

Observations of Aggressive and Nonaggressive Children on the  
School Playground

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## Abstract

Naturalistic observations were made of 17 aggressive and 22 nonaggressive children in grades 1 to 6, filmed with video cameras and remote microphones on school playgrounds. Observers coded interactive behaviors, affective valence, and play states. Aggressive children displayed more verbal and physical aggression, more prosocial behaviors, and higher rates of interaction than nonaggressive children. The two groups spent similar time in solitary and group activities. Sequential analyses indicated that peers made similar initiations to aggressive and nonaggressive children, but aggressive children were more likely to respond antisocially. Aggressive children initiated more mixed behaviors (prosocial and antisocial) than nonaggressive children. Implications of these observations for understanding peer interactions of aggressive children are discussed.

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Longitudinal studies have demonstrated considerable individual stability in patterns of aggression from childhood to adulthood (e.g., Farrington, 1991). This stability is likely a function of continuity in both the child's constitution and environmental factors (Eron & Huesmann, 1990). Caspi, Elder, and Bem (1987) proposed that early personality styles are sustained through the progressive accumulation of their own consequences (cumulative continuity) and by eliciting maintaining responses from others during social interaction (interactional continuity). From this perspective, aggressive children's behavior patterns can be understood as transactional and supported by both their own behavioral styles (e.g., a lack of prosocial behavior and high levels of aversive behaviors) and the reactions they elicit from others (e.g., rejection; Patterson, DeBaryshe, & Ramsey, 1989). Within the elementary school context, social interactions with peers may both maintain and exacerbate the behavior problems of aggressive children.

Although there is currently a heightened concern for the development and consequences of aggressive behavior problems, few naturalistic studies exist of aggressive children's peer interactions. Observational studies are critical to elucidate the positive and negative behaviors that characterize and contribute to the peer relationship difficulties of aggressive children (Coie, Dodge, & Kupersmidt, 1990). The present study addresses two potential mechanisms which may shape peer interactions of aggressive children: the individual characteristics of aggressive children and reciprocity within peer interactions.

The first potential mechanism supporting antisocial behaviors relates to individual behavioral styles. Aggressive children may lack the essential prosocial skills for successful interactions within the peer group. Social skill deficits are evident in teacher ratings of aggressive

children (Tremblay, Loeber, Gagnon, Charlebois & LeBlanc, 1991; Walker, Shinn, O'Neill, & Ramsey, 1987). Laboratory observations indicate that aggressive boys initiate more verbal and physical aggression than average or nonaggressive boys (Dodge & Frame, 1982).

In contrast to laboratory studies, naturalistic observations of aggressive children's peer interactions do not suggest a complete lack of social skills. Walker et al. (1987), in observations of behavior on school playgrounds, found no differences in rates of positive social behaviors initiated by aggressive and nonaggressive children. Although the aggressive boys initiated more negative verbal behaviors, there were no differences in rates of negative physical behaviors initiated by aggressive compared to nonaggressive children. Dishion, Andrews, and Crosby (1995) noted that antisocial adolescent boys appear to be capable of positive interactions with their friends, although they reciprocate in negative interactions and tend to be coercive. These findings that aggressive children may possess prosocial skills are consistent with research indicating that aggressive children are not isolated, but are members of networks of similarly aggressive peers (Cairns, Cairns, Neckerman, Gest, & Garipey, 1988). In order to maintain membership within their social groups, aggressive children require a basic repertoire of social behaviors. Aggressive children may be at risk not because of a lack of prosocial behaviors, but because of deviant behaviors that emerge, in part, within peer interactions.

A second potential mechanism supporting antisocial behavior on the is that peers may be differentially negative to a aggressive children, thereby eliciting or maintaining their aggressive styles (interactional continuity). There is a well-documented relation between aggression and peer rejection (Coie et al., 1990). When confronted by rejection, aggressive children may respond aggressively. In laboratory play groups, Dodge, Coie, Pettit, and Price (1990) found that peers were more likely to act aggressively toward an aggressive than a nonaggressive boy. A similar pattern

emerged in playground observations: Peers directed significantly more negative verbal behaviors to antisocial than to non-antisocial boys (Walker et al., 1987). Nevertheless, peers are not the sole source of the problem: Both in the play groups and on the playground, aggressive boys initiated many more aggressive acts than they received from peers (Dodge et al., 1990; Walker et al., 1987). Hence there is likely an interaction between individual behavioral styles of aggressive children and the responses of peers.

Reciprocity in interactions is exemplified by the adage that aggression begets aggression. Contingencies in aggressive interactions have been well-documented (e.g., Hall & Cairns, 1984). Reciprocal aggressive interactions may be more characteristic of aggressive than nonaggressive children. When aggressive children attack, they may be more likely to receive a counterattack from peers than nonaggressive children. Similarly when attacked, aggressive children may be more likely than nonaggressive children to counterattack. Reciprocity in aggressive interactions was observed by Dodge and Frame (1982) in laboratory play groups. Boys who initiated aggressive behaviors were likely to be the objects of peers' aggression. A similarly high contingency in aggressive behaviors was identified in sequential analyses of boys' play group interactions (Dodge et al., 1990). In observations of adolescent boys interacting with a friend, Dishion et al. (1995) found that reciprocity in negative engagement or coercive processes distinguished the interactions of antisocial boys from those of comparison boys. Reciprocal aggressive interactions may comprise coercive processes in peer interactions similar to those observed in family interactions (Patterson et al., 1989). To date, researchers have not examined reciprocal interactions on the playground.

