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Exposure to Externalizing Peers in Early Childhood: Homophily and Peer Contagion Processes

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Abstract

Guided by a transactional model, we examined the predictors and effects of exposure to externalizing peers in a low-risk sample of preschoolers and kindergarteners. On the basis of daily observations of peer interactions, we calculated measures of total exposure to externalizing peers and measures of exposure to same- and other-sex externalizing peers. Analyses of predictors of externalizing peer exposure supported a homophily hypothesis for girls. Tests of peer contagion effects varied by sex, and exposure to externalizing peers predicted multiple problem behaviors for girls but not for boys. Sex differences were a function of children's own sex, but not of peers' sex. The study provides evidence of externalizing peer exposure effects in a low-risk sample of young children, notably for girls.

Keywords

peer exposure; externalizing behavior; sex differences; early childhood

The title of our paper reflects the possibility that exposure to peers can affect who we are and what we become. Support for this idea has been generated by studies showing that peers have the potential to be powerful influences on the development of problem behaviors. For example, as aggressive adolescents interact with their peers, they reinforce deviant communication and interaction patterns, thereby encouraging each other to engage in more antisocial and delinquent behaviors (Dishion, Spracklen, Andrews, & Patterson, 1996). That this effect can be seen in naturally occurring peer groups (e.g., mutual friendships), as well as contrived ones (e.g., intervention groups), suggests that this is not simply a function of selection bias. Instead, this appears to be due to a more fundamental peer process in which exposure to aggressive peers socializes negative behaviors.

In this study, we extended this line of research in several ways. The primary aim was to consider peer exposure processes in early childhood, focusing on the mechanisms that bring some young children into greater contact with relatively more externalizing peers and the consequences of such peer exposure for young children. To address these issues, we drew on a transactional model, and we considered the roles of children's own and peers' gender. Our secondary aims were methodological. We examined externalizing peer exposure processes in a sample of young children who were at low risk for the development of antisocial behavior. Doing so allowed us to consider the universality of peer exposure processes (Luthar & Becker, 2002; Sroufe, 1990). Additionally, we introduced a new strategy for studying peer exposure effects.

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A Transactional Model of Externalizing Peer Exposure in Early Childhood

A central question in this work is a developmental one; that is, can peer exposure effects for externalizing behavior be identified in early childhood? Certainly, peers are important members of young children's lives (Harris, 1995). Preschoolers and kindergarteners engage in social play and are selective in their peer affiliations, forming reciprocal friendships and establishing social networks with particular peers (Snyder, West, Stockemer, Gibbons, & Almquist-Parks, 1996; Strayer & Santos, 1996). Some research also suggests that young aggressive children, like older aggressive children, may congregate together (Estell, Cairns, Farmer, & Cairns, 2002; Farver, 1996). Moreover, children who are high in prosocial behavior also congregate together and rarely interact with those who are low in prosocial behavior and high in aggression (Fabes, Martin, & Hanish, 2002). Thus, young children who are aggressive are exposed to relatively more aggressive peers and relatively fewer peers who act in more socially acceptable ways. What is less clear, however, is what aspects of children's behavior bring them into contact with their more externalizing peers and what the effects of externalizing peer exposure are on children's own functioning. We found only one published study that has considered exposure processes in early childhood (Snyder, Horsch, & Childs, 1997), and significant questions remain regarding the processes involved in such exposure. Thus, the present research is designed to take the next step in delineating the processes that underlie externalizing peer exposure in early childhood.

A reasonable assumption is that children shape one another in a transactional way, such that children's predisposing characteristics influence the kinds of social behaviors they exhibit and the types of social interactions they seek out (e.g., niche picking), as well as the nature and quality of peers' responses. In turn, peers' behaviors influence children's own behavior, which then affects subsequent peer interactions (Martin & Fabes, 2001; Parker, Rubin, Price, & DeRosier, 1995). Together these mutual cycles of influence lead children toward particular social and behavioral interaction styles and away from others, making a transactional model a useful heuristic framework for understanding how children come to interact with externalizing peers and how externalizing peers mold children's subsequent developmental trajectories. On the basis of such a conceptualization, we tested two hypotheses about externalizing peer exposure: the homophily hypothesis and the peer contagion hypothesis.

Homophily

Interactions with externalizing peers are not equally distributed among all children; rather, some children—namely those who are themselves aggressive—are more likely than others to interact with externalizing peers. This process of selective affiliation, known as homophily, likely happens via multiple mechanisms (Cairns, Cairns, Neckerman, Gest, & Garipey, 1988; Espelage, Holt, & Henkel, 2003). On the one hand, because children generally prefer to play with peers who are similar to them, aggressive youngsters may actively seek out and form relationships with aggressive peers. Thus, aggressive children may have greater contact with externalizing peers because of behavioral similarities. On the other hand, however, aggressive children are sometimes isolated from the mainstream peer group. In the extreme, mainstream peers may respond to aggressive children with disapproval in the form of victimization or exclusion (Hanish et al., 2004), leaving few options for interaction partners other than aggressive peers.

Although homophily is a well-established phenomenon, it is not clear what specific behavioral factors predict externalizing homophily among young children, though the presence of externalizing behaviors and the absence of socially competent behaviors are likely candidates. We investigated several externalizing and socially competent predictors of homophily, considering the relative importance of each in determining exposure to externalizing peers. We expected that children who were predisposed (whether because of temperamental

characteristics or early developmental experiences) to exhibit relatively high levels of externalizing characteristics (i.e., aggression, high activity levels, and negative emotions) would spend more time with externalizing peers. Similarly, we anticipated that the children who exhibited relatively high levels of socially competent behaviors and positive emotions would spend less time with externalizing peers (Fabes et al., 2002).

Peer Contagion

By modeling or directly teaching new behaviors, by reinforcing or punishing existing ones, and by creating a peer culture that supports particular interaction styles, children are powerful influences on one another. This can be seen in the findings of recent studies of school-age youth that have demonstrated dyadic- and group-level influences on the emergence and maintenance of aggression in play groups, such that aggression is more common in peer groups that are characterized by high levels of negative affect, conflict, dislike, activity level, and competition (DeRosier, Cillessen, Coie, & Dodge, 1994; Dodge, Price, Coie, & Christopoulos, 1990). Moreover, as youngsters spend time with relatively externalizing peers, they come to adopt similar attitudes and behavioral styles on numerous dimensions. For instance, studies have shown that adolescents who affiliate with deviant peers are at risk for increases in multiple indicators of dysfunction, including substance use, risky sexual behavior, arrest rates, and violence (Dishion, Eddy, Haas, Li, & Spracklen, 1997; Fergusson, Swain-Campbell, & Horwood, 2002; Patterson, Dishion, & Yoerger, 2000).

Thus, in testing the peer contagion hypothesis, it may be useful to consider how the principle of multifinality (i.e., any risk factor may result in multiple outcomes; Cicchetti & Rogosch, 1996) might apply. In this study, we examined the extent to which exposure to externalizing peers predicted several developmentally relevant indices of young children's externalizing behaviors, including aggressive behavior, negative affect, and hyperactivity, as well as internalizing behaviors (i.e., anxiety). Studies indicating that the presence of both externalizing and internalizing behaviors is associated with more problematic functioning highlight the importance of considering both types of outcomes when examining the effects of exposure to externalizing peers (Capaldi & Stoolmiller, 1999).

