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Forms and Functions of Aggression During Early Childhood: A Short-Term Longitudinal Study

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Abstract. The school classroom and playground provide an important context for learning about young children's social interactions. A multimethod, multiinformant, short-term longitudinal study was conducted to investigate the utility of including school-based observational assessments of both form (i.e., physical and relational) and function (i.e., proactive and reactive) of aggressive behavior at school with a young sample during early childhood (132 children; $M = 44.37$ months; $SD = 9.88$). The study revealed low intercorrelations between observed proactive and reactive functions of aggression and low to moderate levels of stability. Based on 160 min of observation per child for an academic year, the findings revealed that boys are more physically aggressive to peers than are girls, whereas girls are more relationally aggressive than are boys. The results provide evidence for the differential association between aggression categories and future social–psychological adjustment constructs with particular relevancy for school contexts (i.e., peer rejection and student–teacher conflict).

Recently, school psychologists have called for more extensive research of young children's peer relationships and, in particular, relationally aggressive behavior at school (Cullerton-Sen & Crick, 2005; Leff & Lakin, 2005; Young, Boye, & Nelson, 2006). Aggressive behavior is defined as any behavior intended to hurt, harm, or injure another person

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(Coie & Dodge, 1998). More specifically, relational aggression, in which the relationship or friendship serves as the means of harm, is observed when malicious gossip, lies, or secrets are spread, as well as by intentionally ignoring (i.e., "silent treatment") or maliciously excluding a peer from an activity or group interaction (e.g., "You can't come to my birthday party" or "You are not my friend anymore"; Crick & Grotpeter, 1995). Recent reviews emphasize that school counselors and psychologists are better equipped to address increasingly complex peer relationship and adjustment problems when they understand and assess for relationally aggressive behaviors (Young et al., 2006). In addition, to facilitate this assessment, a call for the use of ecologically valid observational systems for use in the classroom and on the playground has also been raised by school psychologists (Leff & Lakin, 2005). To date, though, school and developmental psychologists have neglected the important early school years. Theorists have postulated that subtypes of aggressive behavior (i.e., physical and relational aggression) are present and salient during all developmental periods, including early childhood (for a review, see Crick & Zahn-Waxler, 2003). The majority of past developmental theory, methods, and research designs have concerned physical (i.e., using physical force or the threat of physical force as the means of harm) or verbal (i.e., verbal insults and mean names) aggression, and these empirical traditions are not necessarily applicable to the study of relational aggression in school settings (Crick & Zahn-Waxler, 2003).

The study of aggressive behavior during early childhood is an important endeavor given the salience of emerging peer relationships and friendships for the academic, social, emotional, and cognitive development of young children (Crick & Zahn-Waxler, 2003). The interest in early onset and the developmental course of aggression results in part from concerns about the stability of aggression across development (see (National Institute of Child Health and Human Development Early Child Care Research Network, 2004) and the developmental significance of early onset aggressive behavior (Moffitt, 1993). In addition, physical aggression is common during early childhood when emotion regulation and language capacities are not fully developed (Coie & Dodge, 1998). Currently a great deal is known about physical aggression (e.g., links with marital discord, coercive punishments, and reactive temperaments; see Coie & Dodge, 1998); however, despite major progress in recent years, there is still much to discover concerning the development of relational aggression at school during early childhood.

During the last few years researchers have established the salient role of relational aggression during early childhood (e.g., Ostrov & Keating, 2004). During early childhood, school-based research using teacher, peer, and occasionally observational methods have documented that boys are significantly more likely to display and receive frequent levels of physical aggression than girls, especially in the company of male peers; girls, on the other hand, are significantly more likely than their male peers to be identified as relationally aggressive, especially in the company of female peers (e.g., Bonica, Yeshova, Arnold, Fisher, & Zeljo, 2003; Crick, Casas, & Mosher, 1997; Hawley, 2003; McNeilly-Choque, Hart, Robinson, Nelson, & Olsen, 1996; Ostrov, 2006; Ostrov & Keating, 2004; cf. Hart, Nelson, Robinson, Olsen, & McNeilly-Choque, 1998; Kupersmidt, Bryant, & Willoughby, 2000; McEvoy, Estrem, Rodriguez, & Olson, 2003). Comparatively fewer studies have occurred in early childhood relative to middle childhood and adolescence, perhaps because of the relative difficulty in assessing young children's relationally aggressive behavior. For example, younger children often have limited language skills and may not always be valid and reliable informants, rendering self and peer assessments challenging and often of questionable utility (Crick, Ostrov, Appleyard, Jansen, & Casas, 2004).

Proactive and Reactive Aggression

One of the principal areas of inquiry within the field of aggression is based on the functions of aggressive behaviors in the con-

