

The Stability and Consequences of Young Children's Same-Sex Peer Interactions

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This article addresses whether young children's play-partner choices are stable over time and how these choices influence behavior. Sixty-one children (28 boys and 33 girls; mean age = 53 months) were observed over 6 months, and type of play behavior and sex of play partners were recorded. Children's partner preferences were highly sex differentiated and stable over time, especially when larger aggregates of data were used. Two types of consequences were identified: a binary effect that influenced differences between the sexes and a social dosage effect that influenced variations within the sexes. The binary effect reflected a pattern in which the more both girls and boys played with same-sex partners, the more their behavior became sex differentiated. The social dosage effect reflected a pattern in which variations in levels of same-sex play in the fall contributed significantly to variations in the spring above initial levels of the target behaviors.

One of the most widely recognized social characteristics of childhood is the preference that children show for same-sex play partners (Maccoby & Jacklin, 1987; Ruble & Martin, 1998). At about 30 to 36 months of age, children begin to play with same-sex peers, and these preferences increase across childhood (LaFreniere, Strayer, & Gauthier, 1984; Maccoby & Jacklin, 1987; Powlishta, Serbin, & Moller, 1993; Serbin, Moller, Gulko, Powlishta, & Colburne, 1994). Cross-cultural research also confirms the ubiquity of this sex-segregated pattern of social interaction among children (e.g., Carter, 1987; Omark, Omark, & Edelman, 1975).¹ Sex segregation is more likely to occur in situations that are unstructured and in which children have choices of playmates (Ellis, Rogoff, & Cromer, 1981; Maccoby & Jacklin, 1987; Thorne, 1986).

Although sex segregation has been widely recognized, little is known about its origins (Fabes, 1994; Martin, 1994; Serbin et al., 1994) or about the specific consequences of children's same-sex preferences. Given the large amounts of time that children spend playing in same-sex peer groups, the experiences they have in these groups likely have a major impact on their development (Harris, 1995; Maccoby, 1988, 1998). Moreover, because many aspects of play are different among boys and among girls, the

impact that same-sex peer groups have on boys and girls should be manifested in different ways.

Two major issues are addressed in the present study, both of which have important theoretical and practical implications. The first issue concerns whether children's sex-segregated play is temporally stable. The stability issue provides insights about the origins and maintenance of sex segregation. If children's play is relatively stable, the implication is that individual differences rather than situational factors influence the development and maintenance of play-partner preferences. The second issue concerns the consequences of sex-segregated play for young children's behavior. Does the time that children spend with same-sex peers constitute a major socialization force? Although some speculation has been offered about the consequences of playing with same-sex playmates (Leaper, 1994; Maccoby, 1990, 1998), evidence demonstrating the role of same-sex peers as socializers of children's behavior is lacking. We addressed these issues by conducting a short-term longitudinal study in which we observed children's play partners, assessed the stability of their preferences over two semesters, and examined how play-partner preferences related to changes in children's behavior from the fall to the spring.

Sex Segregation and Children's Development

In the 2nd year of life, girls begin exhibiting preferences for interacting with members of the same sex, and boys soon follow (LaFreniere et al., 1984; Powlishta et al., 1993; Serbin et al., 1994). By 3 to 4 years of age, in preschool settings, the majority of both

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¹ We use the term *sex segregation* to denote that children select others to play with on the basis of the demographic categories of boys and girls. Although there is a continuing debate about the uses of the terms *sex* and *gender*, with some scholars preferring to use *sex* to refer to biologically based characteristics and *gender* for socially based characteristics, we do not presume or intend to suggest assumptions about the origins of these behaviors.

boys' and girls' social interactions are with members of the same sex (Fabes, Shepard, Guthrie, & Martin, 1997; Maccoby & Jacklin, 1987). This preference for same-sex peers has been found in both the observed behavior of children (Fabes, 1994) and in self-reports about playmate preferences given by younger children (Martin, Fabes, Evans, & Wyman, 1999) and older children (Bukowski, Gauze, Hoza, & Newcombe, 1993).

By most estimates, over half of all young children's peer interactions involve play with same-sex peers, fewer than 10% of peer interactions involve play with other-sex peers, and the remainder involve children playing with other children of both sexes (Fabes, 1994; LaFreniere et al., 1984; Maccoby & Jacklin, 1987). With age, the proportion of same-sex peer preferences increases, at least through the elementary school years. For example, Maccoby and Jacklin (1987) reported that preschoolers were 3 times as likely to interact with same-sex peers as with other-sex peers, whereas 6 1/2-year-olds interacted with same-sex peers 11 times more often than they interacted with other-sex peers. Classrooms can be structured to change children's play partners. However, even when interventions have successfully increased other-sex play, this pattern has been difficult to maintain (see Leaper, 1994). For example, when teachers provided reinforcement to preschool children who were seen playing with other-sex peers, the amount of cross-sex play increased while the contingency was in effect. However, when the program was discontinued, the children quickly returned to baseline levels of segregated play (Serbin, Tonick, & Sternlanz, 1977).

The fact that children spend so much time playing in same-sex peer groups has led several researchers to argue that boys and girls grow up in different social environments and distinctive peer cultures (e.g., Maccoby, 1990). Moreover, the experiences that boys and girls receive in their segregated peer groups likely contribute to many aspects of their development, and this contribution is likely to be above and beyond any individual differences that led boys and girls to initially select themselves into same-sex peer groups (Maccoby, 1990). Serbin and colleagues (Serbin et al., 1994) suggested that sex segregation affects children's development by channeling their interests and experiences and by limiting the kinds of activities in which they engage. Experiences gained within boys' and girls' same-sex peer groups are likely to foster different behavioral norms and interaction styles. As such, same-sex peer groups represent a potentially powerful context for the socialization of gender-typed behavior (Carter, 1987; Leaper, 1994; Maccoby, 1998).

Research Issue 1:

Assessing the Stability of Sex Segregation

One key to understanding sex segregation is to discover whether play with same-sex playmates is a stable characteristic of children or whether segregation is highly variable (Maccoby, 1988; Powlishta et al., 1993). Although many children frequently play with same-sex peers, there is variation in the degree to which they do so. If the degree of sex segregation is driven by stable individual characteristics of children, then researchers should focus attention on delineating the characteristics of children that influence their tendencies to segregate by sex. For example, one explanation for sex segregation is behavioral compatibility among children; for

instance, boys who are very active may seek out other children who are active, presumably boys. Similarly, boys who like sports may be more likely than other boys to seek out same-sex peers; girls who are gentle and cooperative may show enhanced preferences for same-sex play relative to other girls (see Fabes, 1994; Serbin et al., 1994).

In contrast, if children's peer preferences are guided by social situational factors, the tendency to segregate by sex is likely to vary considerably over time and situation. Observers on a playground might notice a general tendency toward sex segregation for the group as a whole, but the children involved in sex-segregated play might change from day to day and situation to situation. Children may realize that there are some situations in which it is "okay" or "not okay" for them to play with other-sex children and then vary their behavior according to those situational constraints (Maccoby, 1998). Thus, different activity settings and goals may suggest specific "rules" about the appropriateness of playing with girls and boys (Sroufe, Bennett, Englund, Urban, & Shulman, 1993).

The most clearly articulated stance regarding the stability issue has been proposed by Maccoby (1998). On the basis of data from the Stanford Longitudinal Study (see Maccoby & Jacklin, 1987), Maccoby reported that children's sex segregation is very strong, such that by age 6, same-sex playmate preferences are virtually dichotomous. Variations within this strong binary pattern are assumed by Maccoby to be unimportant and unstable. That is, children may show strong patterns of same-sex play, but the individual variation among children, all with moderate to high levels of same-sex play, is relatively unimportant. Maccoby suggested that the research focus should be on understanding the factors that drive this strongly dimorphic pattern of play—boys playing with boys and girls with girls—rather than on individual differences in the degree to which children play with same-sex partners.

Maccoby's argument is based, in part, on the belief that sex segregation is not a stable feature of individual children's play. Thus, understanding whether play-partner preferences are stable is central for directing research efforts on causal factors. If partner preferences are stable, then we can focus on factors that most likely result in stable play preferences, such as children's personalities, play styles, and the amount of sex-typing pressure placed on children. If preferences are not stable, then efforts should focus on identifying causal factors that vary over situations and that vary for the two sexes but are uniform within each sex (Maccoby, 1998). Researchers could begin to identify the types of situations that promote or discourage sex-segregated play. Also, it would be important to identify the forces that exert pressure on the entire category of males or females, that is, forces that are essentially binary in nature. Binary forces include some biological factors, such as hormone exposure and physiological responses; socialization pressures to dress the sexes differently; and gender cognitions about being a girl versus being a boy (Maccoby, 1998; see also Fabes, 1994; Martin, 1994).

