DEVELOPMENT OF SEX DIFFERENCES IN PRESCHOOL CHILDREN: SOCIAL BEHAVIOR DURING AN ACADEMIC YEAR¹

FRANCISCO BRAZA, PALOMA BRAZA,

MARIA ROSARIO CARRERAS, AND JOSÉ MANUEL MUÑOZ

*Estación Biológica de Doñana (CSIC) and
Facultad de Ciencias de la Educación (UCA), Spain*

Summary.—Sex differences in activities of preschoolers were assessed during free-play time from observation of the behavior of 31 children (23 girls, 8 boys; $M = 5$ yr.). These differences were noted for the time girls and boys spent in the activities considered, boys spending more time in rough-and-tumble play and in agonistic activities and girls in organized games such as games with rules and role-play in addition to affiliative activities. Sex differences could be detected also in the distribution of time among various activities of the children during free-play in the three terms of the school year under consideration. From a developmental perspective, gender plays a fundamental role in the formation of play-networks in the first peer encounters. These peer groups, sexually segregated, are structuring and organizing during the academic year, so "distinctive cultures" for boys and girls, besides consolidating this segregation, facilitate the acquisition of advantageous social skill for later life.

The peer groups into which children integrate during the first years of schooling tend to be unisexual, so a tendency towards segregation of girls and boys is apparent in the free-play of preschoolers. This phenomenon of preference during early childhood for same-sexed playmates is present in all cultures and is difficult to change (Maccoby, 1988, 1990; Whiting & Edwards, 1988); this phenomenon has been explained in two ways. From a cognitive-social point of view, the same-sex preferences of preschoolers for playmates have been explained on the basis of their gender labels (Maccoby, 1988). Alternatively, other authors (Whiting & Edwards, 1973; Di Pietro, 1981) have reported sex differences in the styles of play. More recently, the results obtained by Alexander and Hines (1994) also suggest that styles of play have an important role in children's preferences for playmates.

Apart from this, it must not be forgotten that during children's first encounters with their peers integration into play groups is important to the process of social adaptation and general socialization. We agree with Macco-

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by (1988) in that we consider segregation in play networks to be more a group phenomenon than a reflection of the tastes and preferences of individual children. In any case, we assume it is important to incorporate a developmental perspective in the discussion of gender in the relationships among children.

Within the framework at wider study of social adaptation of preschool children (Braza, Braza, Carreras, & Muñoz, 1994) we explored the development of the role of gender in the socialization process of children during their first school year. To do that we examined the activities performed during free-play time by preschool girls and boys integrated into peer groups and how their preferences for these activities develop during the academic year.

METHOD

Subjects

The study was carried out at an elementary school in Cádiz (Southern Spain) from November 1989 to June 1990. It should be noted that there were three distinct periods of analysis, each separated by ten days of holiday. The preschool children, members of a single group ($n=31$; 23 girls and 8 boys; M age = 61.8 mo., $SD=3.8$) were Caucasian. According to family income they could be classified as middle-low socioeconomic class, and most of the parents had completed a primary or middle level of studies. Other characteristics studied in the sample were the number of siblings ($M=2.1$, $SD=1.5$) and previous nursery school experience ($M=1.4$ yr., $SD=0.9$).

Study Area

The study area was an open-air playground of 190 m² containing one fountain for drinking, five trees, four stone benches, two goal nets, one large round basket, and some balls. The study group shared the space with 150 children of up to nine years old without an adult present, although they were watched by teachers situated at the entrance.

Measures

Children were filmed at least twice a week with a video camera (SANYO UMD6P) during the central 15 minutes of the half hour of daily free play at school. Children filmed were unaware of the observers, with permission having been obtained previously from parents and teachers.

Behavior was recorded using focal sampling and continuous recording methods (Martin & Bateson, 1986). The groups filmed were selected at random, and the behavior of each child of the group was analyzed sequentially. To contribute to the independence of the data no group was filmed excessively ($M=49.30$ sec., $SD=31.34$). For this study we have analyzed 587 behavioral sequences during the whole of the academic year.