text of peer relationships. Psychologists have distinguished aggressive behaviors displayed to serve a goal-directed end (i.e., proactive aggression) and those displayed in response to a perceived threat and motivated by hostility or anger (i.e., reactive aggression; Dodge, 1991; Vitaro, Gendreau, Tremblay, & Oligny, 1998). Recently, there has been a call for the elimination of a dichotomous view of functional aggression types because of the conceptual and empirical overlap between the constructs and because a reliance on these constructs precludes an assessment of the multiple motives of aggression (Bushman & Anderson, 2001). The authors argued that a dimensional approach to the understanding of proactive and reactive aggression may be more useful than a categorical approach. Bushman and Anderson (2001) recognized that dichotomies often generate many conceptual and empirical issues and called for a more complex and general conceptualization of aggressive behavior. However, the authors do recognize the benefit of studying particular aggression function types, which is in keeping with a number of studies in schools across North America that have documented the divergent nature of the proactive and reactive aggression constructs. Past studies have revealed both discrete factor loadings (see Dodge & Coie, 1987; Poulin & Boivin, 2000) and discriminant validity (Crick & Dodge, 1996; Price & Dodge, 1989; Dodge, Lochman, Harnish, Bates, & Pettit, 1997; Hubbard, Dodge, Cillessen, Coie, & Schwartz, 2001; Hubbard et al., 2002; Vitaro et al., 1998; Waschbusch, Willoughby, & Pelham, 1998). Finally, during early childhood aggressive behaviors often may be classified as proactive in nature (i.e., to get a toy or object; Cummings, Iannotti, & Zahn-Waxler, 1989), and reactive aggression may be less common.

In a further attempt to test the utility of the proactive and reactive function types of aggression, researchers have argued that it is important to take into account both the functions (i.e., proactive and reactive) and the forms (i.e., physical and relational) of aggression (Little, Jones, Henrich, & Hawley, 2003; Little, Brauner, Jones, Nock, & Hawley, 2003; Prinstein & Cillessen, 2003). Proactive relational aggression would occur during early childhood peer contexts, for example, when a child tells a peer "I will not be your friend anymore unless you give me that toy." Reactive relational aggression would occur during early childhood peer contexts, for example, when a child retaliates with "You can't come to my birthday party," in response to being excluding from sitting at the snack table with other girls in her class or perhaps in response to being hit from a peer. With a more complex delineation it may be possible to see further benefits of these constructs, which would provide additional support for continuing to study proactive and reactive aggression as relatively independent constructs. These recent studies (Little, Jones et al., 2003; Prinstein & Cillessen, 2003) with early and late adolescents demonstrate some utility for exploring the role of both forms and functions of aggression for predicting social–psychological adjustment outcomes. However, to date these associations have not been explored in early childhood.

Despite the recent advances in the physical and relational aggression literature, collectively past proactive and reactive aggression studies are limited in several ways (see Little, Jones et al., 2003; Little, Brauner et al., 2003). First, all of the past studies on proactive and reactive functions of physical (and even relational aggression) have been conducted with middle childhood or adolescent samples (e.g., Coie & Dodge, 1998). Second, most studies, even those that include relational aggression assessments, are based on potentially biased self-report, parent, or teacher ratings and have not used observational methods (see Leff & Lakin, 2005; cf. Price & Dodge, 1989) or a multimethod, multiinformant approach (cf. Hubbard et al., 2001). Third, the past literature has neglected the role of the gender of both the perpetrator *and* victim in the development of these behaviors. Fourth, the range of potential outcome variables (i.e., social–psychological adjustment problems) has been limited in past studies and has not assessed adjustment problems that may be particularly problematic for academic performance (i.e., student–teacher relationship) in children.

Social Psychological Adjustment and Aggression Subtypes

Hundreds of studies have demonstrated the significant association between physical aggression and future adjustment problems (for a review see Coie & Dodge, 1998). To date only a few studies have explored possible links between relational aggression and social–psychological adjustment problems over time (see Crick & Zahn-Waxler, 2003). In general, work in the field has been limited by a theoretical orientation that has been called the "benign childhood" hypothesis, stating that girls are particularly resilient to disruption and distress during childhood, which is observed in a lower prevalence of externalizing problems (Crick & Zahn-Waxler, 2003, p. 729). The second component of current theories of early developmental psychopathology is that when girls do experience disorder, it is in the form of only internalizing problems (e.g., Keenan & Shaw, 1997). Recently, researchers have tested these theoretical assertions but in most case these adjustment assessments (i.e., peer rejection by classmates) in the Crick (1996) and Cillessen and Mayeux (2004) longitudinal studies were limited to middle childhood and early adolescence, an important but narrowly focused developmental period. These initial studies do show that testing the utility of relational aggression above and beyond the role of physical aggression is theoretically important for refuting the "myth of the benign childhood of girls" (Zahn-Waxler, 1993). Therefore, in the present early childhood investigation, peer rejection was included as an outcome to be replicated and extended to a younger school context.

The link between relationally aggressive behaviors and disruptions in teacher–child relationships has also been examined. Past research has documented that these close relationships serve as a protective factor leading to resilient outcomes even among aggressive youth (see Meehan, Hughes, & Cavell, 2003). Specifically, children who have close relationships with their teachers have higher rates of prosocial behavior and social competence during early childhood (Copeland-Mitchell, Denham, & DeMulder, 1997). Alternatively, children who have conflictual relationships with early childhood teachers often have problems in multiple domains (Pianta, Steinberg, & Rollins, 1995), including academic problems in kindergarten (Pianta & Stuhlman, 2004) and academic and achievement problems through eighth grade (Hamre & Pianta, 2001). Children who have a relationship with their primary teacher marked by conflict are also much more likely to receive a referral for special education services than their peers who have an open, accepting, and close relationship with their teacher (Pianta, 1997). These conflictual relationships are likely to stay somewhat stable across time (Hughes, Cavell, & Jackson, 1999) and are predictive of future social competence and peer preference (Hughes, Cavell, & Willson, 2001). For these reasons, children's peer behavior (i.e., functions of relational aggression) was tested as a predictor of future conflict in the student–teacher relationship, even when controlling for the role of respective physical aggression functions. In addition, the inclusion of these two outcome variables (i.e., peer rejection and student–teacher conflict) will permit tests of the hypothesis that proactive and reactive functions of relational aggression have unique statistical associations with indices of social–psychological adjustment.