Very young children show stability in their friendship choices (Howes, 1988; Howes & Phillipsen, 1992). Evidence concerning the stability of children's broader play-partner preferences is mixed, however, especially for young children. Maccoby and Jacklin (1987) investigated the stability issue and some of the potential correlates of sex segregation in preschool and older

children. Children were observed indoors and outdoors six times during the day. A week later, an identical set of observations was collected on a subsample of the children. Little evidence of stability in sex of play-partner preference was found from one week to the next. While investigating possible antecedents of same-sex play, Maccoby and Jacklin tested the hypothesis that the stability in girls' play may be due to more feminine girls choosing to segregate whereas more masculine girls may be more likely to play with boys. Their results showed no support for these hypotheses. Instead, the results suggested that girls who were more assertive were more likely than less assertive girls to play with girls. This pattern of findings led Maccoby and Jacklin to suggest that sex segregation may not be due to individual characteristics of children.

A few other researchers have examined the stability of children's playmate choices using small numbers of observations of their behavior. Lloyd and Duveen (1992) assessed the stability of play-partner preferences in two British schools with children ranging in age from about 4 to 7 years of age. Over the course of two terms, at least eight observations were made of each child's behavior. When the proportion of same-sex play was correlated from one term to the next, the correlation was moderate and significant ($r = .40$). On the basis of these results, Lloyd and Duveen (1992) concluded that "it is impossible to predict with any certainty what a child's summer-term rating would be from her or his autumn-term rating" (p. 89). Similarly, Turner, Gervai, and Hinde (1993) examined the short-term stability of children's "nearest neighbors" in play in preschool children from the United Kingdom and Hungary. When same-sex preference scores were calculated over observation sessions (Observations 1-4 vs. 5-8), correlation coefficients were moderate to high in the children from the United Kingdom and moderate (for girls) to low (for boys) in the Hungarian sample.

The stability of sex segregation among younger children has also been assessed with the use of a relatively long time frame for observations and with many more observations. Powlishta and colleagues (Powlishta et al., 1993) videotaped children from 2 to 3 years of age twice a week for several months. Girls showed higher levels of segregation than boys. When data from each child's odd-numbered observation days were correlated with data from even-numbered observation days, boys showed stability in playing with same-sex children but girls did not (Powlishta et al., 1993).

In the present study, our goal was to investigate the stability of children's play-partner preferences using a relatively long time period (two school terms) and many short observations of children's peer interactions. Several methods of assessing stability were compared, including split-half reliability and data aggregation methods in which data were combined over different amounts of time. Data aggregation methods should be particularly useful in assessing whether the amount of observational data influences the likelihood of finding stability in sex segregation. Data aggregation methods have proved useful in investigating the stability of many aspects of behavior over time (Epstein, 1979, 1980; Rushton, Brainerd, & Pressley, 1983; Zajonc & Mullally, 1997). We predicted that the use of data aggregation methods and a larger number of observations would reveal considerably strong stability in young children's same-sex peer preferences.

Research Issue 2:

Boys' and Girls' Peers as Socialization Forces

Once we examined the stability of sex segregation, we turned our attention to the second research issue, namely, the consequences of these same-sex peer preferences. To understand the likely consequences of same-sex play for girls and boys, we must first consider the play qualities of girls' and boys' play. Boys tend to play in more public places with less proximity to and less supervision from adults than do girls (DiPietro, 1981; Lever, 1976; Smith & Inder, 1993). Boys' play also tends to be rougher than that of girls and more often involves physical contact, fighting, and taunting (Maccoby, 1990). Boys quickly establish a hierarchical pecking order, and this order tends to remain stable over time (Maccoby & Jacklin, 1987). In contrast, dominance hierarchies in girls are less stable. Girls' groups emphasize cooperation among play partners and use enabling forms of communication to promote group harmony (Maccoby, 1990). Compared with boys' groups, girls' groups are more likely to select activities that are adult structured and that are governed by strict social rules (Leaper, 1994; Smith & Inder, 1993). Girls are more likely than boys to engage in social alienation in which they exclude others from their social groups and make use of negative gossip about others (Cairns, Cairns, Neckerman, Ferguson, & Garipey, 1989; Crick & Grotpeter, 1995). These differences in the qualities of boys' and girls' same-sex peer interactions are so marked that they are often described as reflecting "separate subcultures" (Maccoby, 1990; Thorne & Luria, 1986). Over time, exposure to these different behaviors and interaction styles may promote the development of different skills, behaviors, and learning styles (Huston & Carpenter, 1985; Leaper, 1994; Maccoby, 1990; Thorne & Luria, 1986).

An example of the differing trajectories of development that are proposed for boys and girls on the basis of their peer experiences involves opportunities for structured and unstructured play (Carpenter, Huston, & Holt, 1986). The nature of boys' interactions allows them more opportunities to engage in low-structured activities that are initiated by the peer group, whereas girls engage in more structured, adult-oriented interactions. Because interactions in girls' groups are more adult oriented and adult structured than those in boys' groups, girls are provided with more opportunities than boys are for following adults' rules and for seeking adult intervention, recognition, and approval. These characteristics elicit greater socialization pressures for girls from adults for compliance and avoidance of getting into trouble (Chung & Asher, 1996).

In contrast to girls' groups, the unstructured activities and less supervised interactions among boys are likely to be associated with more active, heavy-handed, and dominance-oriented interaction styles and with more physically assertive behaviors. This association is due in part to boys' play being more peer directed than adult directed. The relative absence of adult structure and supervision leaves boys to generate their own rules and standards for appropriate behavior (Carpenter et al., 1986). In extreme forms, exposure to other boys can increase the risk of some boys developing behavior problems and antisocial interactional styles (Fabes et al., 1997). Moreover, the influence of these early experiences may continue for years. The gendered scripts and behavioral repertoires that children learn may carry over in some form into their adult lives in their romantic relationships, workplace interactions, and parenting roles (see Maccoby, 1998).

Much speculation has been offered about the importance of the different subcultures that peers offer girls and boys, largely based on the play qualities exhibited by girls and by boys (Harris, 1995; Leaper, 1994; Maccoby, 1998). Although some researchers (e.g., Fagot, 1977) have identified mechanisms that influence children's behavior, such as differential reinforcement and modeling, direct evidence regarding the links between early peer experiences and later behavior is limited. In addition, we do not know whether there is a threshold for peer socialization effects, that is, whether even a relatively low amount of exposure to one sex ensures socialization by that group or whether the effects vary depending on exposure. As noted earlier, Maccoby (1998) proposed a binary view of peer socialization in which each sex is socialized by same-sex peers and only a low threshold of exposure is needed to learn the norms and styles of one's own-sex group. Thus, individual differences in exposure to same-sex peers are considered to be relatively unimportant. We propose a gradient view in which same-sex peer effects are "dosage dependent"—that is, the more exposure a child has to same-sex peers, the more the child will show the influence of these experiences.

To examine these issues, we used data from the same short-term longitudinal study used for Research Question 1, in which children's behaviors, emotions, and peer preferences were observed in the course of their everyday activities over two terms (6.5 months). Children's behaviors and their tendencies to play with same-sex partners were examined during the fall semester and then examined in relation to their naturally occurring behaviors and emotions during the following spring semester. To ensure that the effects of peer experiences were considered separately from individual differences in these characteristics, we controlled for individual differences in children's initial behavioral and emotional tendencies. We did this by assessing the relation of same-sex play during the fall semester to observed behaviors and emotions in the spring after controlling for the amount of variance accounted for by the target characteristic during the previous fall semester. In this way, we could examine the relation of same-sex exposure to subsequent behaviors and emotions above and beyond individual differences in those behaviors and emotions.

For the behaviors that were characteristic of play in girls' groups (e.g., playing near adults) or play in boys' groups (e.g., rough-and-tumble play), we expected to find that experience in same-sex peer groups would influence children's subsequent behavior. The general pattern we expected to find was one of increased sex differentiation in the behavior of girls and boys over time. Specifically, we expected that boys' same-sex interactions would socialize them to be more physical in their play and more aggressive, active, and independent from adults than girls. We expected that girls' same-sex interactions would socialize them to be less physically active and more dependent on adults than were boys.

Two patterns of sex differentiation were examined. One is a *dual polarization* pattern, that is, a pattern in which both girls and boys move away from their starting points but in opposite directions. The dual polarization pattern is characterized by increasing sex differentiation as the behavior of each sex becomes increasingly different over time from its original starting point. This pattern suggests that the interactions and activities among members of one sex are actively fostering and/or encouraging a behavior while the interactions and activities among members of the other sex are actively inhibiting and/or discouraging the same

behavior. Another possibility is that some behavior might show a *singular polarization* pattern in which the behavior of only one sex changes over time while the behavior of the other sex stays relatively the same. In this case, sex differentiation also is increasing over time, but the change is accounted for by the movement of only one sex from its initial position. Although we were uncertain whether singular or dual polarization patterns would be apparent, we expected some type of sex differentiation to occur for the behaviors we examined.

Increasing sex differentiation over time may also be evident in children's tendencies to engage in gender-typed play activities. Because peers encourage one another to engage in gender-typed activities and avoid cross-sex activities (Fagot, 1977), we expected levels of gender-typed play to increase as children gained more experience in playing with same-sex peers.

Children's positive and negative emotions associated with peer interaction were also examined. Although little research has been conducted on the emotional aspects of peer interactions, we expected that experience with same-sex peers would increase positive emotionality and decrease negative emotionality. Over time, we predicted that these gender-differentiated behavioral patterns and emotional displays should become more evident because of the cumulative socializing influences of the peer group.