Sex Differences

Many studies indicate that boys are more likely than girls to exhibit externalizing behaviors, although sex differences in externalizing behavior may be less pronounced in early childhood than at older ages (Keenan & Shaw, 1997). Furthermore, there are significant differences in boys' and girls' social experiences that appear during early childhood. Sex segregation is a common phenomenon in young children's play, and play with same-sex peers is more common than play with other-sex peers (Leaper, 1994; Maccoby & Jacklin, 1987; Martin & Fabes, 2001). Moreover, boys' play tends to be qualitatively different from girls' play during early childhood. Boys tend to interact in more active, impulsive, rough, competitive, and forceful ways than do girls, whose interactions tend to be more cooperative, quiet, and regulated (DiPietro, 1981; Fabes, 1994; Maccoby, 1998). Boys also are more likely than girls to be concerned with dominance hierarchies and to use more heavy-handed, physical strategies to influence others and resolve conflict (Miller, Danaher, & Forbes, 1986).

Thus, understanding the role that sex plays in determining affiliation with externalizing peers and peer exposure effects is crucial. To test for sex differences, we considered children's own sex as well as the sex of peer interaction partners, allowing for the possibility that sex effects can occur via one or both of these mechanisms. Because boys are more likely to be involved in active, agonistic, interactions that frequently reflect externalizing behavior, we expected exposure to externalizing peers to be a more normative occurrence for boys than for girls. Consequently, we expected one of two alternative patterns with regard to sex differences. The

first is an “accumulation” pattern: that is, boys may evidence greater aggression and externalizing behavior problems because they are, stereotypically, exposed to this type of behavior on a more regular basis than are girls. The second is a “normative experience” pattern in which exposure to externalizing peers may have less negative effects on boys’ functioning than it does on girls’ functioning given that it is a regular and expected part of boys’ social interactions and daily lives. In contrast, for girls, exposure to externalizing peers is a non-normative event, making it more salient and, as a result, potentially more influential. In our research, we examined which of these patterns was more likely the case.

Sample Considerations

One feature of this study is the use of a nonclinical sample drawn from a low-risk background. Children in this sample came primarily from two-parent, highly educated, middle-income families. The use of such a sample affords opportunities that are not available in studies with clinical samples or samples drawn from high-risk environments. Every child in a given classroom was included in the study, providing the opportunity to fully map young children’s naturally occurring peer affiliations at school. Additionally, examining peer exposure processes in young children who were not necessarily at risk for externalizing behavior allowed us to consider issues related to the generalizability of peer exposure across populations (Sroufe, 1990). The importance of translating risk research from high- to low-risk populations has recently been demonstrated by Luthar and Becker (2002) and determining whether developmental risk processes are universal or population-specific is critical to understanding how problem behavior occurs.

Methodological Considerations

Peer relationships in early childhood are structured differently than they are for older children. Specifically, older children and adolescents have considerably more autonomy in selecting particular peers into their social networks and excluding others than do young children. Because older youth typically attend larger classes in larger schools, and because they typically have greater access to neighborhood peers, they tend to have many more peers available from which to select. Thus, their social networks may be quite broad, and social interactions are more likely to occur out of the purview of adults. In contrast, young children typically select their playmates from a smaller set of peers. This is particularly true for young children, like those in our sample, who attend full-day, 5-day-a-week preschool or kindergarten classes. Moreover, adults are more often aware of the social interactions in which young children engage. As a result, young children’s peer affiliations can be observed more readily than can older children’s peer affiliations, making it easier to capture the full range of peer exposure. Thus, whereas most measures of externalizing peer affiliation among adolescents rely upon self- or other-reports of the adolescent’s closest friends, in early childhood, we have a unique opportunity to create new strategies that can be used to assess the impact of interactions with associates and acquaintances, as well as close friends. We did this by observing children’s social interactions at school and recording the number of times each child interacted with a particular peer. These data were then combined with indices of externalizing behaviors to provide relatively precise estimates of children’s exposure to relatively high externalizing peers at school.

Summary of the Present Study

In this study, we investigated peer exposure processes in young children, testing two hypotheses based on a transactional model: the homophily and the peer contagion hypotheses. In doing so, we considered whether children’s own or peers’ sex influenced the relations between externalizing and socially competent behaviors and exposure to externalizing peers or between exposure to externalizing peers and externalizing and internalizing outcomes. To

address these issues, we drew on a sample of preschoolers and kindergarteners who were at low risk for the development of antisocial behavior, and we used a new method for calculating peer exposure to test our hypotheses.

METHODS

Participants

Participants were enrolled in full-day, 5-day-a-week preschool or kindergarten classes in a university-sponsored child-care facility located in a Southwestern metropolitan city (each class generally had equal numbers of boys and girls). The school served children (primarily from middle-income families) from the university and surrounding community, and the teacher–child ratio was high (one teacher for every three to five children). The permission rate was 99%.

A total of 137 children (71 boys, 66 girls) participated in this study. At the beginning of data collection, boys' and girls' mean ages were 50.75 months ($SD = 11.79$) and 51.18 months ($SD = 10.29$), respectively (age range for all children = 33–84 months). Participants were predominately non-Hispanic White (64%); additionally, 10% were Asian American, 8% were Hispanic, 5% were African American, 2% were Native American, and the remaining 10% were of mixed ethnicity. The majority of the children came from highly educated families; a total of 75 and 81% of mothers and fathers had completed college, respectively. Additionally, most children came from two-parent families (68%); the remaining families were divorced (13%) and never-married (19%).

Procedures

Data were collected in three waves over 3 years.⁴ For those children who attended the school for more than one year ($n = 30$), we used only their first year of data (to prevent dependencies). Data were collected at three times throughout the fall of each year, although there was some overlap between Time 1 (T1; first month of the fall semester; i.e., September) and Time 2 (T2; entire fall semester; i.e., September through December), and between Time 2 and Time 3 (T3; last month of the fall semester; i.e., December). T1 data were used as predictors of exposure to externalizing peers in analyses testing the homophily hypothesis and as control variables in analyses testing the peer contagion hypothesis. Data collected at T2 were used as the basis for calculating the index of exposure to externalizing peers. T3 data were used as outcomes in testing the peer contagion hypothesis. Data were obtained using multiple methods, including ratings made by primary and secondary teachers, and behavioral observations and observers' ratings made by independent observers.

Scan Observational Procedures—Daily observations of young children's naturally occurring behaviors were obtained during the fall semester. Observations were conducted during morning and afternoon times whenever children were engaged in free-play activities (all times except teacher-led activities, lunch, and naptime). Observations took place on the playground and in the classroom. Approximately 10 undergraduate observers per semester rotated through a randomly ordered list of children and observed each child for 10 s. The observer then recorded the behavior the child was engaged in—behavioral coding categories included social play, parallel play, solitary play, unoccupied behavior, and teacher-oriented interactions. These coding categories were mutually exclusive, with the coding category determined by the child's predominant activity during the 10-s observation. For every observation that was social in nature, the identity code of the target child's play partners was

⁴An additional wave of data was not included in this study due to missing data on relevant variables.

recorded. In addition, the observer coded the intensity of positive and negative emotions displayed by the child and the child's activity level.

On average, 19,832 observations were obtained each semester. The total number of observations per child ranged from 22 to 430, with an average of 245 observations per child. Four children, each with fewer than 100 observations were dropped from the analyses due to an insufficient sample of behavior. To obtain interrater reliability estimates, two observers simultaneously coded approximately 10% of the observations. These procedures have demonstrated reliability and validity in previous studies and they were found to be reliable in this study (see below; Fabes, Shepard, Guthrie, & Martin, 1997; Martin & Fabes, 2001).

Observer Global Rating Procedures—After observing children over the first month of the school year, observers provided ratings of their impressions of each child on the basis of their knowledge of each child. For the present purposes, ratings of social competence, aggression, and anxiety/sadness were used. Scores for each child were averaged across observers, and all observers (approximately 10 per semester) rated each child.

Teacher Rating Procedures—At the end of the fall semester, primary and secondary teachers completed a packet of questionnaires for each child in their classroom. Included in the packet were measures of aggressive behavior, hyperactivity, anxiety, and prosocial behavior. Primary and secondary teachers completed the questionnaires independently. Primary and secondary teachers' ratings were highly correlated (r s ranged from .63 to .78, p s < .001) and were averaged together.