To extend past studies, the current study had four main goals. The first was to assess the psychometric properties of a new school-based observational classification system that differentiates subtypes of physical and relational aggression by two common functions of aggression (i.e., proactive and reactive) during early childhood. In addition, to expand the study of relational aggression to younger ages, children as young as 30 months were included. The second goal was to test the short-term stability of these four categories during early childhood. The third major goal was to explore gender differences for these behaviors. The fourth goal was to test the unique associations between these aggression categories and future peer rejection and conflict within the student–teacher relationship.

In the present research, in keeping with past theory on physical and relational aggression (Crick & Grotpeter, 1995) in which children use gender-linked aggressive strategies to fulfill gender-specific social goals, it is hypothesized that similar gender effects will be seen when functions of aggression are assessed. That is, proactive and reactive relational and physical aggression categories will reflect gender differences documented in the aggression literature (see Coie & Dodge, 1998), but not previously tested with children in early childhood school contexts. Specifically, across the study, it is predicted that young girls will display more relational aggression than their male peers and young boys will deliver more physical aggression than their female peers regardless of the proactive or reactive category. In addition, it is predicted that girls will be more relationally aggressive to female peers than male peers, and boys will be more physically aggressive to male versus female peers during early childhood (Ostrov & Keating, 2004). It is predicted that proactive functions will be more frequent than reactive functions (Cummings et al., 1989). Consistent with the past physical aggression literature during early childhood (see Coie & Dodge, 1998) and the past relational aggression studies during middle childhood (e.g., Crick, 1996; Crick, Ostrov, & Werner, 2006), it is hypothesized that stability will be demonstrated for all four aggression categories.

It is hypothesized that proactive and reactive relational and physical aggression will be associated with future adjustment problems (Vitaro et al., 1998; cf. Little, Jones et al., 2003; Little, Brauner et al., 2003). Based on past research, it is expected that reactive and proactive functions of relational and physical aggression will be associated with unique outcomes (Crick & Dodge, 1996; Hubbard et al., 2001; Poulin & Boivin, 2000; Waschbusch et al., 1998). Given that prior research has not explored these questions during early childhood, these final questions are exploratory in nature. However, the two social–psychological adjustment variables that are included in the present study (i.e., peer rejection and student–teacher conflict) are included because each of these outcomes has been associated or hypothesized to be associated with relational aggression in the past (Crick & Zahn-Waxler, 2003; Cullerton-Sen & Crick, 2005). Based on research with older children, it is predicted that reactive functions of relationally aggressive behavior will predict adjustment problems above and beyond proactive aggressive behavior (e.g., Waschbusch et al., 1998). The present study will not explore the unique associations between physical aggression and adjustment outcomes to reduce the number of models evaluated and because the focus of the present study was to test if relational aggression had utility in the prediction of adjustment problems above and beyond functions of physical aggression. Thus, based on past findings with older children (e.g., Crick, 1996, Crick, Ostrov, & Werner, 2006), it is predicted that relational aggression function types will predict future social–psychological adjustment problems above and beyond the role of physical aggression. This finding could be important because it would imply that relational aggression may uniquely account for variance in the prediction of these adjustment problems and, therefore, intervention and prevention efforts to improve young children's social competence would presumably obtain higher effects by including assessments of both forms and functions of aggressive behavior.

Method

Participants

A total of 132 children (69 girls) attending two preschool centers in a large midwestern city participated in this study. The ongoing longitudinal study (see Crick, Ostrov, Burr et al., 2006) consisted of two time points separated by approximately 4 to 5 months and began during the fall (data were collected after children had at least 1 month to become familiar with the school and their peers). At Time 2 (spring of the same year), the sample consisted of 116 children (62 girls). Thus, Time 1 began in the fall (2002) and was 2 to 3 months in length, followed by a 4- to 5-month period in which no measures were collected, and then followed by another 2- to 3-month

Table 1
Summary of Sample Size and Measures at Each Time

Measure	Time 1	Time 2	Validity Sample (Time 3)
Sample size	132 (69)	116 (62)	66 (33)
Observations of proactive or reactive aggression	√	√	√
Teacher reports of physical and relational aggression	√	√	
Teacher reports of proactive or reactive aggression			√
Teacher reports of peer rejection		√	
Student–teacher conflict		√	

Note. The check mark indicates when each measure was collected. The number of girls is presented in parentheses.

assessment period in the spring (2003). A subgroup of the children (n = 29; 18 girls) continued participating in the study into the fall (2003) of a second year (Time 3) and these data are used only for assessing the validity of the observational methods. An additional 37 children (15 girls) were also added during the fall of the second year for the validity assessment. Thus, for validity purposes, observations of aggression were conducted and teachers completed reports on proactive and reactive aggression for 66 children (33 girls) at Time 3. The attrition rate from Time 1 to Time 2 (12%) was because of children changing schools or moving from the area. There were no differences on any key study variable (i.e., observations of relational or physical aggression, peer rejection or student–teacher conflict) between those 16 children who left the study and those who stayed in the study.