This observational study examined the mechanisms hypothesized to maintain aggressive behavior patterns on the school playground which reside within the individual aggressive child and in their reciprocal interactions with peers. First, it was expected that aggressive children would

initiate more antisocial and fewer prosocial behaviors than nonaggressive children. Secondly, it was expected that peers would direct more aggressive behaviors and fewer prosocial behaviors to aggressive as compared to nonaggressive children. Thirdly, we expected that both aggressive and nonaggressive children would match aggressive behavior with aggressive behaviors and prosocial behaviors with prosocial behaviors, but that aggressive children would be more likely to respond aggressively and less likely to respond prosocially to peers than nonaggressive children. Given the paucity of observational studies in which qualitative aspects of children's aggression have been analyzed (Coie, Dodge, Terry & Wright, 1991), this study makes a unique contribution in understanding the peer interactions of aggressive children in the naturalistic context of the school playground.

## Method

### Participants

Participants for this study comprised 39 children, 17 aggressive children (10 boys and 7 girls) and 22 nonaggressive children (14 boys and 8 girls), in Grades 1 to 6 in two elementary schools in a large metropolitan city. (Aggressive and nonaggressive groups did not differ by gender,  $\chi^2(1) = .09, p > .75$ .) Children's mean age was 9.4 years (range 6.7 to 12.8, SD = 2.0). Although aggressive children were slightly older (9.8 years) than nonaggressive children (9.1 years), the difference was not significant ( $t(37) = 1.11, p > .25$ ). Socioeconomic data were not available on individuals, but school statistics indicated that most children were from low- to middle-income families. Ethnicity of the participants, identified by teachers for matching purposes, reflected the diversity within the city: 43% Caucasian, 25% African descent, 14% Asian descent and 18% mixed or other ethnicity. Informed consent for filming was obtained from parents of all children in the study. Children provided assent to be filmed.

The 39 children in the present study were chosen from a larger sample of 74 children, as they had a minimum of 10 minutes of observation of a planned 20-minute sample at each of two phases of data collection, corresponding to before and after a social skills training program. There were no differences in observed behaviors of the children before and after social skills training (Pepler, Craig, & Roberts, 1995), hence data for these observation periods are collapsed for the analyses. Time observed did not differ between groups at either phase of data collection, multivariate  $F(2,36) = 0.22, p > .80$ . Children in the present study were observed for an average of 53 minutes ( $SD = 12.0$ ; range: 36 to 82 minutes). There were several reasons for incomplete data: sound transmission was unreliable during the first observation phase; 20 children entered the study at the second phase of data collection; 2 children did not assent to be filmed at one of the observation periods; and 4 children did not complete the study because they moved away from the school. To assess potential bias in attrition, we compared initial teacher and peer ratings of the children who remained in the observational sample with those who were dropped with a 2 (retention / attrition) by 2 (aggressive / nonaggressive) ANOVA. There were no significant differences between children with complete and incomplete data and no significant group by attrition interactions. Nonaggressive children who dropped out of the study were replaced with another teacher-identified nonaggressive child with a similar ethnic background.

Aggressive children were identified by their teachers for a social skills training program (Pepler et al., 1995). For the nonaggressive group, teachers nominated children who exhibited few aggressive and noncompliant behavior problems in the classroom. These children were matched to aggressive children on age, gender, and ethnicity. Group assignment was validated by comparing aggressive and nonaggressive children on both teacher and peer ratings. On the Teacher Report Form of the Child Behavior Checklist (Achenbach & Edelbrock, 1986), mean teacher ratings of

aggressive children's externalizing behavior problems were in the clinical range ( $M = 66.2$ ) and significantly higher than those for nonaggressive children ( $M = 43.2$ ),  $F(1,37) = 214.7$ ,  $p < .0001$ . Internalizing scores for aggressive children were in the normal range ( $M = 55.2$ ), but significantly higher than those of nonaggressive children ( $M = 45.9$ ),  $F(1,34) = 30.8$ ,  $p < .0001$ . Peer reputations were assessed with the Revised Class Play (Masten, Morison, & Pelligrini, 1985). Same-sex peers rated teacher-designated aggressive children ( $M = 5.09$ ) as being significantly more aggressive than nonaggressive children ( $M = -1.28$ ),  $F(1,37) = 35.4$ ,  $p < .0001$ .

### Observations and Procedure

Cameras were set up in classrooms overlooking the school playgrounds. During filming each focal child wore a wireless microphone while being videotaped during unstructured time on the playground (see Pepler & Craig, 1995 for details of the observation technology and procedures). According to procedures outlined by Altmann (1974), each focal child was observed for two ten-minute time periods at the two phases of data collection. The average durations of time observed for the two periods were 20.9 minutes ( $SD = 4.8$ ) and 32.2 minutes ( $SD = 12.4$ ), respectively. All observations on a focal child were coded and rates of behaviors were calculated to account for variability in observation times. Children were observed in random order, on two different days, over a three-week period at each of the schools.