The extent of dosage-related effects of same-sex play can also be described by considering dual or singular polarization. Specifically, we expected that if same-sex peers provide different socialization experiences for girls and boys, then children who have more of these experiences would show greater changes over time in their behavior than would children who have fewer same-sex experiences. Dual polarization effects would be evident when individual differences in levels of exposure to peers relate to changing behavior over time in both sexes. Singular polarization effects of same-sex exposure would be evident when individual differences in levels of exposure relate to changing behavior over time in only one group. In both cases, the exposure effect may be either to exaggerate or to suppress behavior relative to the behavior of children with less same-sex peer exposure.

Method

Participants

Participants were 61 children (28 boys and 33 girls) enrolled in three preschool or kindergarten classes at a university day-care facility located in a large urban area of the southwestern United States. Boys' and girls' mean ages were 52.6 months ($SD = 11.4$; range = 39–74 months) and 52.5 months ($SD = 9.03$; range = 41 to 71 months), respectively, figured midway through data collection. The children were mostly Caucasian (84%), with the remainder being Asian (7%), Black (3.5%), Hispanic (3.5%), or of mixed ethnic origin (1.8%). The majority of children were from middle- to upper-middle-class families, with 70% of the children living in two-parent households with an average family income of \$62,000. For some analyses, we divided children into younger (mean age = 44 months) and older (mean age = 66 months) groups using a median split on age.

Procedure

As part of a larger investigation, observational measures and ratings were collected for each child during two consecutive academic semesters (hereinafter labeled Time 1 and Time 2, or T1 and T2). Brief observations

of children's behaviors took place every weekday for 6 months. These "scan" observations (Mize & Ladd, 1988) of children's naturally occurring play behavior were conducted during children's indoor and outdoor unstructured play time. The only times in which children's behavior was not coded were nap time and teacher-directed circle times, when children had no choice in their play partners. Nine female observers at T1 and 12 female observers at T2 rotated through a randomly ordered list of children and observed each child briefly (for 10 s). After completing the observations on one class, observers either moved to another available class or waited 15 min before cycling through the same class of children again. During each 10-s observation period, a variety of behaviors were recorded for each target child (see below). Observers were unaware of the hypotheses to be tested.

A total of 19,382 observations were collected over the course of the 6.5 months (7,737 at T1 and 11,645 at T2). The mean numbers of observations for boys were 125.33 at T1 ($SD = 34.45$; range = 55–182) and 185.33 at T2 ($SD = 47.26$; range = 84–243). The mean numbers of observations for girls were 131.94 at T1 ($SD = 31.83$; range = 56–186) and 201.24 at T2 ($SD = 43.67$; range = 91–273). The range in the number of observations recorded for each child was due to differences in absences and availability of the children, and the difference in the number of observations from T1 to T2 was due to the larger observational period for T2 (3.5 months) than for T1 (3 months) and the greater number of observers at T2.

Coding of Observations

For each observation, the coder recorded data on a variety of the target child's behaviors. First, the coder noted whether the child was playing alone, playing with other children, or interacting with an adult. If the child was playing with other children, the coder then noted whether the child was interacting with peers who were of the same sex, of the other sex, or part of a mixed-sex group. Next, the coder noted the type of interaction that was occurring. If the child was engaged in play behavior that involved physical action done in a playful, happy way (e.g., playing chase or tackling another in football), the behavior was coded as *rough-and-tumble play*. *Aggression* was coded if the target child was engaged in a physical or verbal act intended to cause pain, distress, or damage to other children or objects (e.g., hitting, kicking, pushing, teasing, or destroying property). To assess the degree to which children played near adults, the coder also noted whether or not there was an adult nearby (within 5 ft [1.52 m] of the target child). The behavior or activity of the child was coded as *gender typed* if it was gender stereotypic for the sex of the target child (i.e., if a boy was playing with trucks or cars or if a girl was playing dress-up or dolls).

During the 10-s observation, the observer also rated the target child on each of the following characteristics (using a 4-point scale with 1 = *none or extremely low* and 4 = *very high*): *activity level*, which reflected the degree of physical activity exerted by the target child; *positive emotionality*, which reflected the degree of positive emotions expressed; and *negative emotionality*, which reflected the degree of negative emotions expressed.

To determine reliability, two observers occasionally were paired together to independently code the same child's behavior. For 1,937 simultaneously recorded observations (about 10% of all observations—approximately 50 observations per observer), coders agreed on the type of activity and the play-partner categorization in 93% and 96% of the codings, respectively (kappas ranged from .81 to .94). In addition, the interrater correlations for the ratings provided during these reliability assessments ranged from .77 to .91. The reliability estimates were comparable for each of the two semesters.

The proportions of same-sex and other-sex play were calculated differently when assessing stability and when assessing the consequences of same-sex play. To assess stability, we computed the proportions of same- and other-sex play (and proportions of playing with girls and playing with boys) for each child for a given unit of time by dividing, for example, the number of same-sex interactions by the total number of social interactions

with other children observed during that unit of time. Thus, the stability proportions represented the amount of time that a specific type of play occurred out of all the child's peer interactions. We used this method because it is similar to those used by others who have assessed the stability of sex segregation (e.g., Maccoby & Jacklin, 1987; Powlishta et al., 1993). To assess same-sex play for the analysis of consequences, we calculated the proportions using the total number of observations as the denominator.

Results

Research Issue 1: Strength and Stability of Sex Segregation

Strength of sex segregation. To assess the strength of sex segregation, we compared the mean proportions of same-sex and other-sex interaction (out of all peer interactions) across weeks. For both girls and boys, the proportion of peer interactions each child spent with same-sex peers (for girls, $M = .56$, $SD = .13$; for boys, $M = .50$, $SD = .11$) was significantly greater than the proportion spent with other-sex peers (for girls, $M = .12$, $SD = .07$; for boys, $M = .17$, $SD = .10$): $t(59) = 8.52$ for boys and 13.19 for girls, $ps < .001$. Boys spent more time with other-sex peers than did girls, $t(59) = 2.05$, $p < .05$, and girls spent more time with same-sex peers than did boys, $t(59) = -2.10$, $p = .05$.

Another way to assess the strength of sex segregation is to examine the amount of variance accounted for by sex in the proportion of time spent playing with girls and with boys. Regression analyses were conducted using sex as the predictor and play with girls and play with boys (proportion scores) as the outcome variables. Sex accounted for 74% of the variance in the proportion of time spent playing with girls and 81% of the variance in the proportion of time spent playing with boys.

Stability of sex segregation. We used several different methods of examining the stability of sex segregation. The first technique involved a split-half method in which the proportions of children's interactions with same- and other-sex children were divided into even-numbered observation weeks and odd-numbered observation weeks. Children's proportions for the even and odd weeks were calculated and correlated. When the correlations for boys and girls were examined, both groups showed high stability (see Table 1). When we divided children into younger and older groups (by using a median split), similar patterns emerged, suggesting that the stability for children's tendencies to play with both same- and other-sex peers was consistent across the ages of the children in this study.

A second method of assessing stability involved calculating standard deviations representing each child's variability around their own mean level of play with same-sex peers and other-sex peers across each of the 6 months. If sex segregation is stable,

Table 1
Split-Half Correlations of Proportion of Time Spent in Same-Sex and Other-Sex Play

Type of play	For boys	For girls	For younger children	For older children
Same-sex play	.69****	.74****	.73****	.68****
Other-sex play	.82****	.79****	.84****	.76****

**** $p < .001$.

children should show little variability in their month-to-month same-sex play scores. Overall, the mean level of variability was low for playing with same-sex children ($M = .07$) and with other-sex children ($M = .11$). However, a sex difference was apparent in variability: Girls ($M = .09$) and boys ($M = .11$) were similar in the variability of their interactions with same-sex peers, but girls ($M = .21$) were significantly more variable than boys ($M = .07$) in their play with other-sex peers, $t(59) = 8.93$, $p < .001$.

The third method of assessing stability involved data aggregation procedures (Epstein, 1979, 1980). The data were aggregated on the basis of proportions of time spent playing with girls and playing with boys. We then repeated this procedure using proportions of time children played with same-sex and other-sex playmates. Odd-even stability coefficients were calculated by combining observational data across units of time differing in numbers of weeks; units ranged from 1 week to 13 weeks. We combined data over units by obtaining a mean proportion score across the number of weeks in the unit. Using 1-week units, for instance, we correlated the mean proportion score from observational data Week 2 with the Week 3 mean proportion score; Week 4 data were correlated with Week 5 data; and so on. The correlations for each 1-week pairing were averaged to obtain the 1-week stability coefficient.² To obtain a stability coefficient for a 2-week time period, we correlated the average proportion of interactions with same-sex peers aggregated over 2 weeks (Weeks 2 and 4) with the proportion of same-sex play over Weeks 3 and 5, and the average stability coefficient was calculated over all 2-week units.³ This method was continued until the 13-week unit, for which data from all the even weeks were combined and correlated with data from all the odd weeks combined (essentially the odd-even analysis reported earlier). The stability coefficient was the correlation between these two 13-week units.