At the start of this study, the mean age of the children was 44.37 months (SD = 9.88, range = 30–48 months). The sample was 8% African American, 8% Asian American, 75% European American, 4% Latino, and 5% other ethnic backgrounds. Based on yearly income reported by parents and education level, children were from primarily middle-class backgrounds, with a majority of the families consisting of two adult caregivers. However, 29% of children's families were known to be living below the federal poverty level. Twenty-three percent of children were learning English as a second language. The overall parental consent rate was 73% and active written parental consent was obtained from all participating parents. This study was approved by the University of Minnesota's Institutional Review Board. Both schools were nationally accredited with similar contexts and demographics. That is, classrooms (n = 9) at both schools were multiage classrooms, with similar curriculum, head teacher (n = 9) experience or education (BA or MA as highest degree), class size (there were between 16 and 20 children per class), and child-centered educational philosophy. See Table 1 for a timeline of when each measure was collected. Head teacher packets were distributed in the middle of each assessment period and each teacher individually returned his or her forms in a sealed envelope to project staff. Teachers received a small honorarium (i.e., gift card) to compensate them for their participation and schools received a small yearly donation to facilitate continuing education efforts.

The present study is unique from past studies published with related data sets (Crick, Ostrov, Burr et al., 2006) in that the present study consisted of a secondary recoding of observational data to include proactive and reactive functions of both physical and relational aggression observations. The present study sample does not entirely overlap with the past published sample given that only 1 year of the research was used in the present study to maximize statistical power and to

avoid attrition issues that occurred across the entire study.

Measures and Procedure

Observations of aggression and victimization. A revised focal child observational procedure (Ostrov & Keating, 2004) was adopted to record the physical and relational aggression of the participants. Specifically, at each time point, eight independent 10-min observations during a 2- to 3-month period were collected for each child for a total of 160 min of observation per child and a total of 18,560 min (309 hr) of observations overall (plus five, 280-min of observations for validity purposes) for the present study. There were typically two observers present for classroom observations; occasionally three or four observers were present during playground observations. A total of 10 male and female observers were used for Times 1 and 2 (two observers were new at Time 2). Nine male and female observers, four of whom were new to the study, were used for Time 3. All observations were conducted live and no videotapes were used in the present study. During each 10-min assessment interval, which always occurred during free play, observers randomly selected a focal child and recorded in detail the focal child's engagement in the following mutually exclusive behaviors: (a) *Physical aggression*, defined as the use of physical force or threat of physical force to hurt, harm, or injure another child (e.g., hitting, shoving, kicking, pinching, pulling, punching, and taking objects with the intent to hurt or harm another person etc.); and (b) *Relational aggression*, defined as the removal, or threat of the removal, of the relationship as the means of hurting, harming, or injuring another child (e.g., verbally or nonverbally excluding from an activity; using friendship withdrawal; spreading rumors, gossip, or malicious lies; and ignoring by covering ears or silent treatment).

Consistent with past procedure, each time a separate and discrete behavior was observed the observer would record the behavior in full written detail (e.g., "Focal child hit a male peer in the stomach to get a teddy bear" or "Focal child kicked female peer on leg in response to being hit on head") under the representative category (e.g., physical or relational aggression; Ostrov & Keating, 2004). A break in time was needed to indicate one behavior from two (see Ostrov & Keating, 2004). For example, a child observed as saying, "You are not my friend and can't come to my birthday party," would only be counted as one event. A child who said to a peer, "You are not my friend," and 5 min later, after a clear break in time and in interaction, told the same or a different child, "You can't come to my birthday party," would be counted as two events. Observers also recorded the response and delineated the order of behaviors during the session. Observations were made with enough detail so that reliability checks could be conducted and behaviors could be compared. Observers were trained to recognize and rule out rough-and-tumble play (Pellegrini, 1989), which was identified by playful, friendly, and positive interactions without the intention to hurt (e.g., stayed together after the interaction, did not protest, and did not display negative affect). No more than one observation was conducted per child per day.

Observers were trained (observation manual and forms are available upon request to the first author) with videotapes from past studies (Ostrov & Keating, 2004; Ostrov, Woods, Jansen, Casas, & Crick, 2004) and with several days of live practice coding. To avoid observer drift, observers were assessed for reliability for the duration of each observation assessment period with different observers (Pellegrini, 2004). This study was conducted over a relatively long period of time and in a variety of settings to minimize some of the context specificity problems of observational research and to increase sampling opportunities (Pellegrini, 2004). In addition, observers spent a great deal of time in the school setting with a "minimally responsive stance," in which they controlled their nonverbal behaviors, movements around the room or playground, position in the room or playground, and interactions with the children. These procedures allowed the children to habituate to

the observers' presence (Pellegrini, 2004). Once reactivity levels were low, observations were initiated and observers stayed within earshot of the focal child while controlling their eye contact, body movements, and interactions with the child. When possible (i.e., observers could clearly hear and see the focal child), classroom observations were conducted from a visually shielded observation booth in the classroom to reduce reactivity levels. Reactivity levels (e.g., looks, comments, questions, or behaviors directed at the observer) were relatively low across the present study (e.g., range = 0–3, M = 0.50 per session; see Atlas & Pepler, 1998).

Coded behaviors were checked by the trainers for accuracy at the conclusion of the study and were summed within category. Behavior frequencies were first summed and then converted to reflect the number of completed sessions by dividing the total frequency counts by the number of sessions (4–8) that observations were collected for each child. Children with less than half of the possible observation sessions per time point (i.e., <4) were dropped from that particular time period of the study (i.e., this only affected two children in the study). At Time 1, 99% of the focal children had 8 sessions, at Time 2, 98% of the focal children had 8 completed observational sessions and at Time 3, 94% of the participants had 8 sessions (6% had 6 or 7 sessions). Thus a child with an original frequency count of 4 for physical aggression, indicating that 4 independent cases of physical aggression were observed during the 80 min of observations, would receive a converted score of 0.50 (i.e., 4 behaviors/8 sessions).