The coding scheme was adapted from the Playground Code of Rusby and Dishion (1991). Definitions of coding categories are provided in Table 1. Videotapes were coded first for play states (e.g., onlooker, parallel, cooperative play). A second wave of coding provided a fine-grained analysis of interactive behaviors (e.g., verbal attack, rough and tumble play, physical aggression). Each behavior was coded for affective valence on a five-point scale from unrestrained positive to unrestrained negative. Valence was coded on a 5 point scale: 1 -- unrestrained positive, 2 -- positive,

3 -- neutral, 4 – negative, and 5 --unrestrained negative. Valence coding was based on nonverbal gestures, body posture, facial expressions, tone, volume, and inflections of speech. In addition to behaviors of the focal child, peer responses were recorded. Non-study children ("others") were coded using the generic categories of "same-sex peer" or "opposite-sex peer". "Staff" were coded as such, so that teacher interventions could be identified from the behavioral record.

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Insert Table 1 about here

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Observers were trained on both coding taxonomies using a computer program for real-time recording of interactions (Roberts, 1993). Coders, blind to group membership, were trained to a criterion of .60 kappa coefficient of agreement on a set of training tapes. Throughout the coding process, 25% of the tapes were randomly selected for reliability assessment and coded independently by one of the three coders. Because time-budget analyses (states) were of interest, identical events had to be coded within five seconds of each other in order to count as an agreement. Research on individual differences in reaction time suggests that this interval is reasonable and appropriate for two independent observers (Suen & Ary, 1989). Under this temporal constraint, percent agreements averaged 84% and 77% for state and event coding, respectively (kappas = .76 and .69). Reliabilities for the specific codes are presented in Table 1.

For some analyses, behavioral categories with similar valence codes were combined.

Prosocial behaviors included talk, touch, rough-and-tumble, and social interaction with valences of 1 (unrestrained positive), 2 (positive), or 3 (neutral). Antisocial behaviors included talk, touch, rough-and-tumble, and social interaction with valences of 4 (negative) or 5 (unrestrained negative), and verbal rejection, verbal attack, and physical aggression with valences from 1 to 5.

## Results

We begin by briefly considering age and gender trends in our data and then turn to results pertinent to the hypothesized mechanisms: individual behaviors and reciprocal interactions.

Individual behaviors were assessed by examining rates of antisocial and prosocial behaviors and proportion of time in play states. Reciprocal interactions were examined by sequential analyses of behaviors and responses by focal children and their peers.

Because multivariate techniques based on analyses of variance are sensitive to violations of normality (Hayes, 1988) and because rates and proportions are likely to be non-normally distributed, non-parametric tests were used to assess differences across groups (aggressive, nonaggressive; girls, boys). Binomial tests were used to assess the multivariate null hypothesis that all differences in a set of comparisons were 0.

Age and gender

As shown in Table 2, Spearman rank-order correlations indicated a marginal tendency for older children to be more frequently prosocial and less frequently rejecting than younger children. However, only 4 of 16 comparisons were significant at .10 or better (age,  $p < .07$  for  $\alpha = .10$ ; sex,  $p < .02$ ; across prosocial-antisocial domains:  $p < .055$ ; within antisocial domain:  $p < .02$ ), and binominal tests could not clearly reject the multivariate null hypothesis that all correlations were 0,  $p < .07$ .

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Insert Table 2 about here

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Age trends were found for play states. As shown in Table 3, younger children spent more time in solitary states and less time with peers than older children. Five of 10 comparisons were significant at .05; binominal tests rejected the multivariate null hypothesis,  $p < .0001$ .

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Insert Table 3 about here  
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Only one gender difference emerged for behaviors: girls engaged in positive-valence touching twice as frequently as boys (on average, once every 4.2 min. vs. once every 9.1 min. for boys); binomial tests rejected the multivariate null hypothesis,  $p < .02$ . In contrast, no clear gender differences emerged for states. Only 1 of 10 comparisons reached significance; binomial tests could not reject the multivariate null hypothesis,  $p > .18$ . Overall, therefore, girls and boys were similar in their behaviors and activities on the playground.

#### Individual behaviors

As can be seen from the rate data presented in Table 4, children in the aggressive group were more frequently antisocial than nonaggressive children. Overall, aggressive children averaged an antisocial behavior once every 1.8 minutes, whereas nonaggressive children were antisocial on average once every 2.9 minutes, Mann-Whitney  $U = 275$ ,  $p < .02$ . The aggressive group was more frequently antisocial than the nonaggressive group on three of eight specific behaviors: physical aggression (Mann-Whitney  $U = 265$ ,  $p < .03$ ), verbal attacks (Mann-Whitney  $U = 257$ ,  $p < .05$ ), and negative-valence talk (Mann-Whitney  $U = 254$ ,  $p < .06$ ); binomial tests rejected the multivariate null hypothesis,  $p < .01$ . On average, aggressive children engaged in physical aggression once every 6.6 minutes, in contrast to once every 11 minutes for nonaggressive children. Verbal attacks occurred on average once every 17 minutes in the aggressive group, but only once

every 49 minutes in the nonaggressive group. For aggressive children, negative-valence talk occurred on average once every 4 minutes; for nonaggressive children, once every 6 minutes. The two groups did not differ significantly in rates of verbal rejection of peers (once every 41 and 35 minutes for aggressive and nonaggressive children, respectively), negative-valence gossip (once every 32 and 40 minutes, respectively), negative-valence social interaction (once every 32 and 51 minutes, respectively), negative-valence touching (once every 244 and 323 minutes, respectively), or negative-valence rough-and-tumble play (once every 196 minutes in the aggressive group, but never observed in the nonaggressive group).