The stability coefficients for the different units of aggregation are depicted in Figure 1. For both playing with girls and playing with boys, even 1-week data aggregation resulted in moderately high stability coefficients, and the coefficients increased as the number of units increased, reaching asymptote with very high stability at around 8 weeks. From this point, stability coefficients increased only slightly with the inclusion of additional data. For playing with same-sex play partners, stability coefficients were lower to begin with and increased over time to moderately high levels, although not as high as when data were aggregated by sex of play partner. Same-sex stability varied less over time than other-sex stability. The lower stability for same- and other-sex play than for play with boys and play with girls was probably due to the narrower range of scores associated with same- and other-sex play than with play with girls and play with boys.

The advantage of data aggregation is that averaging reduces error of measurement (Epstein, 1979). The extent of this reduction can be seen by examining changes in standard deviations as the number of aggregated units increases for playing with girls and playing with boys. Overall, standard deviations decreased as stability correlations increased for both methods of aggregating the data. For playing with girls and playing with boys, the mean standard deviation of the stability coefficients decreased from .23 when one unit was used to .05 when five and six units were combined. For playing with same-sex peers and other-sex peers,

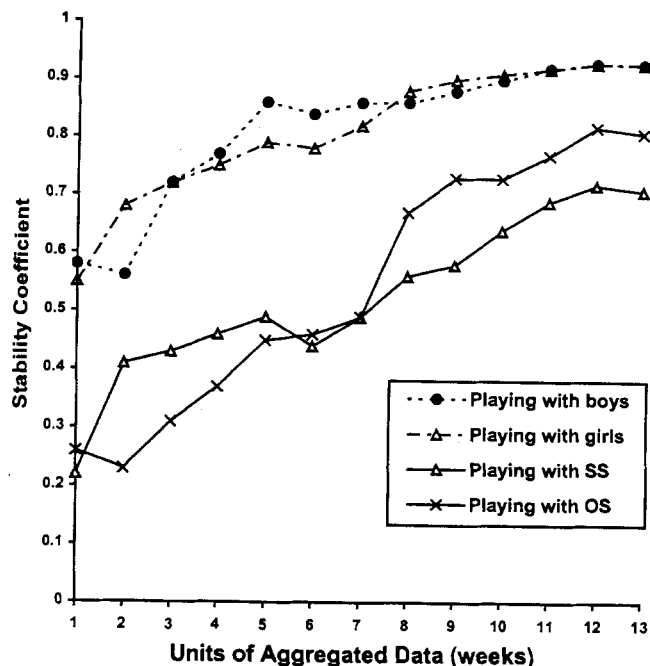


Figure 1. Stability coefficients for playing with boys, playing with girls, playing with same-sex peers (SS), and playing with other-sex peers (OS) as a function of the weeks of aggregated observational data.

the mean standard deviation decreased from .22 with one unit to .05 when five and six units were combined.

The results of the data aggregation suggest that children's tendencies to segregate by sex stabilize relatively quickly. Children's positions relative to those of other children remain roughly constant over time if adequate numbers of observations are obtained.

Individual preferences. The relative proportions of same- and other-sex play were also examined in order to assess specific play-partner preferences for individual children. We examined the percentages of children who evidenced different play patterns by comparing the relative proportions of same-sex and other-sex play for each child.

Over 90% of the girls played with girls more than with boys, and about 45% of the girls played almost exclusively with other girls (i.e., played with boys less than 10% of the time). Only 1 girl had a pattern even marginally close to an other-sex play-partner preference: She interacted with boys from 30% to 40% of the time and with girls somewhat less often (from 20% to 30%). Another girl played with boys slightly less than with girls.

For boys, the sex-segregated pattern was somewhat less (although not much less) extreme than it was for girls. Most of the

² Because rates of interaction were low and few observations were recorded in the 1st week of observation, Week 1 data were not included in the analyses. Similarly, data from the 1st week of coding during the second term were not included in the analyses.

³ Stability coefficients were calculated in this manner for the total sample of children. For the 2-week units, means were calculated by averaging across both weeks if the data were available, but because some children had no other-sex interactions, the mean from 1 week of data was used if necessary.

boys (82%) showed same-sex partner preferences, and of these, about 35% played almost exclusively with boys. Other-sex play-partner preferences are apparent for 3 boys who played more with girls than with boys (11%). Two boys (7%) played with boys slightly more than with girls.

Research Issue 2: Analyzing the Consequences of Sex Segregation

In the next set of analyses, we turned our attention to examining the consequences of sex segregation on children's behavior. To do this, we used a measure of same-sex play that reflected the overall time during each term that a child spent in same-sex play relative to all other play patterns. Thus, for each child, a proportion score was calculated by dividing the number of same-sex interactions by the total number of observations for that child, which was the sum of the numbers of same-sex (child with same-sex peers), other-sex (child with other-sex peers), mixed-sex (child with girls and boys), solitary, and adult interactions. This proportion index reflects a more accurate picture of the cumulative proportion of time spent with same-sex peers than does the index we used to examine stability. For the ratings of activity level and negative and positive emotionality, we computed the mean rating given for a child across all of his or her observations. For aggression, rough-and-tumble play, play near adults, and gender-typed play, we calculated the proportion of total interactions in which each behavior was observed. Thus, the scores represent the proportion of time a target behavior occurred out of all the times the child was observed in each term. In addition, because 1 boy dropped out of school in the middle of spring semester, this boy was not included in the following analyses ($n = 60$).

Dyadic and group play patterns. To assess the composition of children's play groups and play-partner choices, we examined for each type of social interaction the proportion of those interactions in which children played with only 1 other child and in which they

played with a group of children. Roughly half of children's same-sex interactions were dyadic (fall term, $M = .53$; spring term, $M = .51$), and half involved group play (fall term, $M = .47$; spring term, $M = .49$). About two thirds of children's other-sex social interactions involved dyads (fall term, $M = .69$, spring term, $M = .67$), and only about one third involved groups (fall term, $M = .31$; spring term, $M = .33$). No differences were found in boys' and girls' tendencies to engage in dyadic versus group peer interactions.

Correlations with age. Given the rather large age range of the children in our study, we examined the relations between the age of the child and the various study indexes. Age was significantly correlated with gender-typed behavior at T1, $r(58) = .28$, $p < .05$, with rough-and-tumble play at both T1 and T2, $r_s(58) = .27$ and $.30$, $p_s < .05$, and with positive emotionality during T1, $r(58) = .35$, $p < .01$. Although age was not significantly related to the proportion of same-sex play at T1 or T2 for the entire sample, it was at least marginally positively related to the proportion of same-sex play at T1 and T2 for boys (but not girls), $r_s(25) = .47$ and $.33$, $p_s < .01$ and $.10$, respectively. Because of the relations between age and these study indexes, we controlled for age in most of the following analyses.

Changes in play over time. Girls and boys showed similar levels of same-sex, other-sex, and mixed-sex play. The levels of solitary play ranged from .37 for boys to .39 for girls at T1 and from .32 for boys to .30 for girls at T2. Given that increases in sex segregation occur between the ages of 4 and 6 years, we expected increases in sex segregation during the year. For same-sex play, there was a significant main effect for time period: Children were significantly more likely to play with same-sex peers at T2 than at T1, and this increase was similar for both boys and girls, $F(1, 57) = 30.13$, $p < .0001$.

To examine sex differences and changes in the observed and rated behaviors over time, we conducted a 2 (sex) by 2 (T1 vs. T2)

Table 2
Means and Standard Deviations for Study Indexes by Gender and Time Period

Index	Time 1				Time 2			
	Boys		Girls		Boys		Girls	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Same-sex play ^{a,b,c}	.30	.11	.34	.13	.36	.11	.41	.11
Other-sex play ^{a,b}	.11	.06	.07	.05	.11	.07	.08	.04
Mixed-sex play ^{a,b}	.22	.06	.20	.07	.21	.06	.21	.04
Behavioral measures ^b								
Play near adults	.45	.09	.47	.10	.44 _a	.09	.60 _a	.07
Aggression	.008	.01	.006	.01	.009	.01	.007	.01
Rough-and-tumble play ^d	.018	.015	.003	.005	.021	.013	.004	.007
Gender-typed play	.30	.05	.29	.04	.37 _b	.09	.26 _b	.04
Ratings of behavior ^e								
Activity level	2.07 _c	.10	2.01 _c	.13	2.12 _d	.09	2.01 _d	.09
Negative emotionality	1.56	.04	1.57	.06	1.55	.05	1.55	.03
Positive emotionality	2.05	.17	2.01	.11	2.37 _e	.15	2.07 _e	.25

Note. Means with similar subscripts were significantly different at $p < .05$ (at least). $N_s = 27$ boys and 33 girls.
^a Based on the total number of observations (including solitary play and interactions with adults). ^b Proportion score. ^c T1 scores for boys and girls combined < T2 scores, $p < .0001$. ^d Boys > girls across T1 and T2, $p < .0001$. ^e Ranging from 1 (none) to 3 (high).