Measures

T1 Measures—The following measures were used as predictors of externalizing exposure in analyses testing the homophily hypothesis: activity level, negative emotion, positive emotion, aggression, and social competence. Measures of activity level, negative emotion, and positive emotion were obtained from scan observations collected over the first month (i.e., September) of the school year. Activity level ratings were obtained using a 4-point scale, ranging from no activity to high activity (e.g., exaggerated and hyperactive motor activity). Ratings were based on the duration and intensity of activity. Negative emotion and positive emotion ratings were also obtained using 4-point scales. Negative and positive emotions were rated separately, and scale descriptors ranged from no evidence of emotion to strong evidence of emotion. Facial expressions, the quality and tone of vocalizations (e.g., crying, laughing, saying "I'm mad"), and body language were used to make assessments of emotional intensity. T1 data were averaged together to create activity level ($\alpha = .73$), negative emotion ($\alpha = .78$), and positive emotion ($\alpha = .74$) scores for each child.

Observers completed global ratings of children's aggressive behavior and social competence during the first month of the school year (i.e., September) using single-item measures of each construct. A 7-point Likert-type scale, ranging from *very low frequency* to *very high frequency* was used to rate the extent to which each child exhibited aggressive (e.g., physically and verbally aggressive behaviors) and socially competent (e.g., skilled, capable, and effective social interactions) behaviors. Alpha reliability estimates, calculated by estimating the correspondence among raters were, .80 and .83 for aggression and social competence, respectively.

The T1 activity level, aggression, and negative emotion measures were also used as covariates in analyses of the peer contagion hypothesis. Additionally, observers rated children's anxiety/sadness at T1 using a 7-point Likert-type scale ($\alpha = .77$). This variable was also used as a covariate in tests of the peer contagion hypothesis.

T2 Measures—Our measure of exposure to externalizing peers at T2 was based on observed counts (over the course of the entire fall semester; i.e., September through December) of the number of times that each child was observed in a social interaction (including parallel play as well as direct interaction) with an externalizing peer (interrater agreement for peer identity was 88.5%) weighted by primary and secondary teachers' ratings of that peers' externalizing behavior. Externalizing peers were identified as those children whose score on a measure of externalizing behavior was >1 *SD* above the mean. Externalizing behavior was rated using Lochman et al. (1995) measure of externalizing behavior (sample items were "Defiant toward adults," "Starts fights with other children," and "Breaks things on purpose"; $\alpha = .97$). Ratings were made using a 4-point Likert-type scale, ranging from *never* to *often*.

Exposure to externalizing peers was calculated by first multiplying the number of times that each child interacted with a particular externalizing peer by that peer's externalizing score. For example, if Johnny played with Bobby (an externalizing peer) 24 times throughout the semester, we multiplied 24 by Bobby's externalizing score; this product score was calculated for every possible externalizing peer dyad per child. Next, each child's product scores were averaged across play partners to yield a mean externalizing exposure score. To control for individual differences in the number of times each child was observed, we created standardized scores using a scale of 100 observations, such that the total number of observations for each child was divided into 100. This number was then multiplied by the mean externalizing exposure score for each child, resulting in a measure of the density of exposure to externalizing peers. Following these procedures, three exposure scores were calculated for each child: total externalizing exposure, same-sex externalizing exposure, and other-sex externalizing exposure.

Also at T2, we computed the proportion of time spent in social play by dividing the number of times a child was observed to engage in a social interaction with a peer (e.g., social conversation, cooperative play) by the number of times he/she was observed ($\kappa = .89$).

T3 Measures—The following measures were used as outcomes of externalizing peer exposure in analyses testing the peer contagion hypothesis: negative emotion, aggression, hyperactivity, and anxiety. These were obtained at the end of the fall semester (i.e., December). The measure of negative emotion was obtained from scan observations collected over the last month of the fall semester. As described previously, observers rated the intensity of negative emotions using a 4-point scale, and ratings for the last month of the term were averaged together ($\alpha = .76$).

The measures of aggressive behavior, hyperactivity, and anxiety were obtained from primary and secondary teachers' ratings that were obtained at the end of the fall semester (December). Aggression was rated using the proactive and reactive subscales of Dodge and Coie's (1987) measure of aggression. The 5-item proactive aggression subscale assesses unsolicited aggressive acts (e.g., "This child uses physical force or threatens to use force in order to intimidate other children"; $\alpha = .93$). The 3-item reactive aggression subscale includes items such as "When this child has been teased or threatened, he/she gets angry easily and strikes back" ($\alpha = .88$). Items were rated using a 5-point Likert-type scale; with response options ranging *never true* to *always true*. The proactive and reactive subscales were highly correlated ($r = .74, p < .001$) and were averaged together.

Hyperactivity was assessed using the 4-item Hyperactivity subscale of the Children's Behavior Scale (Ladd & Profilet, 1996) using a 3-point Likert-type scale, with response options ranging from *doesn't apply* to *certainly applies*. Sample items include 'restless, runs about or jumps up and down' and 'squirmy, fidgety child' ($\alpha = .91$).

Anxiety was measured using Kendall et al.'s (Kendall, Henin, MacDonald, & Treadwell, 1998) 15-item scale. Items reflecting fear, anxiety, and psychosomatic complaints were rated on a 3-point Likert-type scale ($\alpha = .88$). Response options ranged from *not true* to *very true* or *often true*.

RESULTS

The primary purpose of our analytical strategy was to examine young boys' and girls' exposure to externalizing peers. After conducting descriptive analyses, we tested two hypotheses regarding exposure to externalizing peers: the homophily hypothesis and the peer contagion hypothesis. We followed the central tests of these hypotheses with analyses that allowed us to probe for different patterns of effects for exposure to same-sex and other-sex externalizing peers.

Descriptives

The distributions of T1 observer-rated aggression, T1 observed negative emotion, T3 observed negative emotion, and T3 anxiety were positively skewed, with most scores on these variables falling at the low end of the scale (see Table I). Additionally, univariate outliers were found for each of these variables. Thus, these variables were log transformed, and transformed variables were used in subsequent analyses.⁵ In comparison, T1 observer-rated social competence, T1 positive emotion, T1 observer-rated sad/anxious, T3 teacher-rated aggression, and T3 teacher-rated hyperactivity exhibited more normal distributions, and no outliers were found for these measures. Analyses indicated that boys were rated by observers as more aggressive than girls at Time 1 ($M_s = .30$ and $.24$, $SD_s = .17$ and $.14$, respectively, $t(134) = 2.30$, $p < .05$) and rated by teachers as more hyperactive than girls at Time 3 ($M_s = .176$ and 1.45 , $SD_s = .56$ and $.52$, respectively, $t(135) = 3.34$, $p < .001$). No other sex differences were obtained.

Descriptives for the teacher-rated externalizing measure that was used to calculate exposure are also presented in Table I. Scores on this measure ranged from 1.00 to 3.90 (on a scale ranging from 1 to 4). No univariate outliers were found for this variable, and the distribution approximated a normal distribution. There were no mean level sex differences ($M_s = 2.06$ and 1.86 , $SD_s = .76$ and $.76$, for boys and girls respectively, $t(135) = 1.49$, ns). To identify externalizing children for the exposure analyses, we identified the children whose scores on externalizing were greater than 1 SD above the mean ($n = 27$). The average externalizing score for this subset of the sample was 3.22 (range = 2.79–3.90). Boys and girls were equally likely to be identified as high externalizing (15 boys; 12 girls), $\chi^2(1) = 0.66$, ns . Externalizing children were rated by teachers as more hyperactive and more aggressive than their nonexternalizing peers, $t_s(135) = -7.19$ and -10.67 , $p_s < .001$. They were also rated by observers as more aggressive, $t(134) = -4.16$, $p < .001$. Additionally, high externalizing children were observed to display less positive emotion and more negative emotion, $t_s(131) = 2.19$ and -3.89 , $p_s < .05$ and $.001$ (see Table II). Only these children were included as peers in the calculation of each child's exposure index.