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 Insert Table 4 about here  
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Contrary to expectations, aggressive children were also more frequently prosocial than nonaggressive children. Overall, aggressive children were prosocial once every 1.01 minutes, whereas nonaggressive children were prosocial once every 1.24 minutes, Mann-Whitney  $U = 258$ ,  $p < .05$ . As evident in Table 4, most of this difference could be attributed to differences in positive-valence touching, which aggressive children initiated on average once every 4.7 minutes vs. once every 8.6 minutes for non-aggressive children (Mann-Whitney  $U = 279$ ,  $p < .01$ ; for the multivariate null hypothesis,  $p < .05$ ). Although the two groups did not differ significantly on other measures of specific prosocial behaviors (positive talking, positive gossip, rough-and-tumble play, and positive social interactions; all  $ps > .15$ ), it is noteworthy that trends favored the aggressive group in every case. There was no support for the view that aggressive children are less frequently prosocial than their nonaggressive counterparts.

Given the frequent co-morbidity of hyperactivity and conduct disorder (Hinshaw, 1993), we examined an index of overall activity, derived by summing rates across all prosocial and antisocial categories. Overall activity strongly differentiated the two groups: 14 of 17 aggressive children (82%) fell above the median on this measure, whereas 17 of 22 nonaggressive children fell below,  $\chi^2(1) = 13.65, p < .001$ , Cramer's  $V = .59$ . On average, aggressive children interacted with peers once every 39 seconds vs. once every 52 seconds for nonaggressive children.

Play States. Non-parametric tests were used to assess group differences in the proportion of time that children spent in each of 10 states, pooled over peer partners and time (see Table 5). There were no significant group differences ( $p < .05$ ) for the eight specific states and two summary aggregates, total solitary and total social. Therefore, there was no support in these data for the view that aggressive children are socially isolated.

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 Insert Table 5 about here  
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Across groups, an average of 71% of children's time was spent in social play (cooperative, fantasy, or parallel play) or in peer groups (together or together touching). Only 10% of children's time was spent alone (unoccupied, solitary, or onlooker). Remaining time was spent with teachers or was uncodeable due to the focal child or peer being out of view.

### Reciprocal Interactions

To assess interactions, frequencies at lag 0 (actions) and lag 1 (responses) were entered into log-linear analyses of group differences over two actions (prosocial, antisocial), and four responses (prosocial, antisocial, mixed and other). Log-linear analyses are recommended for assessing contingency in interactions (Bakeman & Quera, 1995). Two analyses were conducted to assess the

bidirectional nature of peer interaction. First, we examined the focal children's behaviors and the corresponding immediate responses of their peers. Secondly, we examined peers' behaviors directed to the focal children and the corresponding responses of the focal children.

Behaviors by focal children and responses by peers. The final log-linear model lack-of-fitness test indicated an acceptable fit to observed data,  $\chi^2(18) = 19.97$ ,  $p > .30$ . Aggregating across time, behaviors differed by group,  $\chi^2(1) = 14.93$ ,  $p < .001$ . As indicated in Table 6, aggressive children made proportionally fewer prosocial initiations to peers than did nonaggressive children (72% vs. 78% of all behaviors) and proportionally more antisocial behaviors (28% vs. 22%). These results are consistent with the rate data presented earlier. Rates from Table 4 indicate, for example, that in a 100-min. period, an average aggressive child would display 99 prosocial acts and 56 antisocial acts, or as proportions, 64% and 36%, respectively. An average nonaggressive child would display 81 prosocial acts and 35 antisocial ones in the same 100-min. period, for proportions of 70% and 30%, respectively. Therefore, aggressive children display a greater rate, but a lower proportion of prosocial behavior because their rates for all behaviors (antisocial and prosocial) are higher than those of nonaggressive children. It also follows, when comparing two groups across two categories, that if a group has the higher proportion in one category, it necessarily has the lower proportion in the other. Thus rates and proportions present somewhat distinct views of the same data.

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 Insert Table 6 about here  
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Despite a higher rate and greater proportion of antisocial behaviors in the aggressive group, peer responses did not significantly differ by group. (The action by response by group interaction

was nonsignificant,  $\chi^2(3) = 3.79$ ,  $p > .25$ ; for peer prosocial responses,  $z = 1.46$ ; for antisocial responses,  $z = 1.25$ .) Therefore, there was no support for the view that peers maintain aggressiveness by differentially responding to aggressive and nonaggressive children.

Across groups, there was a high degree of contingency between the actions of focal children and the responses of peers,  $\chi^2(3) = 401.37$ ,  $p < .00005$ , Cramer's  $V = .38$ . Two-thirds (68%) of all prosocial behaviors were followed by prosocial responses from peers,  $z = 17.09$ . In contrast, antisocial behaviors were likely to be followed by either an antisocial peer response (22%;  $z = 6.19$ ) or by a second behavior from the focal child (32%;  $z = 10.21$ ).