TABLE 1
BEHAVIORAL PATTERNS CONSIDERED

Behavior	Short Description
Accompany	Simultaneous locomotion side by side.
Adjust	Everyday grooming behavior.
Allow reorientation	S changes his position according to R's reorientation.
Approach	S moves towards R reducing the distance between them.
Argue	Verbal or gestural abuse without physical contact.
Arms round	S encircles R's shoulders, waist or hips with one arm.
Attack	S and R struggle and display several aggressive patterns.
Avoid robbery	S stops R getting something belonging to S.
Call	S beckons R and/or touches R smoothly with his hand.
Cry	S cries and groans.
Feed	S drinks and/or eats.
Follow	S moves behind R.
Fondling	Caressing another child with fingers, hands and/or mouth.
Games with rules	Games with rules and/or turn taking with or without objects.
Games without rules	S and R are engaged in a repeated interaction without rules.
Get object	S obtains or tries to obtain an object by nonaggressive means.
Help	S helps R in some activity.
Hug	S squeezes R or part of him with his arms.
Laugh	S laughs and/or smiles.
Lead	S walks while R/Rs follows him no further than 2 m.
Leave	S moves by any means directly more than 1 m away from R.
Locomotion	Walking, running or jumping a minimum of 1 m.
Look at object	S fixes on an object at is less than 1 m away.
Look in direction	Suddenly, S fixes his eyes on the point R is pointing out.
Lose object	S misses an object that R has taken.
Obey	S performs R's orders.
Offer object	S holds out or gives something to R.
Order	S displays an activity that R performs immediately afterwards.
Point at object	S extends his finger towards something while looking at it.
Receive help	S accepts R's help.
Reorientation	S changes R's position with one or two hands.
Role-play	S and R are engaged in an activity performing a social function.
Rough-tumble play	Playful fighting.
Show	S holds an object which S shows to R, who looks at it.
Smack	S pushes R trying to enlarge their distance.
Solitary play	S plays alone, without any other children near him.
Take object	S removes an object from R's hands.
Talk	R and S engage in a conversation.
Teasing	S alone or in company mocking at R.
Threaten	Threatening gestures or intentional movements of attack.
Try to take object	S tries to remove an object from the grasp of R.
Turn back	S turns his back, showing R partially or totally his back.
Vigilance	S's gaze wanders with shifting of the head.
Watch	S keeps his eyes on someone.

The social patterns considered (Table 1) were based on prior observations (Braza & Braza, 1989). Nevertheless, we previously revised the lists made by other authors, especially studies closely related to the behavior of preschool children (Blurton Jones, 1967, 1971, 1972; Brannigan & Humphries, 1972; McGrew, 1972; Smith & Connolly, 1972).

The analysis and quantification of the behavioral patterns were accomplished with a Philips VR302 video cassette recorder and an IBM compatible personal computer, using custom-designed software based on a personal program written in FoxPro (Microsoft software). To analyze the data a minimum of two authors recorded the behavior of each member of the focus peer group, obtaining an interobserver mean agreement above 90% for all behaviors.

Procedure

Gender differences in time spent on each activity were obtained using a chi-squared test applied to a two-way contingency table, with comparison of the frequency of observations for each activity and the remaining activities of one class of individuals with the corresponding values of another class.

To contrast the frequencies of different patterns of behavior in each period studied, a chi-squared test was applied to a 2×2 contingency table including the frequencies of each activity and the rest of the activities both in the period under study and during the rest of the year.

Results

Within gender preferences towards certain activities shown by the preschool children of our sample, the only statistically significant differences detected are with regard to the time boys and girls spend on activities which can be seen in Fig. 1.

As can be observed in Table 2, amongst the activities most frequently performed by girls (feminine activities), our results indicate that "games with rules" were performed by girls more frequently during the first term than in the other periods, while "role-play" and "games without rules" were performed more during the second term. "Accompany" and "obey" were more performed during the third term.

The leadership and aggressive activities more associated with boys (masculine activities) such as "follow" and "threaten" were performed more frequently by girls in the first term and "solitary play" in the third.

As regards the rest of the activities (neutral), in the first term most time was spent by girls on "feed" and affiliative activities ("help", "receive help", "arms round", and "hug"), while agonistic activities ("take object", "lose object", and "argue") in addition to "watch" and "order" are engaged in more towards the end of the academic year.

It is also interesting to note that in the middle of the course (second

FIG. 1. Percentage of time spent by preschool boys (□) and girls (■) in different activities (* $p < .05$; † $p < .01$; ‡ $p < .001$)

term), the girls were more involved than in any other period in "vigilance," "attack," and "rough-and-tumble play."

Within those activities more frequently performed by boys (masculine activities), "rough-and-tumble play," "smack," and "lead," were performed more frequently during the first term than in the other periods (cf. Table 3); "look at object" was performed more in the second term, while the "teasing," "try to take object," and "turn back" patterns were more frequent in the last term.