Children's scores on the exposure index ranged from 0 to 18.32. The mean score was 3.70, suggesting that most children had relatively low levels of externalizing peer exposure and relatively few children had higher scores reflective of frequent involvement with more externalizing peers. In fact, fewer than 25% of the children had scores above 5.0, and approximately 10% of the children had scores above 10.0. Thus, the externalizing exposure measure was positively skewed, and 12 univariate outliers were found. This measure was log

⁵T1 observed activity level was negatively skewed. This variable was reflected and log transformed in preliminary analyses. However, because analyses using the transformed version of T1 observed activity level produced similar findings, analyses with the untransformed variable are reported for ease of interpretation.

transformed, and the transformed measure was used in subsequent analyses. Similarly, the same-sex and other-sex externalizing exposure measures were positively skewed for both boys and girls. These measures were also log transformed. Boys ($M = .53$, $SD = .37$) and girls ($M = .49$, $SD = .39$) were equally likely to be exposed to externalizing peers using the total exposure measure, $t(135) = .72$, *ns*. Moreover, there were no sex differences in exposure to same-sex externalizing peers ($M_s = .50$ and $.58$, $SD_s = .45$ and $.43$, respectively), $t(135) = -1.03$, *ns*. However, boys were more likely than girls to be exposed to other-sex externalizing peers ($M_s = .50$ and $.34$, $SD_s = .34$ and $.35$, respectively), $t(135) = 2.63$, $p < .01$.

Table III shows the correlations among variables. Variables were generally related as would be expected, with externalizing variables related to one another, internalizing variables related to one another, and social competence variables related to one another.

Exposure to Externalizing Peers

A preliminary question of interest was whether exposure to externalizing peers was simply a function of sociability, such that children who spent proportionately more time in social play would have the greatest exposure to externalizing peers. To test this, we examined the relation between proportion of observed social play and high externalizing exposure. There was a weak, but significant, inverse relation between these variables, such that exposure to externalizing peers was more common at lower levels of social play (see Table III). This relation was qualified by a quadratic relation between the quadratic component of externalizing exposure and the linear component of social play. Children who had the lowest levels of externalizing peer exposure tended to be frequently engaged in social play, spending over half of their time in social play ($M = .58$, $SD = .16$). Social play was less common among children with moderate levels of externalizing peer exposure ($M = .35$, $SD = .18$). For children with the most externalizing peer exposure, social play was moderately likely ($M = .43$, $SD = .13$). Thus, we controlled for observed social play in all subsequent analyses.

Predictors of Exposure to Externalizing Peers: Testing the Homophily Hypothesis

We conducted two sets of analyses designed to estimate the degree to which homophily was a significant force behind young children's exposure to externalizing peers. First, we computed a series of hierarchical regressions examining the extent to which each of several aspects of externalizing and socially competent behaviors, measured at the start of the fall semester (T1), predicted boys' and girls' tendencies to associate with externalizing peers over the course of the fall semester (T2). After proportion of observed social play was entered as a covariate, centered terms for the relevant T1 predictor and sex were entered, followed by the multiplicative interaction term (i.e., T1 predictor by sex; as recommended by Aiken & West, 1991). As shown in Table IV, a significant positive regression coefficient was obtained for T1 observed negative emotion, and no interaction with sex qualified this relation. Additionally, we obtained significant sex by activity level and sex by positive emotion interactions. A breakdown of these interactions revealed that observed activity level was positively related to externalizing peer exposure for boys ($\beta = .57$, $p < .001$) but unrelated to externalizing peer exposure for girls ($\beta = .22$, *ns*). Similarly, observed positive emotion was positively related to externalizing peer exposure for boys ($\beta = .38$, $p < .01$) but unrelated to externalizing peer exposure for girls ($\beta = -.06$, *ns*).

Next, we conducted follow-up hierarchical regression analyses, regressing exposure to externalizing peers on all variables that were related to exposure in the first set of analyses—observed activity level, observed negative emotion, and observed positive emotion for boys and observed negative emotion for girls. Our goals for this analysis were (1) to estimate the overall proportion of variance in exposure to externalizing peers that was due to children's own behavior and (2) to compare the relative importance of each behavioral predictor in

influencing children's exposure to externalizing peers (for boys). Due to the different patterns that emerged by sex, analyses were conducted separately for boys and girls. After controlling for social play in Step 1, the addition of T1 activity level, negative emotion, and positive emotion explained 22% of the variance in T2 exposure to externalizing peers for boys, $F(3, 66) = 6.60, p < .001$. Only activity level ($\beta = .39, p < .05$) made a significant unique contribution to externalizing exposure. For girls, negative emotion accounted for 24% of the variance in T2 externalizing exposure, $F(1, 63) = 14.85, p < .001$. The standardized regression coefficient for this effect was $\beta = .45, p < .001$.

Effects of Exposure to Externalizing Peers: Testing the Peer Contagion Hypothesis

To test the peer contagion hypothesis, we conducted a series of hierarchical regressions with exposure to externalizing peers over the course of the fall (T2) predicting children's externalizing (teacher-rated aggressive behavior, teacher-rated hyperactivity, and observed negative emotion) and internalizing (teacher-rated anxiety) behaviors at end of the fall (T3). In each analysis, we tested for the effects of exposure on later behavior controlling for initial levels of that behavior. This procedure allowed us to examine the effects of exposure to externalizing peers on subsequent levels of children's behavior above and beyond their initial tendencies to evidence such behavior. Additionally, given our theoretical model of differential predictions for boys and girls, the moderational effects of sex were examined. Predictors were centered prior to entry in the analyses and prior to creation of the multiplicative interaction terms (Aiken & West, 1991; see Table V).

Exposure to externalizing peers was significantly related to teacher-rated aggressive behavior, after controlling for initial levels of aggression. However, significant effects of exposure on teacher-rated hyperactivity and anxiety were qualified by interactions with sex. A breakdown of these interactions indicated that exposure to externalizing peers was positively associated with hyperactivity ($\beta = .51, p < .001$) and anxiety ($\beta = .56, p < .001$) for girls, but not for boys ($\beta_s = .04$ and $.20, ns$, respectively).

Same- and Other-Sex Externalizing Peer Exposure

We also tested our hypotheses considering exposure to same- and other-sex peers separately. These analyses were conducted separately for boys and girls, permitting an exploration as to how patterns of exposure to same- and other-sex peers may vary for boys and girls. As expected, girls spent significantly more time with same-sex high externalizing peers ($M = .58, SD = .43$) than with other-sex high externalizing peers ($M = .34, SD = .35$), $t(66) = 6.62, p < .001$. However, boys spent as much time with externalizing girls as they did with externalizing boys ($M_s = .50$ and $.50, SD_s = .34$ and $.45$, for other-sex and same-sex peer exposure, respectively), $t(71) = .02, ns$. Same-sex and other-sex externalizing peer exposure were highly correlated for both boys and girls, $r_s = .71$ and $.75, p_s < .001$, respectively.

To determine whether exposure to same- and other-sex externalizing peers was related to tendencies toward sociability, we examined the relation between social play and exposure to same- and other-sex externalizing peers. There were significant curvilinear relations between social play and same-sex externalizing exposure, $F(2, 68) = 17.13$ and $F(2, 63) = 29.76, p_s < .001$, for boys and girls, respectively, and between social play and other-sex externalizing exposure, $F(2, 68) = 9.48$ and $F(2, 63) = 9.13, p_s < .001$, for boys and girls, respectively. In all cases, the pattern of findings mirrored those reported previously, and children with the greatest levels of externalizing peer exposure exhibited moderate rates of social play.