Our observations indicate that aggressive children may present ambiguous or conflicting social cues to peers. Aggressive children initiated 402 antisocial behaviors to peers; following 141 (35%) of these antisocial behaviors, the focal aggressive child did not wait for the peer to respond, but instead immediately initiated a prosocial behavior to peers. (These were coded as "mixed" initiations). Similarly, aggressive children made 1,025 prosocial initiations to peers; following 125 (12%) of these prosocial behaviors, the focal aggressive child immediately initiated an antisocial behavior. Overall, almost 1 in 5 of aggressive children's initiations (19%) were of this mixed type. Thus, it was not uncommon for peers to be confronted by an aggressive child who was both prosocial and antisocial within the same interaction sequence. In contrast, fewer than 12% of behaviors by nonaggressive children were of this mixed type,  $\chi^2(3) = 29.62$ ,  $p < .0001$ ;  $z = 4.50$ . ( $Z$  scores are the ratios of log-linear parameters to their standard errors, and test the extent to which cell values deviate from expected values.) Further sequential analyses indicated that peers made no consistent responses to the mixed behaviors of aggressive children.

Peers' behaviors and responses of the focal children. For the second log-linear model, peer initiations and focal children's responses were examined. The lack-of-fit likelihood ratio  $\chi^2(12)$

= 14.69,  $p > .25$ , indicating adequate fit to observed data. Peers made similar initiations to both aggressive and nonaggressive children. As shown in Table 7, prosocial behaviors comprised 80% of all peer behaviors to aggressive children and 80% of all behaviors to nonaggressive children. Like focal children, peers also made "mixed" initiations, i.e., followed antisocial behaviors with prosocial behaviors and visa versa. Mixed initiations occurred for 9% of all peer behaviors ( $z = 9.41$ ), and were directed slightly more to nonaggressive children (10%) than to aggressive children (8%;  $z = 2.27$ ). Aggressive and nonaggressive children appear to experience very similar social contexts, with peer prosocial behaviors out-numbering antisocial behaviors by a ratio of four to one.

There was a high degree of contingency between peer initiations and responses of focal children. Both aggressive and nonaggressive children responded to peers' prosocial behaviors with prosocial responses (65%;  $z = 12.65$ ) and to peers' antisocial behaviors with either antisocial responses (32%,  $z = 5.91$ ) or prosocial responses (31%,  $z = -12.65$ ),  $\chi^2(3) = 261.77$ ,  $p < .0001$ .

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Insert Table 7 about here

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### Discussion

A number of important findings emerged from these naturalistic observations of aggressive and nonaggressive children on the school playground. Although peers provided very similar social contexts for both groups, aggressive children engaged in higher rates of physical aggression, verbal attacks, and negative talk than nonaggressive children. In addition, antisocial behaviors constituted a higher proportion of their total behaviors. Contrary to expectations, aggressive children had higher rates of total prosocial behavior than nonaggressive children, and the two groups spent their time on the playground in similar ways. Sequential analyses revealed a high degree of reciprocity in peer

interactions: prosocial behaviors were met with prosocial behaviors, and antisocial behaviors were met with either antisocial or prosocial behaviors. Mixed initiations were most common in the aggressive group, and may represent an attempt to manage aggression by making escalating exchanges less likely. Finally, consistent with the co-morbid status of hyperactivity and conduct disorder, overall activity rates (prosocial + antisocial) distinguished the aggressive and nonaggressive children. We now turn to a consideration of these findings with reference to the hypothesized mechanisms.

#### Individual Behavioral Styles

The theoretical model of cumulative continuity suggests that behavioral difficulties of aggressive children may be maintained through consequences of their own behavioral styles (Caspi et al., 1987). Their lack of prosocial skills and reliance on aggressive problem-solving strategies are presumed to place aggressive children at risk for rejection and subsequent peer relations problems (Parker & Asher, 1987; Patterson et al., 1989). In the present study, teacher ratings were consistent with those of other studies which substantiate the social skills deficit hypothesis (Tremblay, et al., 1991; Walker et al., 1987). Although teachers rated aggressive children as exhibiting externalizing behavior problems in the clinical range, the playground observations only partially confirmed the social skill deficit hypothesis. On one hand, aggressive children did evidence deficits in that they had higher rates of antisocial behavior than nonaggressive children. On the other hand, aggressive children also initiated more prosocial behavior, specifically in the form of positive touching, than nonaggressive children. Although these touches were coded by observers as positive, peers may have experienced them as intrusive and potentially hostile. These perceptions would be consistent with Dodge's identification of reciprocal hostile attributional biases (Dodge & Price, 1994). Peers

may expect aggressive children to be hostile and, therefore, interpret an ambiguous touch as negative. Such attributional biases underlie interactional continuity.