Among the activities performed more by boys (feminine activities), these are carried out by boys more frequently in the first term ("games with

rules") and in the second term ("games without rules"). With respect to "neutral activities," boys spent more time on "arms round" in the first term, "point at object" and "look in direction" in the second term, and "locomotion," "feed," "watch," and "argue" activities during the third term.

TABLE 2
RELATIVE FREQUENCIES (%) OF ACTIVITIES ENGAGED BY PRESCHOOL GIRLS FOR THREE TERMS
SHOWING SIGNIFICANCE OF DIFFERENCES IN EACH TERM VERSUS REST OF THE ACADEMIC YEAR

Activities	Term 1	Term 2	Term 3
Feminine			
Accompany	2.7	1.2-	2.7+
Adjust	11.3-	15.8	15.8
Games with rules	6.4+	2.8-	3.7
Games without rules	6.7	6.9+	4.6-
Obeys	0.5	0.1-	1.7+
Offer object	1.3-	2.2	2.4
Role-play	0.0-	1.1+	0.3
Masculine			
Follow	1.6+	1.1	0.5-
Rough and tumble play	0.0-	0.6+	0.2
Solitary play	0.8	0.2-	1.0+
Threaten	0.7+	0.2	0.4
Neutral			
Argue	0.2-	0.6	1.1+
Arms round	2.2+	0.6	0.6-
Attack	0.5	1.1+	0.2-
Avoid robbery	0.0-	0.5	0.7
Call	0.8-	1.6	1.7
Feed	9.4+	6.9	5.8-
Help	0.6+	0.3	0.2
Hug	1.0+	0.6	0.3-
Look in direction	1.1	1.1	0.5-
Lose object	0.0-	0.2	0.8+
Order	0.2	0.2	0.5+
Receive help	0.9+	0.3	0.4
Show	0.0-	0.6	0.4
Take object	0.0-	0.4	0.8+
Vigilance	0.5	0.7+	0.1-
Watch	13.7	13.7	16.8+

Note.—+ and - indicate significantly higher/lower proportion of time than in the rest of the academic year with $p < .05$.

As can be seen in Tables 2 and 3, the proportion of comparisons which reached significance ($p < .05$) was higher than expected at random ($\chi^2_1 = 151.60$, $p < .001$ between sexes, and $\chi^2_1 = 211.32$, $p < .001$ between terms), so there is an evident variation in the frequency of appearance of the behavioral patterns between sexes and terms of school.

TABLE 3
RELATIVE FREQUENCIES (%) OF DIFFERENT ACTIVITIES ENGAGED BY PRESCHOOL BOYS
IN THREE TERMS SHOWING SIGNIFICANCE OF DIFFERENCE BETWEEN TERMS

Activities	Term 1	Term 2	Term 3
Masculine			
Lead	2.6+	1.4	0.7
Look at object	0.7	1.7+	0.0-
Rough and tumble play	4.3+	1.0	0.2-
Smack	4.3+	1.2	1.2
Teasing	1.4	0.5-	2.7+
Try to take object	0.5	1.0	2.2+
Turn back	0.5	0.2	1.9+
Feminine			
Games with rules	2.6+	0.2-	1.0
Games without rules	1.2-	7.8+	3.7
Neutral			
Argue	0.0-	0.5	1.7+
Arms round	2.6+	1.0	1.2
Feed	6.4	2.9-	7.8+
Locomotion	0.7-	3.8	5.1+
Look in direction	0.2-	3.1+	0.2-
Point at object	0.5	1.4+	0.0-
Reorientation	1.9	1.2	0.2-
Watch	13.9	13.5	19.2+

Note.—+ and - indicate significantly higher/lower proportion of time than in the rest of the academic year with $p < .05$.

DISCUSSION

Prior to a discussion of our results, it is important to emphasize that, despite the problems which may derive from the size and nature of the sample, the exploratory nature of this research justifies a discussion with a view to generating new hypotheses for testing on larger samples.

There were certain activities on which both boys and girls spend the same amount of time, and there were others performed more frequently by boys or by girls, though these were not exclusive to either sex. Moreover, our results also suggest that independently of whether the activities may be classified as "masculine," "feminine," or "neutral," both girls and boys appeared to distribute their free-play time in different ways during the different school terms.