The observational measure has demonstrated acceptable psychometric properties in the past (see Ostrov, 2006; Ostrov & Keating, 2004). This observational system has been reviewed in the recent school psychology literature, judged to meet all psychometric standards of the field, and deemed appropriate for use in multiple contexts during early childhood (Leff & Latkin, 2005). Specifically, evidence for favorable interrater reliability has been demonstrated in past research for physical aggression (intraclass correlation coefficient [ICC] = .95), relational aggression (ICC = .93), and prosocial behavior (ICC = .90; Ostrov & Keating, 2004). Evidence for validity has also been established. For example, the association between observationally based relational aggression scores and those obtained via teacher reports on the Preschool Social Behavior Scale—Teacher Form was $r = .50$, $p < .01$, in the Ostrov and Keating (2004) study, and $r = .40$, $p < .01$, in an independent sample (Ostrov, 2006). In addition, observations of relational aggression during free play has tended to correspond to independent observations of relational aggression conducted during a semistructured task (i.e., $r = .48$, $p < .05$; Ostrov & Keating, 2004).

Reliability of physical and relational aggression observations. In the present study, two raters observed the same focal child for 15% of the time for reliability purposes across each time. Scores are reported across the year of the project for ease of communication. To assess interobserver reliability, ICCs were computed between the two raters (McGraw & Wong, 1996). Reliability coefficients were acceptable: physical aggression, ICC = .85, and relational aggression, ICC = .77. The manner in which the observations were collected was not amenable to kappa coefficients because the observers did not specifically record intervals when the aggressive behaviors were absent. The use of ICCs has been suggested in similar situations (see McGraw & Wong, 1996) and used in the past (e.g., National Institute of Child Health and Human Development Early Child Care Research Network, 2004; Ostrov, 2006).

Coding of proactive and reactive relational and physical aggression. Based on the past definitions (Dodge & Coie, 1987) and recent teacher, peer, and parent report measures (e.g., Crick & Dodge, 1996; Little, Jones et al., 2003; Poulin & Boivin, 2000), each behavior originally coded as physical or relational aggression was recoded, using the full written details originally recorded during the

observations, for the presence of four mutually exclusive categories (i.e., physical proactive aggression, physical reactive aggression, relational proactive aggression, and relational reactive aggression). Each behavior was also classified according to the gender of the victim (e.g., physical proactive aggression to a male).

For *proactive aggression*, reference to a specific goal, toy, object, resource, or social position was needed, and the behavior was not in response to a threat or retaliation for being victimized. *Reactive aggression* was based on an assessment of hostility, a threat or perceived threat based on the presence of specific victimization behaviors, or a hostile exchange based on previously recorded response codes. The order of behaviors was used to document that retaliation had taken place. Observers were trained to record the function of the aggressive behavior and to record the sequence of events when conducting live observations. To avoid errors, the observers did not label these behaviors as proactive or reactive and independent highly trained coders conducted a secondary coding to determine whether each original aggression behavior was proactive or reactive.

Reliability of proactive and reactive aggression. For 30% of the observations, at least two observers independently coded the same behaviors. Kappa (K) coefficients were calculated for each of the behaviors. Kappa coefficients could be calculated for these codes because these data were from a secondary coding procedure in which the coders indicated a precise code for each observed behavior. Analyses were conducted by time period and at the level of the target gender (e.g., proactive physical aggression to a male), but for ease of communication they are only reported for the total categories. For proactive physical aggression, K was >.69. For reactive physical aggression, K was >.63. For proactive relational aggression, K was >.64. For reactive relational aggression, K was >.68. Kappas above .60 are considered acceptable (Pellegrini, 2004) and therefore all reliability coefficients were acceptable.

Teacher Report of Relational and Physical Aggression

A teacher-rating measure of children's social behavior (i.e., Preschool Social Behavior Scale—Teacher Form; Crick et al., 1997) was used to assess the validity of the observation measures and was completed by the head teachers in each classroom. This instrument consists of 16 items, 6 of which assess relational aggression (e.g., "This child tries to get others to dislike a peer"); 6 of which assess physical aggression (e.g., "This child kicks or hits others"); and 4 of which measure prosocial behavior, which served as positive-toned filler items. Teachers respond to the items by rating on a 5-point scale how true each item is for each of their students. Evidence supports the favorable psychometric properties (i.e., internal consistency, factor analyses, and concurrent validity) of the Preschool Social Behavior Scale—Teacher Form (e.g., Bonica et al., 2003; Crick et al., 1997; Hart et al., 1998; Ostrov & Keating, 2004). In the present study, for relational aggression Cronbach's alpha was acceptable: .87 (Time 1) and .89 (Time 2). For physical aggression Cronbach's alpha was acceptable: .93 (Time 1) and .89 (Time 2).