Our observational data make it difficult to subscribe to a pervasive social skills deficit perspective on the problems of aggressive children. The aggressive children were significantly higher on our measure of total prosocial behavior and had (nonsignificantly) higher rates in all specific categories of prosocial behavior, not just positive touch. It is hard to escape the conclusion that, far from exhibiting a deficit, these aggressive children were just as prosocial as the nonaggressive children (at least for the behaviors sampled). If there is a social skills deficit, our data suggest that it is not in producing prosocial behaviors, but in managing aggressive ones, perhaps in the context of fitting into a dominance hierarchy or in managing a behavioral tempo generally higher than one's peers. Both of these individual behavior styles could contribute to the second putative mechanism -- interactional continuity.

### Reciprocal Interactions

The concept of interactional continuity suggests that the behavioral styles of aggressive children elicit maintaining responses from their peers. In our data, peers responded in similar ways to aggressive and nonaggressive children. In addition, although aggressive children initiated more antisocial behavior, they were generally not isolated from the peer group on the playground. Contrary to expectations, aggressive children appeared to be highly interactive, spending as much time interacting with peers as nonaggressive children. This high level of interaction is consistent with other playground observations (Serbin, Marchessault, McAffer, Peters, & Schwartzman, 1993; Walker et al., 1987), but inconsistent with laboratory observations. In their observations of play groups, Dodge et al. (1990) found that aggressive behavior was related to being disliked, which in turn related to subsequent isolation from the peer group. This discrepancy may be a function of the

play setting: The playground context provides a much wider choice of familiar social partners than a contrived play group. Although aggressive children may be disliked, rejected, and isolated by some members of the peer group, they appear to associate with at least a subset of children on the playground. A similar finding emerged in the research of Cairns and his colleagues with adolescents. They found that aggressive adolescents were as likely to be members of social clusters as nonaggressive adolescents and that the networks of aggressive adolescents generally comprised similarly aggressive peers (Cairns et al., 1988).

Socialization experiences within the peer group have been postulated to be an important mechanism which maintains and exacerbates aggressive behavior problems. The present observations elucidate possible processes operating within the peer milieu on the school playground. Although peer interactions appear to be generally positive, approximately a quarter of the behaviors were antisocial. The culture of the playground may be one in which children have learned to accept aggression as one of the strategies and hazards of everyday life, useful as a means for solving some social problems. This perspective of children's interactions was presented by Smith and Boulton (1990) in their discussion of rough-and-tumble play, aggression, and dominance. They note that children are basically manipulative within a general context of friendly social interactions. Our observations of generally positive social interactions peppered with antisocial behaviors are consistent with this perspective. These interactional styles suggest a need for a type of moral training or socialization to promote different strategies to achieve social approval (Smith & Boulton, 1990).

The present study highlights the importance of the social context of play. The school playground with unstructured interactions among school-aged peers may comprise a context in which children consolidate their use of aggressive interactional strategies. Huesmann and Eron

(1984) identified three conditions that support the learning of aggression: children have many opportunities to observe aggression, children are reinforced for their own aggression, and children are the objects of aggression. When these conditions are present, children learn that aggressive behavior is acceptable and appropriate and severe antisocial behaviors are more likely to develop (Huesmann & Eron, 1984). Our observations reveal many opportunities to use and observe aggression and few negative consequences for aggressive behavior. In a separate analysis of bullying on these playground tapes, teachers were observed to intervene in only 4% of bullying episodes (Craig & Pepler, 1996). Under these conditions, the unstructured social context of the school playground may be an ideal training ground for antisocial behaviors. To reduce this possibility, schools should increase playground supervision (Olweus, 1993) and set clear, consistent consequences for aggression for all children. Furthermore, when the ambient rate of aggression on a school playground is low, aggressive children may find it easier to maintain a prosocial orientation and be less primed to respond aggressively to defend themselves.

In summary, the present observations present a paradoxical picture of the social behaviors of aggressive children. Although they are generally consistent with other playground observations, they are somewhat inconsistent with laboratory observations. As expected, aggressive children exhibited higher rates of verbal and physical aggression than nonaggressive children. In addition, their generally higher behavioral tempo may make them more difficult for peers to contend with. On the other hand, aggressive children played with other children to the same extent and initiated more positive interactions than nonaggressive children. In future research, clarification of these paradoxical findings may be approached by multi-level assessment. First, individual characteristics of the aggressive children might elucidate differences in interaction styles. Secondly, analyses of the social cognitive processes associated with prosocial and antisocial behaviors of aggressive children

and the responses of peers might clarify the perceptions and interpretations which underlie interactions between the aggressive children and their peers. Aggressive behavior also needs to be placed in its natural contexts: the affiliation networks and dominance hierarchies within groups of familiar peers. Thirdly, the behavior of the peer group and the broader social context of the school playground merit close attention as they likely influence the nature and frequency of aggression. Teachers' behaviors and attitudes may relate directly to the frequency of teacher intervention to curb aggression. Finally, as research on bullying within schools is beginning to show, the general school climate relates to the incidence of aggression (Craig & Pepler, 1996; Stephenson & Smith, 1989).