Findings from analyses testing the homophily hypothesis are presented in Table VI. In each hierarchical regression analysis, social play was entered in Step 1, and T1 observed activity level, observer-rated aggression, observed negative emotion, observer-rated social

competence, and observed positive emotion were entered in Step 2. Same-sex externalizing peer exposure and other-sex externalizing peer exposure served as criterion variables in separate analyses. For boys, the T1 variables explained approximately 19% of the variance in T2 same-sex externalizing peer exposure, but only activity level and social competence made unique contributions to exposure. The T1 variables explained even more variance (39%) in boys' exposure to other-sex externalizing peers. Again, both activity level and social competence made significant unique contributions. However, negative emotion also contributed to the prediction of other-sex externalizing exposure for boys.

A different pattern emerged for girls. That is, social competence and activity level did not emerge as significant predictors of girls' same-sex exposure. Instead, negative emotion was positively related to girls' exposure to externalizing girls. Additionally, aggression was inversely related to girls' same-sex externalizing exposure. This finding warrants some consideration because it appears to be a function of a suppression effect. That is, the zero order correlation between girls' T1 aggression and T2 same-sex exposure was $r = -.01$. However, once negative emotions and social play were controlled, aggression was negatively related to same-sex exposure. Negative emotion was also significantly related to girls' other-sex externalizing exposure. Furthermore, girls' positive emotion was inversely related to exposure to externalizing boys. The T1 variables together explained approximately 26% of the variance in girls' other-sex externalizing peer exposure.

Findings from analyses testing the peer contagion hypothesis are presented in Tables VII and VIII. It is notable that, within sex, the findings were consistent for both same- and other-sex exposure. That is, for boys, exposure to externalizing boys was unrelated to teacher-rated aggression, teacher-rated hyperactivity, observed negative emotion, and teacher-rated anxiety after controlling for prior levels of each of these variables. Similarly, there were no effects of exposure to externalizing girls on boys' externalizing and internalizing behaviors. In contrast, girls who were exposed to externalizing girls exhibited higher rates of teacher-rated aggressive behavior, teacher-rated hyperactivity, and teacher-rated anxiety even after prior aggression, activity level, and anxiety were controlled. The same pattern of effects was found for girls' exposure to externalizing boys, with girls exhibiting higher levels of aggression, hyperactivity, and anxiety after exposure to externalizing boys.

DISCUSSION

This study provides evidence of externalizing peer exposure effects in a low-risk sample of preschoolers and kindergarteners. Importantly, it appears that the effects of exposure to externalizing peers varied for young boys and girls. The substantive and methodological implications of these findings are discussed below.

The Homophily Hypothesis

Interactions with externalizing peers were not equally distributed across all young children; instead, some children interacted more with externalizing peers than did others. It is interesting that children who had the lowest levels of externalizing peer exposure were those who spent the most time engaged in social play (nearly 60% of their time). This suggests that the most social children were also selective in choosing play partners who were non-externalizing. In comparison, children who had the greatest levels of exposure to externalizing peers exhibited moderate levels of social play, spending about 40% of their time in peer interactions.

Although boys and girls had similar levels of externalizing peer exposure, the initial (T1) factors that brought boys into relatively frequent contact with externalizing peers were different than those that brought girls into relatively frequent contact with externalizing peers. For boys, being active and expressing positive emotion were associated with externalizing peer exposure.

Thus, factors that are typically associated with boys' normative and socially competent play played meaningful roles in determining boys' externalizing peer exposure (DiPietro, 1981; Fabes, 1994; Maccoby, 1998). Less support was obtained for the homophily hypothesis for boys, particularly with regard to exposure to externalizing boys, although negative emotion (in addition to activity level and positive emotion) was associated with boys' exposure to externalizing girls. This finding stands in contrast to the findings of most prior studies of the homophily hypothesis, in which aspects of externalizing behavior are commonly associated with exposure to externalizing peers (Espelage et al., 2003; Maccoby, 1998). Farmer et al., 2002; Farver, 1996). Consequently, it is unclear how to interpret it. Perhaps this finding is a function of the low-risk nature of the sample; that is, homophily effects for boys may be moderated by such factors as teacher-child ratio (which was high for the present sample) or overall level of externalizing behavior among classmates. Alternatively, this finding may be a function of children's developmental level, with homophily effects for boys becoming more common with age. Clearly, future research is needed to replicate this finding and caution in interpretation is warranted.

Nevertheless, it is interesting that, for the young boys in this sample, tendencies toward exuberant, enjoyable play activities were related to exposure to externalizing peers. Perhaps externalizing peers are seen by these boys as entertaining play partners, and are, therefore, preferred for social play. It is worth noting that the boys in this sample, on average, spent as much time with externalizing boys as they did with externalizing girls. This is surprising given that sex-segregation is a well-known feature of young children's social play (Leaper, 1994; Maccoby & Jacklin, 1987; Martin & Fabes, 2001). This does not seem to reflect a general tendency for children who prefer externalizing peers to be equally attracted to externalizers of both sexes, as girls spent significantly more time with externalizing girls than they did with externalizing boys. Instead, what this finding may indicate is that young exuberant boys are drawn toward peers who exhibit similarly active and affectively charged behaviors, even if those peers are girls.

For the young girls in this sample, evidence of the homophily effect was stronger, with negative affect being the primary predictor of girls' externalizing peer exposure. Indeed, the relation between negative emotion and externalizing peer exposure was obtained in analyses of both same-sex and other-sex exposure. Further support for the importance of negative emotions in influencing girls' externalizing peer exposure came from the finding that positive emotions were inversely related to girls' exposure to other-sex externalizing peers. It is interesting for girls that aggressive behavior did not positively contribute to externalizing peer exposure; thus, some externalizing variables were more strongly related to exposure than were others. These findings were generally consistent with the homophily hypothesis and with a body of literature that suggests that externalizing peers often socialize with other externalizing peers (Espelage et al., 2003; Farmer et al., 2002; Farver, 1996).

It is worth noting that, across most homophily analyses, the percent of variance in externalizing exposure that was accounted for by children's own T1 behaviors was not large. This suggests that other factors, untested in this study, also contribute to children's tendency to affiliate with externalizing peers; these may include individual factors, such as temperamental characteristics; dyadic factors, such as shared interests; or systemic factors, such as rejection by non-externalizing peers. It would be interesting to see if this pattern changes with development as children's characteristics and tendencies are more likely and more accurately used by peers to make judgments about the qualities of potential interactional partners (Rubin, Bukowski, & Parker, 1998).

The Peer Contagion Hypothesis

The effects of externalizing peer exposure on children were more negative for girls than for boys. For girls, exposure to externalizing peers was related to higher levels of aggressive behavior, hyperactivity, and anxiety at the end of the fall semester. That peer exposure negatively affected young girls in these ways may be cause for concern, particularly given that those girls who were most likely to be exposed exhibited relatively high levels of externalizing behaviors at the start of the semester. In other words, exposure to externalizing peers seemed to enhance behavior problems for girls who were already exhibiting some problems at the outset. Additionally, it is worth noting that exposure to externalizing peers was related to anxiety, as well as externalizing behaviors for girls.

These findings for girls also are noteworthy because few previous studies have specifically tested the peer contagion hypothesis in girls. Those that have done so reported that peer influence processes operate in similar ways for girls as they do for boys; however, extant studies have relied on adolescent samples (Poulin, Dishion, & Burraston, 2001; Storvoll & Wichstrom, 2002). To our knowledge, this is the first demonstration that exposure to externalizing peers can have negative (at least in the short-term) effects on young girls' functioning. This finding is relevant to conceptualizations of the developmental trajectory of aggression for girls and highlights the importance of considering the role that peers play in shaping girls' externalizing behaviors.