Table 3
Interrelations Among Study Indexes

Study indexes	Time 1									
	1	2	3	4	5	6	7	8	9	10
Time 1										
1. Same-sex play	—	-.52****	-.11	-.43****	-.22	.03	.32**	.36***	-.28*	.53****
2. Other-sex play		—	-.02	-.11	.23	.15	-.11	.06	.02	-.03
3. Mixed-sex play			—	.27*	.05	-.12	-.14	.31**	-.23	.12
4. Play near adults				—	-.03	.07	-.36***	-.34**	-.32**	-.31**
5. Aggression					—	.09	-.07	.10	.23	-.18
6. Rough-and-tumble play						—	.40***	.27*	-.10	.23
7. Gender-typed play							—	.39***	-.13	.24
8. Activity level								—	-.36***	.53****
9. Negative emotionality									—	-.36***
10. Positive emotionality										—
Time 2										
11. Same-sex play										
12. Other-sex play										
13. Mixed-sex play										
14. Play near adults										
15. Aggression										
16. Rough-and-tumble play										
17. Gender-typed play										
18. Activity level										
19. Negative emotionality										
20. Positive emotionality										

Note. $df = 58$.

* $p < .05$. ** $p < .01$. *** $p < .005$. **** $p < .001$.

repeated measures analysis of covariance (co-varying age) for each of the study indexes listed in Table 2. For the analysis of the degree to which children played near an adult, the main effects of sex and time period were significant, as was the interaction of these two, $F_s(1, 57) = 21.01, 24.13, \text{ and } 32.16$, respectively, $ps < .001$. Simple effects analyses revealed that boys and girls played near adults at similar levels during T1 but that girls significantly increased their tendency to do so during T2 (see Table 2).

No significant main effects or interactions were found for the analysis of aggressive behavior. For rough-and-tumble play, only the main effect of sex was significant, $F(1, 57) = 49.57, p < .0001$: Boys were significantly more likely to be observed in rough-and-tumble play across both time periods than were girls (see Table 2).

For gender-typed play, there were significant main effects for sex and time period and a significant interaction for the two, $F_s(1, 57) = 28.69, 6.34, \text{ and } 32.34, ps < .0001, .05, \text{ and } .0001$, respectively. Simple effects analyses revealed that boys and girls were observed to engage in comparable levels of gender-typed play at T1 but that boys engaged in gender-typed play significantly more often than girls at T2.

For the ratings of activity level, a significant main effect of sex and a significant interaction of sex and time period were found, $F_s(1, 57) = 14.45 \text{ and } 4.18, ps < .0001 \text{ and } .05$, respectively. Boys were rated as significantly more physically active than girls at both T1 and T2, but the differences between them increased because of an increase in physical activity for boys from T1 to T2 while girls remained at similar levels (see Table 2). For positive emotionality, significant effects for sex and time period as well as a significant interaction of the two were found, $F_s(1, 57) = 5.50, 24.29,$

and $19.95, ps < .05, .0001, \text{ and } .0001$, respectively. An examination of Table 2 reveals that although boys' and girls' ratings of positive emotionality were comparable at T1, boys were significantly higher than girls at T2. No effects were found for the analysis of negative emotions.

Interrelations of play-partner interactions and behaviors at T1 and T2. Table 3 presents the interrelations among the various behaviors and play-partner choices during each term. The T1 correlations revealed several interesting patterns. First, as expected, the proportion of interactions involving same-sex play partners was negatively correlated with the proportion of interactions involving other-sex play partners at both time periods. Second, positive relationships were found between children's interactions with same-sex peers and gender-typed play, activity level, and positive emotionality, whereas same-sex play was negatively related to play near adults and negative emotionality. Third, children who were relatively more aggressive were not necessarily high in rough-and-tumble play. The T2 correlations showed many of the same patterns, although some differences were apparent. At T2, the patterns of relations for aggression changed most dramatically. At T1, aggression did not correlate with other behaviors; by T2, aggression correlated positively with rough-and-tumble play, gender-typed play, and activity level and negatively with positive emotionality (see Table 3).

Stability of play-partner interactions and play behaviors from T1 to T2. To assess the stability of play-partner interactions and play behaviors, we examined the correlations between the same variables at T1 and T2 (see Table 3). For both play-partner interactions and behaviors, the patterns were stable over time, with the stability of play partners tending to be higher than the stability

Time 2									
11	12	13	14	15	16	17	18	19	20
.73****	-.57****	.06	.01	-.29*	.18	.30*	.10	-.12	.55****
-.71****	.72****	.19	-.16	.32**	.03	-.12	.07	.15	-.28*
.03	-.03	.34**	-.20	.23	.05	.18	.41****	-.23	.05
-.20	.15	.16	.38***	-.05	-.25*	-.27*	-.13	-.10	-.07
-.32*	.44****	-.01	-.05	.66****	.07	-.23	.19	.17	-.11
-.11	.16	-.13	-.52****	.37***	.74****	.47****	.42****	-.01	-.16
.18	-.09	.02	-.29*	.13	.44****	.57****	.42****	.17	.01
.30*	-.07	-.03	-.30**	.19	.35**	.43****	.65****	.16	.29*
-.17	.27*	-.11	.06	.12	-.14	-.13	-.11	.32**	-.13
.43****	-.03	.04	-.21	.01	.40***	.35**	.30*	-.03	.46****
—	-.71****	-.06	-.09	-.34**	.11	.27*	.11	-.18	.46****
	—	-.01	-.02	.37***	-.01	-.18	.11	.13	-.26*
		—	.15	.08	-.05	.03	.14	-.22	.11
			—	-.12	-.58****	-.35**	-.47****	.01	.38**
				—	.50****	.38***	.54***	.15	-.47****
					—	.56****	.35**	.06	-.20
						—	.61****	.04	-.16
							—	.11	-.06
								—	-.13
									—

of most behaviors except for rough-and-tumble play, for which stability was also quite high. These patterns suggest that the behaviors observed in this study were relatively stable from fall to spring.

Predictions of behavior at T2 from same-sex play at T1. To test the effects of same-sex play on subsequent behavior, we conducted a series of hierarchical regressions for each of the behavioral and rating observation indexes. For each T2 index, we entered children’s age and sex as control variables on the first step. In the second step, we entered the T1 measure of the behavior being predicted. For the third step, the proportion of same-sex play at T1 was entered. For some behaviors (e.g., play near adults, aggression), we expected the pattern of findings to differ for boys and girls. Thus, we entered the multiplicative interaction term of same-sex play and sex of child on the last step. As suggested by Aiken and West (1991), predictors were centered (the group mean was subtracted from each predictor) prior to computing the regression equations for all analyses. Thus, we examined the extent to which play in same-sex peer groups at T1 predicted behavior at T2 above and beyond the prediction from the level of the same behavior at T1 (e.g., we could predict aggression at T2 from same-sex play while controlling for T1 levels of aggression). When we found significant interactions, we performed simple effects analyses by recomputing the analyses separately for boys and girls. These analyses demonstrate whether, for instance, girls who play with same-sex peers relatively more at T1 show a different pattern at T2 than do girls who play with same-sex peers relatively less at T1. A singular polarization effect can be assumed when only one sex shows the influence of same-sex exposure, whereas a dual polarization effect can be assumed when both sexes

show the opposite influence of same-sex exposure. The results of each step in the hierarchical regressions and the simple effects analyses are presented in Table 4, and the results of the simple effects analyses are also summarized in Figure 2.

For the proportion of time boys and girls played near adults at T2, significant predictors were sex, play near adults at T1, and the interaction of sex and same-sex play at T1. Simple effects analyses revealed a dual polarization effect; that is, significant but opposite patterns were found for boys and girls. For boys, a negative relationship was found between same-sex peer exposure at T1 and playing near adults at T2. In contrast, a positive relationship was found for girls between same-sex exposure at T1 and playing near adults at T2 (see Figure 2).

In the analysis of aggressive behavior, we found significant main effects for same-sex play at T1 and sex of child and a significant interaction between them. Simple effects analyses again indicated a dual polarization effect with significant but opposite patterns for boys and girls. For boys, a positive relationship was found between playing with same-sex peers at T1 and observed aggression at T2. In contrast, for girls, a negative relationship was found between playing with other girls at T1 and observed aggression at T2. Importantly, we obtained these findings while controlling for children’s initial (T1) levels of observed aggressive behavior.

Significant main effects for age, sex, T1 behavior, and same-sex play were found in the analysis of T2 rough-and-tumble play (see Table 4). A significant interaction of sex and same-sex play at T1 was also found for the prediction of rough-and-tumble play observed at T2 (see Figure 2). Simple effects analyses revealed a singular polarization effect: There was a significant main effect for

Table 4
Hierarchical Regressions of Time 2 Behaviors

Regression results	Time 2 behavior						
	Play near adults	Aggression	Activity level	Rough-and-tumble play	Gender-typed play	Negative emotionality	Positive emotionality
Step 1							
Age ^a	-.08	.04	-.07	.24*	-.12	.07	.10
Sex ^a	.67****	-.63****	-.56****	-.65****	-.64****	-.07	-.44****
R ² change	.46****	.40****	.32****	.48****	.41****	.01	.16***
Step 2							
Time 1 behavior ^a	.32****	.60****	.54****	.51****	.43****	.35**	.55****
R ² change	.09****	.26****	.27****	.15****	.16****	.12**	.27****
Step 3							
Same-sex play ^a	.06	-.09	-.01	.21**	.28***	-.04	.30*
R ² change	.01	.005	.001	.04**	.07***	.001	.06*
Step 4							
Sex × Same-Sex Play ^a	1.29****	-1.51****	-1.14****	-.74**	-1.01****	.05	-1.08***
R ² change	.11****	.16****	.09****	.04**	.07****	.001	.08***
R ² ^b	.67	.82	.68	.71	.71	.13	.57
Multiple R ^b	.82****	.86****	.82****	.84****	.85****	.36	.76****
Simple effects							
Same-sex play, boys ^b	-.41*	.53****	.32*	.45**	.51***		.30*
Same-sex play, girls ^b	.50*	-.46****	-.31*	.06	.40*		.09

^a Standardized beta coefficients from each step of the hierarchical regressions.