We would like to acknowledge the limitations of the present research. Concerning prosocial behaviors, our coding taxonomy necessarily focussed on the cooperative behaviors that commonly occur on playgrounds. High rates of positive, cooperative social interactions are not incompatible with deficits in helpfulness, sharing, and responsiveness to others' emotional distress. Thus our finding that aggressive children are prosocial on the playground does not rule out prosocial deficits in other contexts with demands for other types of prosocial behavior. To maximize observation times, the sample has been restricted; therefore, we have not been able to examine fully individual differences and gender differences. The samples were restricted to a group of clinically aggressive children and a group of nonaggressive children. Finally, observations were conducted on playgrounds in a large Canadian city where lunch and recess times are unstructured playtimes with minimal adult supervision (approximately 1 adult per 100 children). The results, therefore, will not readily generalize to other school playgrounds where activities are structured or closely supervised.

In summary, these naturalistic observations of aggressive children have begun to uncover the complexities of the socialization experiences within peer interaction and the particular risks for aggressive children. Given the complexity and systemic nature of aggressive children's behavior

problems, interventions must take into account both cumulative and interactional continuity by targeting not only the behavioral problems of aggressive children, but also the social contexts in which they are developing.

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Table 1. Definitions for Observed Behaviors and States

<u>Behaviors</u>		<u>% agreement</u>
Talk	Audible verbal expression (not verbal rejection, verbal attack, and gossip)	81
Verbal Rejection	Verbal expression of rejection / exclusion to send away or exclude a peer	74
Verbal Attack	Personalized disapproval or negative statements about a peer.	75
Gossip	Audible verbal expression about a third person not present	76
Touch	Nonaversive physical contact, such as pat on shoulder, hug, linking arms.	79
Rough-and-Tumble	Play fighting or chasing with pretense and positive affect.	83
Physical aggression	Aversive physical contact, such as hit, kick, punch, hitting with an object.	75
Social interaction	Behaviors that are interactive, but not verbal such as laughing or gesturing.	80
<u>State of focal child</u>		
Unoccupied-Solitary	Focal not engaged in specific activity; behavior appears aimless	93
Solitary-Engaged	Focal by him/herself playing independently, not affected by others.	83
Onlooker	Focal actively watching others, in close proximity, but not interacting.	78
Parallel	Focal beside child doing same activity or with same materials, not interacting	82
Together	Focal with others, but not focused on game or common activity (e.g., walking, talking).	88
Together Touching	Focal with others as in "together", but touching for longer than 5 sec.	78
Cooperative Play	Focal in organized game or play with others, element of reciprocity, rules and/or roles.	82

Fantasy Play	Focal and peers assuming roles and/or using objects beyond literal interpretation (e.g., movie roles, using skipping rope for snake).	88
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Table 2. Spearman rank-order correlations between age, gender, and rates of behavior.

	1	2	3	4	5	6	7	8
<u>Demographic</u>								
1. Age	1.00	---	---	---	---	---	---	---
2. Sex	-.07	1.00	---	---	---	---	---	---
<u>Prosocial behaviors</u>								
3. Social	.38*	-.11	1.00	---	---	---	---	---
4. Talk	.19	-.15	-.02	1.00	---	---	---	---
5. Gossip	.13	.07	.12	.11	1.00	---	---	---
6. Touch	.24	.54***	.04	-.02	.12	1.00	---	---
7. Rough & Tumble	-.01	-.16	.09	-.15	.03	-.12	1.00	---
8. Total Prosocial	.31+	.07	.32*	.79***	.44**	.33*	.01	1.00
<u>Antisocial behaviors</u>								
9. Social	-.08	-.25	.39*	.08	-.14	-.05	-.04	.11
10. Talk	-.07	.05	.18	-.15	-.42**	.02	-.30*	-.23+
11. Gossip	.07	.17	-.03	.05	.46*	.09	.04	.16
12. Reject	-.40*	-.03	-.23+	-.16	-.24+	-.16	.11	-.38**
13. Verbal Attack	.14	-.13	.15	-.16	-.28*	.08	-.07	-.15
14. Touch	.02	.18	-.08	.17	-.13	.00	-.00	.08

(table continues)

1 2 3 4 5 6 7 8

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Antisocial behaviors (con't.)

15. Rough & Tumble	-.19	.21	.00	-.09	.12	.04	-.01	-.04
16. Attack	-.05	-.19	.12	-.08	-.39**	.11	.09	-.09
17. Total Antisocial	-.05	-.07	.22	-.11	-.46**	.05	-.12	-.17

Total activity

18. Total Active	.29+	.05	.36*	.53***	.07	.33*	.05	.66***
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9 10 11 12 13 14 15 16

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Antisocial behaviors

9. Social	1.00	---	---	---	---	---	---	---
10. Talk	.15	1.00	---	---	---	---	---	---
11. Gossip	-.10	-.05	1.00	---	---	---	---	---
12. Reject	.11	.12	-.04	1.00	---	---	---	---
13. Verbal Attack	.20	.61***	.02	-.13	1.00	---	---	---
14. Touch	-.03	.30*	.09	-.06	.23+	1.00	---	---
15. Rough & Tumble	.10	.23+	.15	.25+	.18	.45**	1.00	---
16. Attack	.45**	.48**	-.14	.29*	.52***	.17	.23+	1.00
17. Antisocial	.40**	.88***	-.01	.26+	.69***	.28*	.26+	.77***

(table continues)