Exposure to externalizing peers appeared to be a less negative experience for the young boys, at least the low-risk young boys, in our sample. Although externalizing peer exposure was associated with boys' later aggression in analyses with both male and female externalizing peers, when findings were broken down by same- and other-sex exposure, this effect was not replicated. Additionally, there were no relations between externalizing peer exposure and any other externalizing or internalizing index. Thus, the effects of exposure to externalizing peers were fairly circumscribed, and externalizing peer exposure had relatively (compared to girls) minimal impact on subsequent maladjustment for boys. Although this is consistent with the homophily findings for boys, it contradicts the findings of previous studies that have shown that exposure to externalizing peers negatively affects multiple domains of functioning for older boys (e.g., Dishion et al., 1996).

Such patterns of findings may reflect different social processes inherent in young girls' and boys' play groups, such that externalizing behavior (and exposure to externalizing peers) carries different meanings for girls and boys. Thus, young boys' relative resilience in the face of externalizing peer exposure may be a function of the social interaction styles that characterize boys' playgroups. Active play styles are common among young boys, who often interact physically with one another in groups of multiple peers (Fabes, Martin, & Hanish, 2003). The normative nature of relatively externalizing interactions for young boys may lessen the impact that such exposure has. In contrast, exhibiting or being attracted to externalizing behaviors is less normative for girls. Thus, externalizing girls may be different from most other girls, who tend to play more quietly and less aggressively, making exposure more salient (i.e., more impactful) for girls. Thus, the present findings lend some support for the "normative experience" hypothesis.

Methodological Issues

One unique feature of this study was that the sample as a whole was at low-risk for the development of antisocial behavior. Despite this, there was a range of externalizing behavior; some peers exhibited relatively higher levels of externalizing behaviors, and some children spent more time engaged in interactions with these peers. As such, the present findings speak to the generalizability of peer exposure processes across samples, although it is not clear

whether peer exposure processes are amplified in high- versus low-risk or in younger versus older samples. Because of the high teacher-child ratio in the children's classrooms and the low-risk nature of the sample, the intensity and frequency of externalizing peer exposure may be attenuated compared to what is likely to be seen in other settings; thus, effects may be stronger in higher risk samples or settings. Additionally, although we did not work with a clinical sample and clinically significant levels of behaviors problems cannot be inferred, the present findings raise issues that should be considered in the development of future intervention studies. In particular, it is important to consider how peers influence young children's externalizing behaviors, especially for young girls for whom peer exposure seemed to be particularly influential.

Examining exposure to externalizing peers in early childhood raises some methodological challenges. Because of young children's developmental level, the nature of their peer relationships and their ability to describe those relationships are less sophisticated than for older children. Consequently, the self-report methodologies that have often been used to assess peer exposure in older children and adolescents were not conducive to assessing peer exposure in this sample of young children. To overcome this limitation, we developed a new measure of exposure to tap this in young children. This method is particularly suited for use with observational data because they provide a relatively precise count of the number of times children interact with all possible play partners, although they may be adapted for use by researchers using teachers', parents', or others' estimates of the frequency of children's interactions with particular peers. What was not measured by this method, however, was the nature of the specific interactions that a child had with particular peers. Thus, it is unknown whether externalizing peers exhibited externalizing behaviors or negative affect during interactions with the target child (for example, see Fagot, 1985).

Additionally, interpretation of these findings should be made in the context of the study design. That is, although we used a short-term longitudinal design to test hypotheses, there was some overlap between T1 and T2 measurement periods and between T2 and T3 measurement periods. Thus, we recommend caution in making causal interpretations of these findings.

Concluding Comments

The findings of this study suggest that exposure to externalizing peers in young children is complex and depends on children's sex. Moreover, the finding that peer exposure effects operate in early childhood is fundamental to understanding peer exposure effects in older youth. That is, peer interactions in early childhood form the foundation upon which later peer interactions build. We obtained evidence for a transactional pattern of effects, most notably for girls. Clearly, young children are active agents in their own development, spending time with particular interactional partners and responding in particular ways to their peers, which then influences future interactions. Thus, we might expect that, as children get older, the relation between child functioning and exposure becomes stronger. One issue that is critical for future research to explore is the extent to which these transactional processes remain the same or become modified as children get older. Additional research that follows children over a longer period of time would be helpful in discerning developmental changes in patterns of peer exposure.

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References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage.
- Cairns RB, Cairns BD, Neckerman HJ, Gest SD, Garipey JL. Social networks and aggressive behavior: Peer support or peer rejection? *Developmental Psychology*, 1988;24:815–823.
- Capaldi DM, Stoolmiller M. Co-occurrence of conduct problems and depressive symptoms in early adolescent boys: III. Prediction to young-adult adjustment. *Development and Psychopathology*, 1999;11:59–84. [PubMed: 10208356]
- Cicchetti D, Rogosch FA. Editorial: Equifinality and multifinality in developmental psychopathology. *Development and Psychopathology*, 1996;8:597–600.
- DeRosier ME, Cillessen AHN, Coie JD, Dodge KA. Group social context and children's aggressive behavior. *Child Development*, 1994;65:1068–1079. [PubMed: 7956465]
- DiPietro JA. Rough and tumble play: A function of gender. *Developmental Psychology*, 1981;17:50–58.
- Dishion TJ, Eddy JM, Haas E, Li F, Spracklen K. Friendships and violent behavior during adolescence. *Social Development* 1997;6:207–223.
- Dishion TJ, Spracklen KM, Andrews DW, Patterson GR. Deviancy training in male adolescent friendships. *Behavior Therapy*, 1996;27:373–390.
- Dodge KA, Coie JD. Social-information-processing factors in reactive and proactive aggression in children's peer groups. *Journal of Personality and Social Psychology*, 1987;53:1146–1158. [PubMed: 3694454]
- Dodge KA, Price JM, Coie JD, Christopoulos C. On the development of aggressive dyadic relationships in boys' peer groups. *Human Development*, 1990;33:260–270.
- Espelege DL, Holt MK, Henkel RR. Examination of peer group contextual effects on aggression during early adolescence. *Child Development*, 2003;74:205–220. [PubMed: 12625446]
- Estell DB, Cairns RB, Farmer TW, Cairns BD. Aggression in inner-city early elementary classrooms: Individual and peer-group configurations. *Merrill Palmer Quarterly*, 2002;48:52–76.
- Fabes, R. A. (1994). Physiological, emotional, and behavioral correlates of sex segregation. In L. Campbell (Ed.), *Childhood sex segregation: Causes and consequences* (pp. 19–34). San Francisco: Jossey-Bass.
- Fabes, R. A., Martin, C. L., & Hanish, L. D. (2002). *The role of sex segregation in young children's prosocial behavior and disposition* Paper presented at the Groningen Conference on Prosocial Dispositions and Solidarity, Groningen, Netherlands.
- Fabes RA, Martin CL, Hanish LD. Young children's play qualities in same-, other-, and mixed-sex peer groups. *Child Development*, 2003;74:921–932. [PubMed: 12795398]
- Fabes RA, Shepard SA, Guthrie IK, Martin CL. Roles of temperamental arousal and gender-segregated play in young children's social adjustment. *Developmental Psychology*, 1997;33:693–702. [PubMed: 9232384]
- Fagot BI. Beyond the reinforcement principle: Another step toward understanding sex role development. *Developmental Psychology*, 1985;21:1097–1104.
- Farmer TW, Leung MC, Pearl R, Rodkin PC, Cadwallader TW, Acker RV. Deviant or diverse peer groups? The peer affiliations of aggressive elementary students. *Journal of Educational Psychology*, 2002;94:611–620.
- Farver JAM. Aggressive behavior in preschoolers' social networks: Do birds of a feather flock together? *Early Childhood Research Quarterly*, 1996;11:333–350.
- Fergusson DM, Swain-Campbell NR, Horwood LJ. Deviant peer affiliations, crime, and substance use: A fixed effects regression analysis. *Journal of Abnormal Child Psychology*, 2002;30:419–430. [PubMed: 12108769]
- Hanish LD, Eisenberg N, Fabes RA, Spinrad TL, Ryan P, Schmidt S. The expression and regulation of negative emotions: Risk factors for young children's peer victimization. *Development and Psychopathology*, 2004;16:335–353. [PubMed: 15487599]
- Harris JR. Where is the child's environment? A group socialization theory of development. *Psychological Review*, 1995;102:458–489.