^b From the last step of the hierarchical regressions.

* $p < .05$. ** $p < .01$. *** $p < .005$. **** $p < .001$.

T1 same-sex play only for boys. Boys showed a positive relationship between playing with same-sex peers at T1 and engaging in rough-and-tumble play at T2, even after we controlled for initial (T1) levels of rough-and-tumble play.

For the prediction of activity level at T2, significant main effects for sex and T1 behavior were found. In addition, there was a significant interaction of sex and same-sex play at T1 (see Table 4). Simple effects analyses revealed dual polarization effects with significant but opposite patterns for boys and girls. A positive relationship was found for boys between playing with other boys at T1 and observed activity level at T2, above and beyond activity levels observed at T1. In contrast, girls showed a negative relationship between play with other girls at T1 and activity level at T2.

For gender-typed play, significant main effects for sex, T1 behavior, and same-sex play were found. In addition, the interaction of sex and same-sex play at T1 was significant. In this case, the simple effects analyses of the sex by same-sex play interaction revealed a positive relationship between playing with same-sex peers at T1 and observed gender-typed play at T2. This pattern was significant for both boys and girls, although it was stronger for boys than for girls (see Figure 2).

For negative emotionality at T2, the only significant predictor was negative emotionality at T1. Positive emotionality was predicted by sex, T1 positive emotionality, same-sex play at T1, and the interaction of sex and T1 same-sex play. Simple effects analyses revealed a single polarization effect in that there was a significant positive relation only for boys between playing with same-sex peers at T1 and expressing positive emotion at T2 (see Figure 2).⁴

Discussion

In this study, we addressed issues concerning the stability and consequences of sex segregation. The results showed that sex-segregated play was temporally stable, which has implications for understanding the origins and correlates of this type of play. The results also demonstrated the importance of peers as socializers of gendered behaviors by revealing both binary effects on group differences and social dosage effects on individual differences in outcomes.

The Stability and Strength of Sex-Segregated Play

The findings of the present study provide further evidence of the pervasiveness of sex segregation among children at play. On average, children spent much of their social interaction time with peers of the same sex (50%–60% of their peer interactions) and little with other-sex children (10%–15% of their peer interactions). Over 80% of the children showed clear same-sex play-partner preferences, and many boys and girls played almost exclusively with same-sex partners. This level of sex segregation was somewhat surprising given that teachers in these classrooms are encour-

⁴ We also ran these analyses using other- and mixed-sex play as predictors. For other-sex play, because of the relatively large inverse correlation with same-sex play ($r = -.59$), the pattern of findings was very similar (but reversed) to that for same-sex play. Mixed-sex play at T1 did not significantly predict the outcome measures at T2, nor did it interact with sex of child to predict T2 outcomes. The lack of findings for mixed-sex play is important because it suggests that it is not just peer interaction per se that predicts later outcomes but specific interactions with peers of one sex or another that account for the variance.

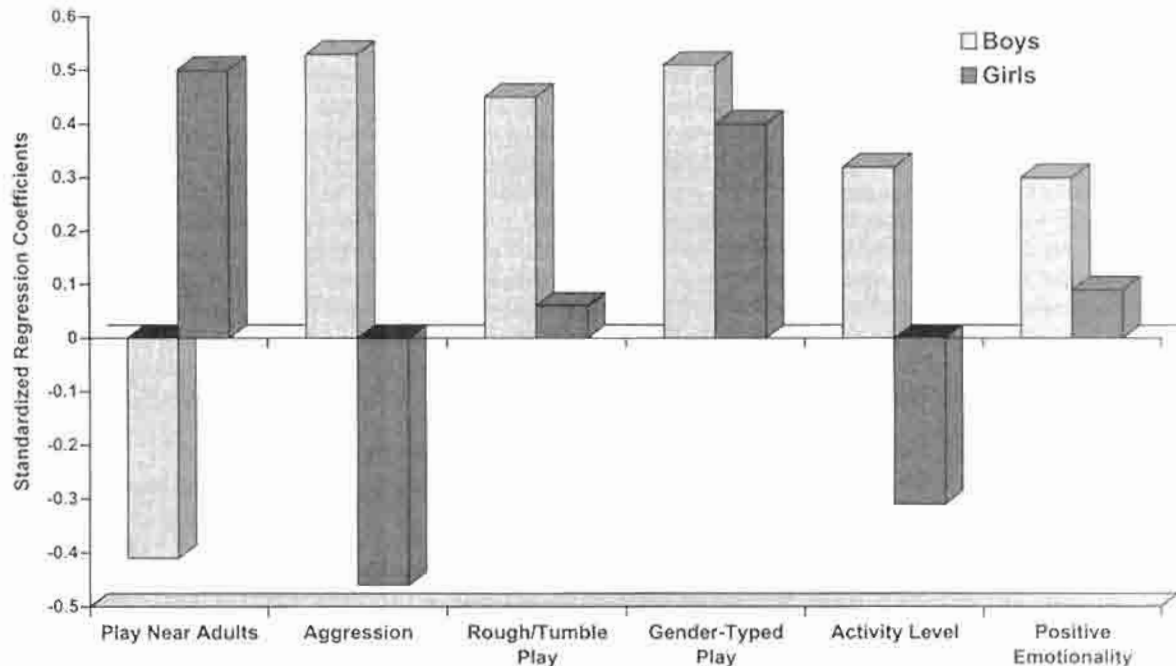


Figure 2. Standardized regression coefficients for simple effects analyses.

aged to promote gender equity. Thus, even when children find themselves in contexts where gender is de-emphasized, sex segregation remains quite strong.

That young children's peer preferences were highly sex differentiated is significant. Many sex differences—such as mathematical abilities—are considered to be small to moderate in magnitude (i.e., sex accounts for 2% to 5% of the variance in scores for females and males), and debate continues about the meaningfulness of these differences (Eagly, 1995; Hyde & Plant, 1995). In contrast to most sex differences, we found that approximately 70% to 80% of the variance in young children's choices of play partners was accounted for by sex. According to Cohen's (1977) guidelines for estimating magnitudes of group differences, the sex difference in playing with girls and playing with boys would be considered very large. In addition, when we consider the binomial effect size display (which can be used to illustrate the practical significance of a finding; see Rosenthal & Rubin, 1982), the display indicates that above-average amounts of playing with girls occur for about 96% of girls and only 6% of boys, whereas above-average amounts of playing with boys occur for about 93% of boys and only 4% of girls.

Play-partner preferences were found to be relatively stable over time, and as more data were aggregated, temporal stability increased. Interestingly, the way the data were grouped influenced stability estimates. When aggregated stability coefficients were calculated for playing with girls and playing with boys, they began high and ended very high—in the range of .90 and above. When calculated over same-sex and other-sex play partners, aggregated stability coefficients were lower. The difference in these two estimates was likely due to the narrower range of scores when the data were divided by same-sex and other-sex play partners. This is a methodological and statistical issue that researchers who are

interested in assessing the stability of children's play-partner preferences must take into account.

The pattern of increasing stability and decreasing variability as aggregation increased is similar to the results found for a variety of adult behaviors (e.g., Epstein, 1979, 1980) and in studies examining collective variables rather than individual-level variables (see Zajonc & Mullally, 1997). Increased stability with greater aggregation indicates the importance of obtaining multiple observations to adequately assess stable individual differences in children's play-partner choices. The decreased standard deviations for stability coefficients as numbers of aggregated observations increased suggests that the variance eliminated with aggregation methods was within-subject variance, which can be considered error variance in investigations of individual differences (Epstein, 1979).

The present findings differed from some of the earlier research on the stability of same-sex peer interactions. Methodological and age differences in the samples may explain some of the discrepancies. For example, age differences may partly account for our results differing from those found by Powlishta and colleagues (Powlishta et al., 1993). In the Powlishta et al. study, boys showed high levels of stability whereas girls did not, but the children were 2 1/2 to 3 years old, considerably younger than the preschoolers in the present study.

How play partners are coded during observations may influence the findings as well. For example, in the Powlishta et al. (1993) study, the number of same-sex play partners was determined by counting the number of same-sex children within a 5-ft (1.52 m) radius of the target child as well as those children with whom the target was interacting verbally or physically. In the present study, observers coded play partners only when there was evidence of direct verbal or physical interaction among peers. Because girls tend to play in smaller areas than boys, counting the number of

children surrounding girls may not be an accurate reflection of with whom they actually interact.