Teacher Reports of Proactive and Reactive Aggression

To assess the validity of the observational codes, a new teacher measure (Preschool Proactive and Reactive Aggression—Teacher Report) was developed based on a 36-item adolescent self-report measure (Forms and Functions of Aggression Measure) of physical and relational aggression that includes reactive and proactive functions (Little, Jones et al., 2003). The present measure included 12 items, 3 items for each type of aggressive behavior: physical proactive aggression (e.g., "This child often hits, kicks, or pushes to get what s/he wants"), physical reactive aggression (e.g., "If other children anger this child, s/he will often hit, kick, or punch them"), relational proactive aggression (e.g., "To get what s/he wants, this child will

often tell others that s/he won't be their friend anymore"), and relational reactive aggression (e.g., "When this child is upset with others, s/he will often ignore or stop talking to them"). Teachers responded on a 5-point scale from (1) *Never or Almost Never True* to (5) *Always or Almost Always True*. Teachers completed reports on proactive and reactive aggression for 66 children at Time 3. For this study, Cronbach's alpha was acceptable for each behavior: physical proactive aggression, $\alpha = .88$; physical reactive aggression, $\alpha = .92$; relational proactive aggression, $\alpha = .88$; relational reactive aggression, $\alpha = .82$.

Teacher Reports of Social–Psychological Adjustment

Teacher reports of children's social adjustment were obtained with the peer rejection scale of the Preschool Social Behavior Scale—Teacher Form instrument (Crick et al., 1997). The peer rejection scale consists of 2 items and assesses rejection by same- and other-gender peers. Teachers respond to these items using the same response format described previously for the behavioral items. Values for these items are summed to indicate the level of rejection. Favorable psychometric properties for this scale have been demonstrated in prior research (Ostrov et al., 2004) and in the current study, with Cronbach's alpha = .90.

As a further index of adjustment outcomes uniquely related to the school context, the focal child's relationship with his or her teacher was measured with the Student–Teacher Relationship Scale (Pianta et al., 1995) at Time 2. This widely-used 28-item measure with acceptable psychometric properties is designed to be a quantitative measure of teachers' perceptions of their relationships with students (e.g., "This child and I always seem to be struggling with each other"). Only the conflict subscale was used in the present analyses to reduce the number of analyses conducted. Teachers respond to the items on this measure on a scale that ranges from 1 (*Definitely does not apply*) to 5 (*Definitely applies*). For this study, Cronbach's alpha was .85.

Results

Descriptive statistics were calculated for key study variables and are presented in Table 2. To examine the various research questions of the study, first validity correlations were conducted both concurrently (Time 3) and prospectively (Time 1 to 3) to assess predictive validity. Second, bivariate correlations were conducted at each time to assess the intercorrelations of proactive and reactive functions for each subtype of aggression (i.e., physical and relational) as well as the stability of the aggression types. To investigate gender and time differences, a series of repeated measure analyses of variance (physical and relational aggression models were run separately) were run with follow-up tests conducted as needed. Finally, a series of hierarchical regression models were computed to test for the unique effects of relational aggression categories (e.g., proactive relational aggression) in predicting future social–psychological adjustment (i.e., peer rejection and student–teacher conflict), above and beyond physical aggressive behaviors (e.g., proactive physical aggression).

Validity

Observations of relational aggression were correlated with teacher reports at both time points ($r = .34$, $p < .001$; $r = .42$, $p < .001$). For physical aggression, observations were moderately correlated with teacher reports at both time points ($r = .35$, $p < .001$; $r = .63$, $p < .001$).

The concurrent validity findings from the third time point indicates that there were moderate levels of association between teacher and observer reports for proactive and reactive physical aggression and in part for proactive relational aggression. Specifically, teachers and observers demonstrated moderate agreement for proactive physical aggression ($r = .40$, $p < .001$) and for reactive physical aggression ($r = .43$, $p < .001$). Teacher and observer informants did not agree regarding proactive relational aggression ($r = .15$, not significant) or reactive relational aggression ($r = -.06$, not significant). In an effort to

Table 2
Descriptive Statistics for Key Variables by Gender and Time

Behavior	Focal Boys			Focal Girls		
	Mean	*SD*	Range	Mean	*SD*	Range
Proactive physical aggression (O) T1	0.16	0.20	0–1.00	0.13	0.18	0–0.75
Reactive physical aggression (O) T1	0.09	0.15	0–0.75	0.02	0.05	0–0.25
Proactive relational aggression (O) T1	0.05	0.10	0–0.50	0.09	0.18	0–1.13
Reactive relational aggression (O) T1	0.02	0.07	0–0.38	0.03	0.08	0–0.38
Proactive physical aggression (O) T2	0.13	0.15	0–0.50	0.09	0.14	0–0.50
Reactive physical aggression (O) T2	0.05	0.13	0–0.75	0.01	0.04	0–0.25
Proactive relational aggression (O) T2	0.04	0.07	0–0.25	0.09	0.13	0–0.50
Reactive relational aggression (O) T2	0.01	0.04	0–0.25	0.02	0.07	0–0.50
Peer rejection (TR) T2	3.84	1.76	2–8	3.19	1.34	2–8
Student–teacher conflict (TR) T2	23.15	7.74	15–47	21.95	7.08	14–47
Proactive physical aggression (O) T3	0.15	0.11	0–0.63	0.07	0.10	0–0.38
Reactive physical aggression (O) T3	0.11	0.21	0–1.13	0.03	0.07	0–0.25
Proactive relational aggression (O) T3	0.03	0.07	0–0.25	0.10	0.17	0–0.63
Reactive relational aggression (O) T3	0.004	0.02	0–0.13	0.03	0.09	0–0.38
Proactive physical aggression (TR) T3	4.71	2.51	3–12	3.10	0.41	3–5
Reactive physical aggression (TR) T3	7.29	3.84	3–15	4.17	1.67	3–10
Proactive relational aggression (TR) T3	5.43	2.01	3–9	5.07	2.01	3–9
Reactive relational aggression (TR) T3	7.00	2.28	3–9	6.27	2.08	3–9

