of less unoccupied behavior ($F=128.216, p<.001$), more onlooker behavior ($F=24.824, p<.001$), and more cooperative play ($F=14.271, p<.001$). A significant sex × social behavior finding ($F=2.187, p<.05$) was accounted for by solitary play ($F=5.636, p<.05$) where boys engaged in more solitary play than girls. The above differences between semesters of combined groups were interpreted as the effects of age and familiarity with the environment.

Despite similarity in age of the two groups, significant group differences were found in the second semester. These were interpreted as the effect of playroom density. That is, while the 3-way semester × group × social behavior interaction was not significant, an analysis of each social participation category revealed that in the second semester, Group L (low density indoor play environment) engaged in significantly more cooperative play than the high density group ($F=4.162, p<.05$). Figure 1 exhibits

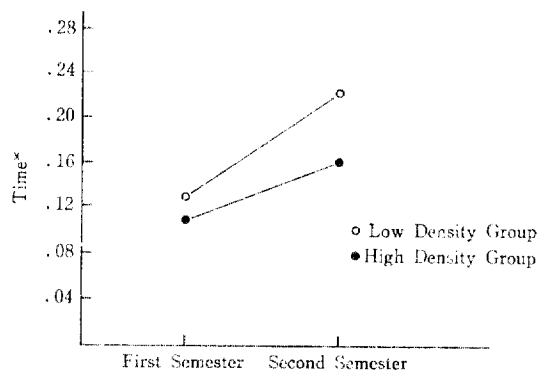


Figure 1. Longitudinal Differences in the Cooperative Play of Children in Two Density Groups
*Average time in minutes of cooperative play indoors

this difference graphically.

A comparison of social behavior in the indoor and outdoor locations during the second semester comprised the second 4-way ANOVA: location (2) \times group (2) \times sex (2) \times social behavior variables (9). A main effect was again obtained for social behavior variables ($F=233.185$, $p<.001$). When each behavior variable was analyzed individually, significant location effects were found with more solitary and cooperative play outdoors ($F=10.071$, $p<.003$; and $F=10.644$, $p<.002$, respectively). Indoors, the children showed more onlooker ($F=11.172$, $p<.002$), parallel ($F=9.291$, $p<.004$), associative ($F=19.084$, $p<.05$), and child-initiated teacher contact ($F=4.62$, $p<.002$).

The location ANOVA also revealed a significant 3-way group \times sex \times social behavior interaction ($F=3.350$, $p<.001$); that is, in Group L girls showed more solitary play than boys. While the 3-way group \times location \times behavior variables was not significant, a closer look revealed a significant interaction for cooperative play ($F=4.106$, $p<.05$); that is, Group L displayed more cooperative play than Group H indoors, and the two groups combined displayed more cooperative social behavior outdoors than indoors.

Location effects studied individually for each group were significant in Group H for onlooker behavior ($F=9.407$, $p<.006$), associative play ($F=14.469$, $p<.001$), cooperative play ($F=24.852$, $p<.001$), and child-initiated teacher contact ($F=7.343$, $p<.05$). That is, Group H children displayed more onlooker, associative, and child-initiated teacher contact indoors and more cooperative play outdoors. Similarly, Group L showed more associative play indoors ($F=6.760$, $p<.05$). Contrary to Group H, however, the low density group showed no significant difference between indoors and outdoors in cooperative play. They exhibited more solitary

play outdoors ($F=7.272$, $p<.05$), and more parallel play indoors than outdoors ($F=6.855$, $p<.015$). This shows quite clearly that the high density group was able to develop cooperative play only in the outdoor location where space was adequate. On the other hand, the low density group with adequate space both indoors and outdoors was able to engage in cooperative play in both locations.

Discussion

Taking first the longitudinal data, this research shows that unoccupied behavior may not only be characteristic of the youngest children as Parten (1932) found, but it may be characteristic of older children as well. Unoccupied behavior may be particularly high when children are unfamiliar with their surroundings and then diminish with increased familiarity. More onlooker behavior and cooperative play with age is in keeping with Parten's hierarchy in which onlooker behavior is one of the steps from less mature to more mature behavior.

The present research found uneven effects for solitary play. In the longitudinal data boys were found to engage in more solitary play than girls in the indoor play space. The cross-sectional indoor/outdoor analysis, however, revealed more solitary play outdoors, and Group L girls exhibited more solitary play than boys. The latter finding is contrary to overall trends. The previously mentioned relationships between solitary play and constructivity (Moore, et al, 1974) and sequences of development (Smith, 1978) suggest that more research may be needed on the place of solitary play in children's social development.

Environmental variables showed that the two groups combined engaged in more solitary and cooperative play outdoors and more onlooker, parallel, and child-initiated teacher contact in-

doors. In keeping with the author's previous research, this suggests that the outdoor environment is more conducive to cooperative play. Solitary play may have been enhanced out-of-doors by the introduction of a large number of tricycles which are generally used alone or in parallel play. The fact that children showed significantly less childinitiated teacher contact outdoors could have more than one explanation. It might show the efficacy of the indoor contacts so that children don't feel the need for additional outdoor teacher contacts, or it could be that self-reliance is enhanced in the wider, more spacious outdoor environment.

The importance of adequate play space per child is emphasized by the finding that same-age children displayed varying patterns of social behavior under different density conditions. In the present study, the children who had adequate indoor AND outdoor space engaged in cooperative play both indoors and outdoors; however children with inadequate indoor space engaged in significantly less cooperative play indoors and continued in mainly parallel play. This is at variance with findings in America, where preschoolers engaged in more aggressive behavior in high density conditions (Cannon, 1966). In keeping with findings in the United States, Smith and Connolly (1972) found that English children engaged in somewhat more aggressive behavior when the play space was diminished considerably. The present study, however, found very little aggressive behavior in either group of children. These findings suggest the possibility that cultural factors may influence children's reactions to density conditions.

Hall (1966) illustrated how interpersonal space varies in different cultures. Yoon (1982) reviewed the theoretical background and methodology in the measurement of personal space behavior. These approaches are promising for future research with young children as well as

adults. Guardo (1969) found that children in her sample had learned to use culturally appropriate dimensions of personal space by the age of 11 or 12.

Stokols (1972, 1976), Choi, Mirajafari, and Weaver (1976), and Baum and Davis (1976) differentiate between the physical condition of density and psychological experience of crowding. Choi, et al. (1976, p.355) have suggested that human beings may have a high degree of adaptability to crowding. Stokols, on the other hand, states that "(t)o the extent that density promotes excessive social stimulation, threatens behavioral freedom, or deplete the supply of local resources, a unique syndrom of crowding stress is predicted" (Stokols 1972, p.60). In the present study, depletion of resources was not a serious question; the play space was well-stocked with materials and toys for child use. It seems rather that density per se was responsible for the differences which were found. Since the Republic of Korea is a densely populated nation (9,600 persons per square kilometer in metropolitan areas), those who are responsible for planning are faced with a serious dilemma. Shall children be given the opportunity to develop optimal social skills in an optimal environment or shall they be trained to fit into an environment of high density with perhaps less than optimal social skills? Such ethical questions are beyond the scope of this paper, but persons who are concerned with policy and with the application of research to real life situations will have to consider the implications if they are to make wise decisions for children.

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