In the Lloyd and Duveen (1992) study of British preschoolers, observers used a "snapshot" coding of children's behavior in which they recorded several snapshots of what a child was doing and with whom over an undefined point in time. Although children showed some stability from one term to the next ($r = .40, p < .01$), the level of stability was not as high as that found in the present study when data were aggregated (especially when aggregated by sex), possibly because the number of observations was still much lower than in the present study. When the present results obtained with the lowest level of aggregation are compared with the British findings, the patterns are more similar, again suggesting that stability increases as the number of observations increases.

The present results also showed stronger temporal stability in playmate preferences than was found by Maccoby and Jacklin (1987). They found that the 1-week stability for the 12 preschool children for whom stability data were available failed to reach significance, although it was marginally positive ($r = .39$) and the correlation for older children was weaker ($r = .17$). The stability estimates in our study may have been higher because we had a larger sample size and a longer time frame for assessing stability. Like us, however, they found that preschool children's behavior and activity preferences were stable over time.

Differences in observational methods may also have led to divergent results. Specifically, in the Maccoby and Jacklin (1987) study, children were observed intensively over a single day and were observed again 1 week later. This method resulted in a large number of data points obtained in contiguous time intervals over only a few days. In the present study, several observations could be obtained on one child during a single day, but none of the observations would be contiguous in time. Moreover, observers in our study coded behavior over a longer period of time (over 6 months). Although the use of contiguous coding may increase the likelihood of finding stability, it would make stability less likely for children who vary somewhat in their choice of play partners but who play with their partners for long periods of time.

The finding that children maintained their relative levels of sex-segregated play over several months suggests that individual factors play a role in promoting children's tendencies to select same-sex play partners. Exactly which individual factors and characteristics are likely to influence children's play-partner choices remain unclear. Temperament may play a role. Children who are more active and more interested in rough-and-tumble play may be drawn into similar sorts of active play (Fabes, 1994). Moreover, children who are prone to disruptive behaviors may band together during play. Quieter and less disruptive children, often girls, may also form groups.

Cognitive factors may also be influential in sustaining sex segregation (Martin, 1991). Children's understanding of their own and others' sex may contribute to play patterns by setting up expectations about the likely characteristics of play they would encounter with a same-sex child and with an other-sex child (Martin, 1994). For instance, preschool children expect that same-sex peers will share their toy preferences but that other-sex peers will not, even with unfamiliar toys (Martin, Eisenbud, & Rose, 1995). The presumptions that children hold about shared interests for members of the same sex may guide their behavior, especially when peers are unfamiliar. Gender cognitions may act mainly as

influences on group differences (i.e., they promote the overall pattern of difference between girls and boys); however, variations in children's gender cognitions about others and their expectations about play with girls and with boys may also contribute to individual variation in same-sex preferences.

Although the present results concerning stability suggest that individual factors may be important in maintaining sex-segregated play, situational factors should not be overlooked. Clearly, children's play partners change depending on the situations in which children find themselves (Boyatzis, Mallis, & Leon, 1999). For instance, sex segregation occurs more often in situations where children have choices in playmates, such as in schools, and less often in other situations, such as in neighborhoods and in their own families. It is important to continue investigating the diversity in children's play-partner choices over time and in different situations (Thorne, 1993).

The assumption that variability in behavior indicates situational effects and the converse assumption, that situational factors necessarily produce behavioral instability, need to be challenged. Some situational factors are very consistent and contribute to stability in behavior. For instance, young children may receive consistently positive responses from peers for same-sex play and consistently negative responses for other-sex play (Fagot, 1977). As such, children could move from one play situation to another but find consistency in reactions from peers, thereby increasing the stability of children's own behavior.

Children's play-partner preferences are particularly intriguing because they illustrate characteristics of dynamic systems. The whole pattern may not be easily predictable from the individual patterns that contribute to it. Through the use of real-world cases and computer simulations of how racial, ethnic, or economic segregation occurs in neighborhoods, researchers have shown that the effects of individual actions on the system may be surprising (Hegselmann & Flache, 1998; Sakoda, 1971; Schelling, 1971). For example, we would expect that when individual group members are suspicious of one another, segregation levels tend to be high. However, even when relatively low levels of in-group preferences are shown by individual members, a high degree of segregation can be seen in group patterns. Thus, even relatively minor "pulls" toward same-sex peers—from either their gender-based cognitions or their activity preferences—can translate, at a group level, to highly sex-differentiated play patterns. From this research, two cautions about studying sex segregation become evident. The first is that researchers who study sex segregation should be careful not to infer the strength of individual motives from aggregate patterns (Schelling, 1971). Second, groups are influenced by both system-level and individual-level variables. For instance, groups have properties, such as hierarchical organization and cohesiveness, that go beyond individual-level peer experiences (Rubin, Bukowski, & Parker, 1998).

The Consequences of Same-Sex Play

Our results suggest that play in same-sex peer groups is related to young children's subsequent behaviors. Thus, it appears that children are socialized in predictable ways by same-sex peers and that the effects of peers are noticeable even within a fairly short period of time (from fall to spring).

Several aspects of girls' and boys' behavior were sex differentiated. The sex differences that were found were consistent with gender-stereotyped expectations for boys' and girls' behaviors (e.g., boys were more active than girls). Interestingly, most of these differences were found during the second term. Although boys and girls were not very different in most of these behaviors at the beginning of the school year, sex differences developed and/or increased over time. Some of these sex differences appear to be a function of peer experiences that amplify and extend initial sex differences (Maccoby & Jacklin, 1987).

The present findings also suggest that individual differences in exposure to same-sex peers contributed above and beyond the binary socialization experiences children had in same-sex groups. Children who spent more time with same-sex peers experienced more opportunities and/or stronger pressures to conform to gender-related behaviors than did children who spent less time with same-sex peers. The findings reflect social dosage effects and suggest that higher same-sex peer exposure results in more strongly sex-differentiated behavior after only a few months of exposure. Social dosage effects were evident even when we controlled for initial levels of the behavior. Thus, for both boys and girls, playing with same-sex peers contributed to tendencies to engage in gender-typed behaviors that went beyond initial individual tendencies to do so.

It is important to consider simultaneously the findings concerning group changes and individual differences. At a group level, none of the target behaviors showed the dual polarization pattern (i.e., both sexes moving in opposite directions over time). Instead, the singular polarization pattern (i.e., one sex staying the same and the other moving away over time) was found for the changes in activity level (boys only), play near adults (girls only), and gender-typed play (boys only). When mean changes were examined at a group level, changes appeared to be concentrated more often on one sex than on both sexes. Interestingly, however, the regression analyses suggested that a more complex pattern was occurring at the individual-difference level, one that typically involved both sexes. In the regression analyses, the dual polarization effect of same-sex exposure was the most common pattern found.

When we consider the regression findings in light of the mean changes in behaviors from fall to spring, it is apparent that same-sex exposure does not always translate into mean changes in sex differentiation. Overall, for 10 out of 12 of the behaviors, simple effects regression analyses were significant, with 6 (out of 6) being significant for boys and 4 (out of 6) for girls. Of these 10, 4 showed concomitant mean changes, suggesting that increased same-sex exposure exaggerated changes that occurred with less exposure, as might be hypothesized. For the remaining 6 behaviors, however, the lack of mean changes may signal several possibilities. For instance, offsetting patterns may occur in which high same-sex exposure results in changes in one direction and lower same-sex exposure results in changes in the other direction. Or, the exaggeration that is due to same-sex exposure may simply not be at a level sufficient to produce a significant mean change. Finally, the nonsignificant differences between means may be due to other factors, such as differences in initial levels of the index behaviors. Additional research is needed to examine in more depth the kinds of changes that occur with same-sex exposure at both a group level and an individual-differences level.

The same-sex exposure effects for boys suggest that time spent playing with other boys contributes to a forceful, active, and rough style of play (Maccoby & Jacklin, 1987). The more time boys spent playing with other boys in the fall, the greater the likelihood that they were observed to be rougher, more aggressive, and more active in their play the following spring. These play styles are consistent with the greater emphasis that boys place on competition as a basis for the formation of hierarchical peer group status (Fabes, Eisenberg, Smith, & Murphy, 1996) and with previous research on sex differences in activity level (Eaton & Enns, 1986). Through interactions with other boys, boys come to learn that rough and heavy-handed play styles may be necessary to have an influence on their play partners. Serbin, Sprafkin, Elman, and Doyle (1982) found that young boys' influence attempts more often took the form of direct and power-assertive demands and that over time boys became less responsive to indirect and more polite styles of influence (see also Miller, Danaher, & Forbes, 1986). Moreover, boys have been found to modify their behavior in response to other boys' influence attempts but not in response to those of girls (Fagot, 1985). Thus, it appears to take considerable force and action to influence other boys and to get them to respond (Fabes, 1994; Maltz & Borker, 1982), and play in boys' groups may provide boys with opportunities to learn what they need to do to influence their same-sex playmates.

Boys who spent more time with other boys in the fall showed increased levels of gender-typed play in the spring. Exposure to same-sex peers likely provides more opportunities for playing in gender-typed activities.