- Keenan K, Shaw D. Developmental and social influences on young girls' early problem behavior. *Psychological Bulletin*, 1997;121:95–113. [PubMed: 9000893]
- Kendall, P. C., Henin, A., MacDonald, J. P., & Treadwell, K. R. H. (1998). *Parent ratings of anxiety in their children: Development and validation of the CBCL-A*. Unpublished manuscript, Temple University.
- Ladd GW, Profilet SM. The Child Behavior Scale: A teacher-report measure of young children's aggressive, withdrawn and prosocial behaviors. *Developmental Psychology*, 1996;32:1008–1024.
- Leaper, C. (1994). Exploring the consequences of sex segregation on social relationships. In C. Leaper (Ed.), *Childhood sex segregation: Causes and consequences* (pp. 67–86). San Francisco: Jossey-Bass.
- Lochman JE, The Conduct Problems Prevention Research Group. Screening of child behavior problems for prevention programs at school entry. *Journal of Consulting and Clinical Psychology*, 1995;63:549–559. [PubMed: 7673532]
- Luthar SS, Becker BE. Privileged but pressured? A study of affluent youth. *Child Development*, 2002;73:1593–1610. [PubMed: 12361321]
- Maccoby, E. E. (1998). *The two sexes: Growing up apart, coming together* Cambridge, MA: Belknap.
- Maccoby, E. E., & Jacklin, C. N. (1987). Sex segregation in childhood. In H. W. Reese (Ed.), *Advances in child development and behavior* (Vol. 20, pp. 239–287). Orlando, FL: Academic Press.
- Martin CL, Fabes RA. The stability and consequences of young children's same-sex peer interactions. *Developmental Psychology*, 2001;37:431–446. [PubMed: 11370917]
- Miller PM, Danaher DL, Forbes D. Sex-related strategies for coping with interpersonal conflict in children aged five and seven. *Developmental Psychology*, 1986;22:543–548.
- Parker, J. G., Rubin, K. H., Price, J. M., & DeRosier, M. E. (1995). Peer relationships, child development, and adjustment: A developmental psychopathology perspective. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology: Vol.2. Risk, disorder, and adaptation* (pp. 96–161). New York: Wiley.
- Patterson GR, Dishion TJ, Yoerger K. Adolescent growth in new forms of problem behavior: Macro- and micro-peer dynamics. *Prevention Science*, 2000;1:3–13. [PubMed: 11507792]
- Poulin F, Dishion TJ, Burraston B. 3-Year iatrogenic effects associated with aggregating high-risk adolescents in cognitive-behavioral preventive interventions. *Applied Developmental Science*, 2001;5:214–224.
- Rubin, K. H., Bukowski, W., & Parker, J. G. (1998). Peer interactions, relationships, and groups. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (pp. 619–700). New York: Wiley.
- Snyder J, Horsch E, Childs J. Peer relationships of young children: Affiliative choices and the shaping of aggressive behavior. *Journal of Child Clinical Psychology*, 1997;26:145–156.
- Snyder J, West L, Stockemer V, Gibbons S, Almquist-Parks L. A social learning model of peer choice in the natural environment. *Journal of Applied Developmental Psychology*, 1996;17:215–237.
- Sroufe AL. Considering normal and abnormal together: The essence of developmental psychopathology. *Development and Psychopathology*, 1990;2:335–347.
- Storvoll EE, Wichstrom L. Do the risk factors associated with conduct problems in adolescents vary according to gender? *Journal of Adolescence*, 2002;25:183–202. [PubMed: 12069434]
- Strayer FF, Santos AJ. Affiliative structures in preschool peer groups. *Social Development*, 1996;5:117–130.

Table 1

Scale Descriptives for T1, T2, and T3 Variables

Variable	Scale range	<i>M</i>	<i>SD</i>	Skewness
A. Time 1 variables				
Observed activity level	1–4	2.23	0.18	–1.58
Observer-rated aggression	1–7	1.98	0.75	0.99
Observed negative emotion	1–4	1.08	0.06	1.49
Observer-rated social competence	1–7	4.86	0.84	–0.58
Observed positive emotion	1–4	1.64	0.19	0.16
Observer-rated sad/anxious	1–7	2.31	0.74	1.32
B. Time 3 variables				
Teacher-rated aggression	1–5	2.19	0.89	0.48
Teacher-rated hyperactivity	1–3	1.61	0.56	0.73
Observed negative emotion	1–4	1.07	0.06	2.16
Teacher-rated anxiety	1–3	1.36	0.33	1.50
C. Exposure variables				
Teacher-rated externalizing	1–4	1.96	0.77	0.76
T2 Exposure to externalizing	N/A	3.70	4.36	1.56

Table II
Comparison of Externalizing and Nonexternalizing Children

Variable	Externalizing	Nonexternalizing
Teacher-rated hyperactivity	2.20 (0.45) _a	1.46 (0.48) _a
Teacher-rated aggression	3.40 (0.46) _a	1.89 (0.70) _a
Observer-rated aggression	0.37 (0.19) _a	0.24 (0.14) _a
Observed positive emotion	1.43 (0.21) _a	1.53 (0.23) _a
Observed negative emotion	0.05 (0.03) _a	0.03 (0.02) _a

Note. Standard deviations are presented in parentheses. Means in the same row that share subscripts differ at $p < .05$.

Table III

Correlations Among All Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. T1 Act. level	—											
2. T1 Agg.	.42***	—										
3. T1 Neg. emot.	.32***	.55***	—									
4. T1 Soc. comp.	.16***	.08	-.11	—								
5. T1 Pos. emot.	.32***	.21*	-.03	.35***	—							
6. T1 Sad/anx.	.01	.33***	.45***	-.54***	-.15	—						
7. T2 Soc. play	.45***	.28***	.27***	.40***	.42***	-.33**	—					
8. T2 Exposure	.15	.08	.24**	.07	.03	.18*	-.24**	—				
9. T3 Agg.	.25**	.55***	.52***	.13	-.03	.12	.21*	.28***	—			
10. T3 Hyper.	.35***	.50***	.54***	-.19*	.06	.33***	.05	.34***	.60***	—		
11. T3 Neg. emot.	.24**	.47***	.63***	-.07*	.10	.40***	.13	.23***	.34***	.39***	—	
12. T3 Anx.	-.06	.02	.24**	-.21*	-.16	.21*	-.09	.37***	.23**	.27***	.26**	—

Note. T1 Act. Level = Time 1 Observed Activity Level. T1 Agg = Time 1 Observer-rated Aggression. T1 Neg. Emot. = Time 1 Observed Negative Emotion. T1 Soc. Comp. = Time 1 Observer-rated Social Competence. T1 Pos. Emot = Time 1 Observed Positive Emotion. T1 Sad/Anx. = Time 1 Observer-rated Sadness/Anxiety. T2 Soc. Play = Time 2 Observed Social Play. T2 Exposure = Time 2 Exposure to Externalizing Peers. T3 Agg. = Time 3 Teacher-rated Aggression. T3 Hyper. = Time 3 Teacher-rated Hyperactivity. T3 Neg. Emot. = Time 3 Observed Negative Emotion. T3 Anx. = Time 3 Teacher-rated Anxiety. Pairwise *ns* range from 127 to 137.