9 10 11 12 13 14 15 16

---

Total activity

18. Total Active .33\* .42\*\* .22+ -.14 .39\*\* .31\* .20 .47\*\*

17 18

17. Antisocial 1.00 ---

18. Total Active .55\*\*\*1.00

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Notes. + $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

Table 3. Spearman rank-order correlations between age, gender, and play states

	1	2	3	4	5	6	7	8	9	10	11	12
1. age	1.00	---	---	---	---	---	---	---	---	---	---	---
2. sex	-.07	1.00	---	---	---	---	---	---	---	---	---	---
3. Unoccupied	-.29+	-.39*	1.00	---	---	---	---	---	---	---	---	---
4. solitary	-.39*	-.17	.31+	1.00	---	---	---	---	---	---	---	---
5. onlooker	-.13	.02	.37*	.15	1.00	---	---	---	---	---	---	---
6. parallel	-.46**	-.06	.43**	.44**	.26	1.00	---	---	---	---	---	---
7. together	.26	.10	.13	-.16	.10	-.13	1.00	---	---	---	---	---
8. touching	-.12	.26	.08	.17	.10	.10	.31+	1.00	---	---	---	---
9. cooperative	.17	.23	-.63***	-.13	-.27+	-.38*	-.53***	-.25	1.00	---	---	---
10. fantasy	-.42**	-.19	.17	-.07	-.21	-.14	-.13	-.22	-.13	1.00	---	---
11. Tot. Solitary	-.40*	-.21	.78***	.51***	.71***	.47**	.08	.14	-.49**	.03	1.00	---
12. With peers	.44**	.35*	-.65***	-.42**	-.48**	-.52***	.20	-.04	.58***	-.08	-.69***	1.00

Notes. + $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . Tests are two-tailed. For sex, girls = 1, boys = 0.

Total Solitary is an aggregate variable summing across time for state codes unoccupied, solitary and on-looker. With peers is an aggregate variable summing across time for codes 6 (parallel play) through 10 (fantasy).

Table 4. Means (and Standard Deviations) for behaviors per minute of interactive behaviors on the playground.

	Aggressive (N= 17)		Nonaggressive (N=22)	
<u>Prosocial behaviors</u>				
Talk (valence 1-3)	.50	(.15)	.46	(.19)
Gossip (valence 1-3)	.09	(.11)	.09	(.07)
Touch (valence 1-3)	.21	(.12)	.12	(.09)
Rough & tumble (valence 1-3)	.10	(.07)	.08	(.07)
Social interaction (valence 1-3)	.09	(.06)	.07	(.05)
Prosocial (sum of above)	.99	(.27)	.81	(.21)
<u>Antisocial behaviors</u>				
Talk (valence 4, 5)	.26	(.18)	.16	(.12)
Gossip (valence 4, 5)	.03	(.03)	.03	(.03)
Verbal rejection (valence 1-5)	.02	(.03)	.03	(.04)
Verbal attack (valence 1-5)	.06	(.05)	.02	(.03)
Touch (valence 4, 5)	.004	(.009)	.003	(.011)
Physical aggression (valence 1-5)	.14	(.08)	.09	(.08)
Rough & tumble (valence 4, 5)	.005	(.021)	.000	(.000)
Social interaction (valence 4, 5)	.03	(.03)	.02	(.02)
Antisocial (sum of above)	.56	(.28)	.35	(.21)
<u>Total activity</u>				
Active (sum of all rates)	1.55	(.24)	1.15	(.28)

Note: Affective valence was coded on a 5-point scale: 1 = Unrestrained positive, 2 = Positive, 3 = Neutral, 4 = Negative, and 5 = Unrestrained negative.

Table 5. Means (and Standard Deviations) for time on the playground spent in each of ten states, as a proportion of total time observed.

State	Aggressive (N=17)	Nonaggressive (N=22)
Unoccupied.	.04 (.03)	.08 (.09)
Solitary	.01 (.03)	.02 (.02)
Onlooker	.02 (.03)	.02 (.03)
Parallel	.01 (.02)	.01 (.03)
Together	.22 (.12)	.24 (.16)
Together touching	.02 (.02)	.02 (.02)
Cooperative play	.43 (.17)	.40 (.21)
Fantasy play	.04 (.06)	.03 (.06)
Total Aggregate Solitary	.07 (.06)	.12 (.11)
Total Aggregate with peers	.72 (.16)	.71 (.13)

Note. Columns do not sum to 1 because some states and partners were uncodable.

Table 6. Frequencies of Focal Children's Behaviors and Peers' Responses.

Initiator	Action	Responses				Total
		Prosocial	Antisocial	Mixed	Other	
Aggressive	Prosocial	683	89	125	128	1025
Child to	Antisocial	119	80	141	62	402
Peers	Total	802	169	266	190	1427
Nonaggressive	Prosocial	843	106	82	179	1210
Child to	Antisocial	103	83	98	58	342
Peers	Total	946	189	180	237	1552
Peers to	Prosocial	618	166	45	129	958
Aggressive	Antisocial	68	82	49	37	236
Child	Total	686	248	94	166	1194
Peers to	Prosocial	779	138	80	184	1181
Nonaggressive	Antisocial	96	86	69	36	287
Child	Total	875	224	149	220	1468

Note. Mixed: actor antisocial behavior immediately following actor prosocial behavior, or visa versa