Note. Observational descriptive statistics are based on an average of the specific behavior types across the number of completed sessions (i.e., total frequency divided by the number of sessions out of eight possible sessions in which observational data was collected). O = observation; TR = teacher report; T1 = Time 1; T2 = Time 2; T3 = Time 3. At Time 1, $n = 132$; at Time 2, $n = 116$; at Time 3, $n = 66$.

explore the nature of these correlations, additional post hoc exploratory correlations were conducted separately by gender. For girls only, teacher reports and observed proactive relational aggression were significantly associated ($r = .36$, $p < .05$), but correlations for

Table 3
Stability Correlations and Intercorrelations for Aggression Types

	1	2	3	4	5	6	7	8
1. Proactive physical Time 1	—	.32***	.05	.05	.38***	.21*	.10	−.04
2. Reactive physical Time 1		—	.04	.03	.28**	.21*	−.08	−.02
3. Proactive relational Time 1			—	.33***	.04	.17	.13	.11
4. Reactive relational Time 1				—	.07	.10	.13	.56***
5. Proactive physical Time 2					—	.13	.03	−.07
6. Reactive physical Time 2						—	.15	.08
7. Proactive relational Time 2							—	.15
8. Reactive relational Time 2								—

Note. For Time 1 correlations, $n = 132$. For correlations at Time 2 and between Times 1 and 2, $n = 116$.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

boys ($r = -.04$) were not significant. For the association between observed and teacher-reported reactive relational aggression, post hoc correlations by gender did not reveal significant correlations for girls ($r = .22$) or boys ($r = -.25$).

The present study revealed evidence of predictive validity for all of the aggression categories (total observation scores were used for the four categories of aggression). Observed reactive relational aggression at Time 1 predicted teacher-reported reactive relational aggression at Time 3 ($r = .27$, $p < .05$). Observed reactive physical aggression at Time 1 predicted teacher-reported reactive physical aggression at Time 3 ($r = .62$, $p < .001$). Observed proactive relational aggression at Time 1 tended to predict teacher-reported relational aggression at Time 3 ($r = .24$, not significant). Given the nonsignificant correlation, exploratory post hoc analyses were conducted by gender. For girls only, observed proactive relational aggression at Time 1 predicted teacher-reported proactive relational aggression at Time 3 ($r = .43$, $p < .05$), but analyses for boys ($r = -.07$) were not significant. Observed proactive physical aggression at Time 1 was not significantly associated with teacher-reported proactive physical aggression at Time 3 ($r = .20$). Exploratory post hoc analyses were conducted by gender. For girls, observed proactive physical aggression at Time 1 was associated with teacher-reported proactive physical aggression at Time 3 ($r = .58$, $p < .001$), but the correlation was not significant for boys ($r = .16$).

Intercorrelations

Bivariate correlations were conducted between observed proactive and reactive aggression for both physical and relational aggression. These correlations were computed at the level of total behaviors (e.g., proactive physical aggression) and were conducted within time points (see Table 3). Intercorrelations between proactive relational and proac-

tive physical, as well as reactive relational and reactive physical, are also presented (see Table 3).

Analyses were also conducted to assess the degree of intercorrelation for proactive and reactive functions of relational and physical aggression for the teacher-report measure administered only at Time 3. Consistent with the past literature that almost exclusively relied upon the teacher-report method (see Poulin & Boivin, 2000), reactive and proactive physical aggression were highly correlated ($r = .79$, $p < .001$). In addition, reactive and proactive relational aggression were highly correlated ($r = .70$, $p < .001$). The findings were somewhat different when analyzed separately by gender. For boys, reactive and proactive physical aggression were highly correlated ($r = .81$, $p < .001$), whereas for girls the correlation was not significant ($r = .27$). For relational aggression and boys, the intercorrelation of proactive and reactive functions was high ($r = .75$, $p < .001$) and was similar for girls ($r = .64$, $p < .001$).

Stability of Aggression Categories

Stability coefficients were conducted for each of the four observed aggression behaviors. Findings were generally similar when controlling for age and thus only the unadjusted coefficients are reported (see Table 3). In sum, it appears that three of the four aggression types are significantly stable (range from $r = .21$, $p < .05$ to $r = .56$, $p < .001$). Although only proactive relational aggression was found not to be significantly stable, it is important to highlight that some of the stability correlations were small in magnitude (e.g., reactive physical aggression).

Gender and Time Differences

Physical aggression. To test for gender and time differences for functions of physical aggression, a 2 (focal child gender: boys and girls) × 2 (target child gender: male and female peers) × 2 (time) × 2 (function type: proactive physical or reactive physical) repeated measures analysis of variance was conducted with aggression frequencies as the dependent variable. Given the number of comparisons, a Bonferroni correction was performed to control for Type I error rate. However, the analyses were identical with and without the correction, so the uncorrected findings are presented.