*
 $p < .05$.

**
 $p < .01$.

 $p < .001$.

Hierarchical Regressions Predicting Exposure to Externalizing Peers at Time 2 From Externalizing and Socially Competent Behavior at Time 1

Table IV

Variable and step	R ²	df	F	β
A. T1 Observed activity level				
1. Social play	.06	(1, 135)	8.17**	-.44***
2. Sex	.14	(3, 133)	7.14***	-.02***
Activity level				.42***
3. Sex $\times$ activity level	.17	(4, 132)	6.53***	.18*
B. T1 Observer-rated aggression				
1. Social play	.06	(1, 134)	8.40**	-.28**
2. Sex	.08	(3, 132)	3.92**	.01
Aggression				.16
3. Sex $\times$ aggression	.08	(4, 131)	2.94*	-.02
C. T1 Observed negative emotion				
1. Social play	.06	(1, 135)	8.17**	-.33***
2. Sex	.16	(3, 133)	8.70***	.06
Neg. emot.				.32***
3. Sex $\times$ neg. emot.	.17	(4, 132)	6.62***	-.06
D. T1 Observer-rated social competence				
1. Social play	.05	(1, 133)	7.50**	-.31
2. Sex	.09	(3, 131)	4.24**	.06
Social comp.				.16
3. Sex $\times$ social comp.	.10	(4, 130)	3.67**	.12
E. T1 Observed positive emotion				
1. Social play	.06	(1, 135)	8.17**	-.32***
2. Sex	.08	(3, 133)	3.73*	.04
Pos. emot.				.13
3. Sex $\times$ pos. emot.	.10	(4, 132)	3.84**	.17*

Note. Each panel denotes a separate analysis. Regression coefficients are presented from the last step of each model.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Hierarchical Regressions Predicting Children's Externalizing and Internalizing Behaviors at Time 3 From Exposure to Externalizing Peers at Time 2

Table V

Variable and step	R ²	df	F	β
A. T3 Teacher-rated aggression				
1. Social play	.31	(2, 133)	29.42***	.13***
T1 Aggression				.50***
2. Sex	.37	(4, 131)	19.40***	-.01
T2 Exposure				.26***
3. Sex $\times$ exposure	.38	(5, 130)	15.93***	-.09
B. T3 Teacher-rated hyperactivity				
1. Social play	.13	(2, 134)	10.33***	.01
T1 Activity level				.27**
2. Sex	.26	(4, 132)	11.35***	.24***
T2 Exposure				.27***
3. Sex $\times$ exposure	.28	(5, 131)	10.17***	-.15*
C. T3 Observed negative emotion				
1. Social play	.40	(2, 130)	43.47***	-.02
T1 Negative emotion				.62***
2. Sex	.41	(4, 128)	21.98***	-.05
T2 Exposure				.07
3. Sex $\times$ exposure	.41	(5, 127)	17.45***	.01
D. T3 Teacher-rated anxiety				
1. Social play	.04	(2, 124)	2.44	.06
T1 Sad/anxious				.15
2. Sex	.13	(4, 122)	4.72***	-.05
T2 Exposure				.29***
3. Sex $\times$ exposure	.16	(5, 121)	4.72***	-.18*

Note. Each panel denotes a separate analysis. Coefficients are presented from the last step of each model.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table VI
Hierarchical Regressions Predicting Time 2 Exposure to Same-Sex and Other-Sex Externalizing Peers for Boys and Girls

Variable and step	Boys				Girls			
	R^2	df	F	β	R^2	df	F	β
A. Same-sex exposure								
1. Social play	.02	(1, 68)	1.59	-.57***	.13	(1, 63)	9.03**	-.65***
2. T1 Obs. activity level	.21	(6, 63)	2.72*	.36*	.33	(6, 58)	4.73***	.16
T1 Obs.-rated aggression				-.06				-.30*
T1 Obs. Neg. emotion.				.08				.59***
T1 Obs.-rated soc. comp.				.28*				.24
T1 Obs. pos. emotion.				.14				.04
B. Other-sex exposure								
1. Social play	.08	(1, 68)	5.48*	-.84***	.03	(1, 63)	1.61	-.39**
2. T1 Obs. activity level	.47	(6, 63)	9.34***	.48**	.29	(6, 58)	3.98**	.16
T1 Obs.-rated aggression				-.21*				-.24
T1 Obs. neg. emotion.				.30*				.59***
T1 Obs.-rated soc. comp.				.35**				.25
T1 Obs. pos. emotion.				.23				-.24*

Note. Each panel denotes a separate analysis. Regression coefficients are presented from the last step of each model.

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

Table VII
Hierarchical Regressions Predicting Time 3 Outcomes From Time 2 Exposure to Same-Sex Externalizing Peers for Boys and Girls

Variable and step	Boys			Girls		
	R^2	df	F	R^2	df	F
A. T3 Teacher-rated aggression						
1. Social play	.33	(2, 68)	16.64***	.01***	(2, 62)	11.84***
T1 Aggression				.56***		.26***
2. Same-sex exposure	.36	(3, 67)	12.28***	.17	(3, 61)	.47***
B. T3 Teacher-rated hyperactivity						.35**
1. Social play	.16	(2, 68)	6.69**	-.27*	(2, 63)	.13
T1 Activity level				.51***		.27*
2. Same-Sex exposure	.17	(3, 67)	4.42**	.03	(3, 62)	.42***
C. T3 Observed negative emotion						
1. Social play	.50	(2, 65)	31.84***	.06***	(2, 62)	-.08***
T1 Neg. emotion.				.69***		.61***
2. Same-sex exposure	.51	(3, 64)	21.80***	.11	(3, 61)	.08
D. T3 Teacher-rated anxiety						
1. Social play	.10	(2, 60)	3.30*	-.09	(2, 61)	.25*
T1 Anxiety/sadness				.27*		.07***
2. Same-sex exposure	.11	(3, 59)	2.53	.12	(3, 60)	.47***

Note. Each panel denotes a separate analysis. Regression coefficients are presented from the last step of each model.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table VIII
Hierarchical Regressions Predicting Time 3 Outcomes From Time 2 Exposure to Other-Sex Externalizing Peers for Boys and Girls

Variable and step	Boys			Girls		
	R^2	df	F	R^2	df	F
A. T3 Teacher-rated aggression						
1. Social play	.33	(2, 68)	16.64***	.01***	(2, 62)	11.84***
T1 aggression				.57***		
2. Other-sex exposure	.34	(3, 67)	11.35***	.10	(3, 61)	17.82***
B. T3 Teacher-rated hyperactivity						
1. Social play	.16	(2, 68)	6.69**	-.22**	(2, 63)	3.74*
T1 Activity level				.46**		
2. Other-sex exposure	.17	(3, 67)	4.59**	.10	(3, 62)	9.17***
C. T3 Observed negative emotion						
1. Social play	.50	(2, 65)	31.84***	.05***	(2, 62)	17.55***
T1 Neg. emotion				.69***		
2. Other-sex exposure	.50	(3, 64)	20.99***	.04	(3, 61)	11.54***
D. T3 Teacher-rated anxiety						
1. Social play	.10	(2, 60)	3.30*	-.09	(2, 61)	1.00
T1 Anxiety/sadness				.26		
2. Other-sex exposure	.10	(3, 59)	2.24	.06	(3, 60)	7.44***

Note. Each panel denotes a separate analysis. Regression coefficients are presented from the last step of each model.

* $p < .05$.

** $p < .01$.

*** $p < .001$.