The sex differences detected in the performance of the activities observed during free-play time were probably related to the fact that at five years of age, we find the beginnings of sex stereotypes regarding personality (Martin & Little, 1990). Indeed, it has been widely demonstrated that between 2 and 3 years of age, children can correctly label the sex of others as well as their own sex (Cowan & Hoffman, 1986) and that gender constancy is gradually established by 7 years of age (Freixás, 1995).

That girls prefer to spend more time than boys on "role-play," "games with rules," and "games without rules," and boys significantly more time than girls on "rough-and-tumble play" and "teasing" is in concord with the general tendency noted for children 4 to 7 years of age. That is, that girls' play often centres on dramatic play and games (Quay, Weber, & Neel, 1986) and boys show over-all greater physical activity and more frequent noisy, rough-and-tumble play (Smith & Connolly, 1972; Di Pietro, 1981).

Furthermore, the higher percentage of time spent by boys than girls, on agonistic behavior ("threaten," "smack," "try to take object," "turn back," "leave," "cry") and by girls than boys, on behavior such as "offer" and "accompany" confirms the results of McGuire (1973) who stated that boys were considerably more aggressive than girls and also the results of Gervais, Turner, and Hinde (1993) and Maccoby (1990) who showed that girls were more given to nurturing than boys.

The results obtained by Whiting and Edwards (1973) from observation in natural settings of children aged 3 through 11 yr. from various cultures suggest that aggression, especially rough-and-tumble play in boys and touching behavior in girls seems to be the best candidate for biophysical genesis of sex differences. The rest of the "masculine" and "feminine" preferences are particularly malleable through socialization.

In this sense, "rough-and-tumble play," predominantly male behavior, may be an activity related to the developmental origin of sex differences in interaction styles (Maccoby, 1988) and allows boys to be identified as members of their own sex. Given that in the first term boys spend most time on this activity, our results suggest that, since they are aware of their sex by the time they arrive at school, the initial sexual identification is a basis for group categorization. The girls too have an interest in an initial sexual identification with their peers and spend significantly more time during the first term than in the rest of the year in nurturing activities such as "receive help," "help," "arms round," and "hug," and also to "games with rules."

Another result which in turn seems to confirm that the process of identification determines the selection of specific activities during the first term of school is the reduction in the frequency of "rough-and-tumble play" by boys and in "games with rules" by girls from the second term on.

Once both boys and girls become a part of playgroups, in the second term they initiate a process of structuring of their respective groups. Proof of this is that boys in our sample spent more time in probierarchical activities such as "point of object" and "look in direction" in this term. Girls also showed a greater dedication to probierarchical activities in the second term such as "role-play" and "attack." For girls this process of social structuring is slowly established until the end of the academic year, with an increase

seen in time spent on leadership activities such as "order" which are more typical of socially organized groups.

The process of structuring in the same-sex groups favors increasingly the selection of alternative activities which facilitate spatial exploration such as "locomotion" (boys) and "accompany" (girls) in addition to other activities typical of more organized groups which in their turn reinforce sexual differences in behavioral patterns. So, in the third term the girls dedicate more time to "feminine activities" like "obey" which, although it could not be considered a candidate for biophysical genesis of sex differences, is considered an activity typical in style of the girls' social relationships. Boys dedicate more time in the third term to activities typical of masculine social interaction such as "try to take object," "turn back," and "teasing."

These behavioral differences reinforce sexual segregation of the groups which allows the development of distinctive social rules or "cultures," the boys' groups being more concerned with dominance and more hierarchically organized activities than the girls' which appear to be more cooperative (Maccoby, 1988). These "cultures" are probably advantageous to the socialization of boys and girls, as argued by Erwin (1993) who asserted that differences in the models of relationships could be related to different needs in the transition to adulthood.

In conclusion, it is our view that the socialization of children during the first school year consists of three important stages. Similarly, a basic principle of friendship, appeared in the first encounters of the preschool children in our sample to initiate an identification process which allows children to associate with peers most like themselves. In the addition to other relationships (parental, previous friendship, etc.) gender plays a fundamental role in the formation of play-networks. In this sense, Maccoby (1988) already showed that once established the differences between the sexes can become powerful organizers of social function. The second stage would consist in the structuring of sexually segregated groups. Finally, in these already organized groups, boys and girls test social guidelines which consolidate this segregation and facilitate the acquisition of useful social skills for later life.

Research should be undertaken with larger samples of different backgrounds (preschool experience, family background, culture, etc.) with the aim of verifying this hypothesis. In any case, as Erwin (1993) pointed out, since much of children's social interaction revolves around play activities, direct observation of preschoolers' play activities should provide the framework for these studies.

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