Our findings showed that the more boys played with other boys, the more positive emotions they were observed to express over time. Thus, although play among boys is rough and dominance oriented, boys appear to find this active type of play increasingly interesting and compelling. Boys who do not find this kind of play interesting may withdraw from play with boys or may be rejected by other boys, which would decrease their expressions of positive emotions. That many boys find this type of interaction pleasing and exciting is consistent with other research suggesting that boys respond with aroused interest and a matching response when another boy makes a bid to initiate rough play, whereas girls do not (Jacklin & Maccoby, 1978). Over time, experience in boys' groups enhances the likelihood that boys will respond positively to the type of play that occurs within their same-sex playgroups.

Typically, boys' play is less adult structured, which may be due in part to the fact that boys tend to play further away from adult supervision (Maccoby, 1990). The present findings suggest that as boys spend more time playing with other boys, the less time they spend playing near adults. The reason for this relation remains unclear. Boys may pull away from adult supervision to avoid having their play structured by adults, or adults may be less able to supervise boys as their play becomes increasingly active and spread over a larger space. Regardless, the relatively less supervised nature of boys' play may contribute to the increased forceful and active nature of boys' interactions.

The same-sex exposure effects for girls were also evident in a variety of ways. Although girls showed an increased tendency to play near adults over time, higher levels of same-sex exposure magnified this tendency. Over time, girls may realize that access to resources is more equitable when adults are nearby, and therefore

they may increasingly spend time playing near adults (see Powlisha & Maccoby, 1990).

For girls, exposure to same-sex peers appears to contribute to a relatively calmer style of interaction. Girls with increased exposure to other girls during the fall showed lower activity levels and aggression in the spring. This calmer and less physical style of interaction may be effective in attracting and influencing other girls (and adults, but not boys). Moreover, these effects persisted even when we controlled for initial individual differences in these tendencies. Such findings are consistent with other data that suggest that girls' influence attempts are increasingly likely to take the form of polite suggestions as girls get older (Serbin et al., 1982) and that girls' interactions increasingly involve positive reciprocity and collaboration (Leaper, 1991). Same-sex exposure also influenced gender-typed play: Girls who had more same-sex exposure during the fall showed increased gender-typed play during the spring. Girls with more same-sex exposure likely have more opportunities to engage in gender-typed play activities because of their playmates' interest in these activities.

Not only do boys' and girls' experiences in their sex-segregated peer groups contribute to subsequent gender-typed interactions and play styles, but they also contribute to the phenomenon of sex segregation itself. A reciprocal pattern is initiated in which play with same-sex peers promotes interactional patterns and play styles that become increasingly consistent with the styles necessary to interact with and successfully influence same-sex peers (see Leaper, 1994; Maccoby, 1998). These styles socialize boys and girls to develop patterns of behavior that the other sex likely finds increasingly unattractive and uninteresting. For example, the influence styles that develop within same-sex peer groups may be relatively ineffective in influencing other-sex peers, and this ineffectiveness may lead to decreased motivation and appeal in playing with other-sex peers. As a result, girls and boys become less likely to interact with one another.

In particular, the highly active, heavy-handed, dominance-oriented style of boys may be compelling for other boys but may be aversive to most girls (Maccoby & Jacklin, 1987; for a review of similar sex differences in apes and monkeys, see Meaney, Stewart, & Beatty, 1985). These aspects of boys' interactions involve a great deal of physicality, which many girls find unappealing. As boys' physicality increases over time, girls' interest in playing with boys may decrease. In turn, boys may become increasingly compelled to play with other boys while they also begin to find playing with girls less compelling because girls do not respond positively to their physical styles of play. As children grow older, these patterns of behavior become more ingrained, and it is likely that these patterns contribute to the increases in sex segregation that are seen later in childhood (Fabes, 1994; Maccoby, 1994). Over time, it may be increasingly difficult for children to interact compatibly with other-sex children who have developed a different set of social skills, styles, expectations, and preferences. Thus, we would expect children to increasingly seek out same-sex peers as play partners over time, and the present data confirm that even over the relatively short period of time covered in this study, the proportion of same-sex play increased (see Table 1).

Because of the correlational nature of the research, we acknowledge that we cannot demonstrate a causal role for same-sex peer exposure. There may be a third factor accounting for the findings. For instance, it could be argued that any type of peer interaction

may facilitate changes in children's behavior over time. To examine this possibility, we analyzed the data using proportion of time spent in mixed-sex play as a predictor and did not find variations in mixed-sex play to be related to later behaviors (see Footnote 4). This finding suggests that it is not simply play with peers that contributes to changes in children's behavior. Taken together, the patterns suggest that same-sex peers may be contributing to changes from one term to the next that are above and beyond the tendency that is already apparent in children's behavior.

The many modes of influence involved in peer socialization need to be investigated. In addition to providing practice in certain behaviors and in interaction skills (e.g., Harris, 1995; Maccoby, 1998), peers are actively involved in encouraging gender-typed play (e.g., Fagot, 1977; Fagot & Patterson, 1969). Other avenues of peer influence have not been explored in depth. For example, peers may play the role of gender "enforcers," who monitor and maintain gender boundaries by conveying information about the correct behavior for girls and boys and about the consequences likely to occur if gender boundaries are violated (Sroufe et al., 1993). Little is known about this type of influence, although Fagot and Leinbach (1983) discussed the fact that children give messages about with whom and with what to play. In our study, observers reported that some children were very actively involved in providing messages about gender-appropriate behavior and boundaries.

The present findings suggest that about equal proportions of both boys' and girls' same-sex peer interactions are with one other child and with groups of children. In contrast, other-sex interactions tend to be dyadic. The finding that peer group size varied by sex of playmate may help to resolve the issue about whether girls prefer dyadic interactions more than boys do. For instance, although older children show sex differences in the size of peer groups, with girls preferring dyadic play (Thorne, 1986), the results of research with younger children have been mixed (Benenson, 1993; Pitcher & Schultz, 1983; Strayer, 1980). The discrepancies in these studies may be due to the makeup of the peer group. That is, to the extent that children play only with same-sex peers, no sex differences would be expected in peer group size. Given that children are increasingly likely to play in same-sex groups as they get older and that this tendency is especially true for boys, sex differences in group size (larger for boys) would be expected to increase with age because of enhanced tendencies to play in same-sex peer groups. Longitudinal data covering several years are necessary to examine this possibility.⁵

Limitations and Conclusions

The topic of sex segregation is ideal for investigating the complex interplay of individual-level and group-level factors. For

⁵ We appreciate the input of the reviewer who suggested that these findings may be a statistical phenomenon. Given that children show preferences for same-sex playmates, the probability of playing with any same-sex playmate is greater than that of playing with other-sex playmates. Thus, when children are in a same-sex dyad, it is more likely that a child who joins the group will be of the same sex. The same-sex dyad then becomes a same-sex group. In contrast, when children are playing with an other-sex peer, there is not the same high probability of having a same-sex peer join them. If a same-sex child joins, the group becomes a mixed-sex group. Thus, the baseline probability of having a group of playmates all of the other sex becomes very low.

example, children who have well-developed gender stereotypes and who are motivated to be like others of their own group may be particularly likely to be influenced by same-sex peers. These children may learn quickly from exposure to same-sex peers, and they may be particularly attuned to peer messages about appropriate behavior. In addition, children's stereotypes may become increasingly salient and may be primed simply by the presence of peers (see Serbin, Connor, Burchardt, & Citron, 1979). If a class contains several children who frequently issue admonitions about sex-appropriate play, an entire class of children may develop stereotypes and come to rely on these stereotypes during school. Peers can do more than be models and providers of rewards—they also may provide reminders and motivations about the importance of adhering to gender stereotypes.

As with any piece of research, there are important limitations of the current study to consider. First, the fact that these data were collected from primarily Caucasian, middle- to upper-middle-class children enrolled in a university day-care facility limits the generalizability of the findings. Different patterns may be found with children from different ethnic groups or in other settings. For example, in the university facility, the teachers reported trying to minimize gender-stereotypic play and interactions, and the ratio of adults to children was relatively high, thereby minimizing children's opportunities to get very far away from adult supervision. We might expect the influence of sex-segregated play to be even more robust for children in commercial preschool settings.

In addition, our observational procedures focused only on unstructured play and were not very sensitive to low-frequency behaviors (such as aggression or the expression of negative emotion). Moreover, these procedures did not allow us to examine how the specific characteristics of the peer group contributed to the differences that were found. Although the findings suggest that same-sex play influenced subsequent behavior patterns, we do not know precisely what it was about children's playmates or their interactions with them that contributed to these behaviors. By noting the characteristics of the children that a child plays with and observing how the children interact, we may be better able to elucidate the processes through which peers socialize each other (Fabes et al., 1997).

Despite the limitations of the present study, the findings suggest that play with same-sex peers is a salient and pervasive feature of preschoolers' interactions at school. Although children's play-partner choices vary depending on the situation, stable individual differences are evident in children's play. The present study is the first that we know of designed specifically to examine the cumulative influence of sex-segregated play among young children and the possibility of "dosage-related" influence of same-sex play on behavior. The findings support the conclusion that the experiences children have with same-sex peers have later consequences for how they behave and interact. Time spent with same-sex peers sets powerful forces in motion that affect children's subsequent development.

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