A main effect for focal child gender emerged [$F(1, 113) = 6.89$, $p < .01$, $\eta^2 = .06$], which indicated that focal boys ($M = 0.05$; $SE = 0.01$) were more physically aggressive overall than focal girls ($M = 0.03$; $SE = 0.01$). A main effect for function type was found [$F(1, 113) = 48.03$, $p < .001$, $\eta^2 = .30$], with proactive physical aggression ($M = 0.06$; $SE = 0.01$) being more frequent than reactive physical aggression ($M = 0.02$; $SD = 0.01$). A main effect of target child gender was revealed [$F(1, 113) = 8.99$, $p < .01$, $\eta^2 = .07$], which indicated that males ($M = 0.05$; $SE = 0.01$) received more physical aggression than female peers ($M = 0.03$; $SE = 0.01$). A target child gender by focal child gender interaction was revealed [$F(1, 113) = 17.94$, $p < .001$, $\eta^2 = .14$]. For focal boys, a main effect of target child gender was found [$F(1, 52) = 17.31$, $p < .001$, $\eta^2 = .25$], indicating that focal boys directed more physical aggression to males ($M = 0.07$; $SE = 0.01$) than to female peers ($M = 0.03$; $SE = 0.01$). The effect was not significant for girls. It was also revealed that focal boys ($M = 0.30$; $SD = 0.29$) directed more physical aggression to male peers than did focal girls [$M = 0.10$; $SD = 0.19$; $F(1, 114) = 19.57$, $p < .001$, $\eta^2 = .15$].

Relational aggression. To test for gender and time differences for functions of relational aggression, a 2 (focal child gender: boys and girls) × 2 (target child gender: male and female peers) × 2 (time) × 2 (function type: proactive relational or reactive relational) repeated measures analysis of variance was run with aggression frequencies as the dependent variable. Given the number of comparisons, a Bonferroni correction was adopted to control for Type I error rate. However, the analyses were identical with and without the correction, so the uncorrected findings are presented.

Table 4
Correlations Between Aggression Types and Outcome Variables

Aggression Type	Peer rejection (TR) Time 2	STRS conflict (TR) Time 2
Proactive physical aggression (O) T1	.36***	.47***
Reactive physical aggression (O) T1	.30***	.43***
Proactive relational aggression (O) T1	.22**	.30**
Reactive relational aggression (O) T1	.08	.20*
Proactive physical aggression (O) T2	.19*	.43***
Reactive physical aggression (O) T2	.12	.19*
Proactive relational aggression (O) T2	.04	−.10
Reactive relational aggression (O) T2	.05	.23**
Peer rejection (TR) T2	—	.49***

Note. n = 116; O = observations; TR = teacher report; STRS = Student–Teacher Relationship Scale; T1 = Time 1; T2 = Time 2.
*$p < .05$.
**$p < .01$.
***$p < .001$.

A main effect for focal child gender was found [$F(1, 114) = 5.56, p < .05, \eta^2 = .05$], which indicated that focal girls ($M = 0.03$; $SE = 0.01$) were more relationally aggressive overall than were focal boys ($M = 0.01$; $SE = 0.004$). A main effect for function type was also found [$F(1, 114) = 27.19, p < .001, \eta^2 = .19$], which revealed that proactive relational aggression ($M = 0.03$; $SE = 0.004$) was more frequent than reactive relational aggression ($M = 0.01$; $SE = 0.004$). Finally, a function type by focal child gender interaction was found [$F(1, 114) = 5.28, p < .05, \eta^2 = .04$]. For focal boys, a main effect of function type emerged [$F(1, 53) = 7.29, p < .01, \eta^2 = .12$], indicating that boys displayed more proactive ($M = 0.05$; $SE = 0.01$) than reactive ($M = 0.01$; $SE = 0.004$) relational aggression. For focal girls, a main effect of function type also was found [$F(1, 61) = 21.72, p < .001, \eta^2 = .26$], revealing that girls displayed more proactive ($M = 0.02$; $SE = 0.01$) than reactive ($M = 0.01$; $SE = 0.004$) relational aggression. Finally, focal girls ($M = 0.19$; $SD = 0.24$) were more proactive relationally aggressive than were focal boys [$M = 0.09$; $SD = 0.14$), $F(1, 114) = 7.57, p < .01, \eta^2 = .06$].

Regression Models: Predicting Future Social-Psychological Adjustment

To test the bivariate association between aggression types and the two outcome measures (i.e., peer rejection and student–teacher conflict), a series of bivariate correlations were conducted (see Table 4). Most of the Time 1 aggression types were significantly associated with Time 2 adjustment outcomes. Next, to test for the unique role of aggression types in the prediction of these outcome variables, a series of hierarchical multiple regression equations were conducted in which Time 2 adjustment scores served as the dependent variable. In the first set of analyses (Models 1 and 2), observed proactive functions of relational aggression were entered first and observed reactive relational aggression was entered second to test the hypothesis that reactive relational aggression would add variance above and beyond the role of proactive relational aggression in predicting future adjustment problems. The third and fourth models test for the unique effects of proactive relational aggression when controlling for reactive relational aggression. In the second set of analyses (Models 5–8), observed function

types of physical aggression were entered at Step 1 and observed relational aggression function types were entered at Step 2 to test the prediction that proactive and reactive relational aggression (in separate models) would add significant information in the prediction of future adjustment problems (i.e., peer rejection and student–teacher conflict). Interaction terms with gender and predictors were entered in the regression models and were not significant, so they were dropped from further discussion. In all models, however, gender was entered at Step 1 and served as a covariate (see Table 5 for all eight regression models and findings).

In summary, it was found that proactive relational aggression predicted both future peer rejection and student–teacher conflict when controlling for gender and concurrent reactive relational aggression. Proactive relational aggression also uniquely predicted both future peer rejection and student–teacher conflict above and beyond the role of proactive physical aggression and gender. Reactive relational aggression uniquely predicted student–teacher conflict above and beyond the role of reactive physical aggression.

Discussion

The current study had four main goals for expanding the school and developmental psychology literatures. The first was to assess the reliability and validity of a new school-based observational classification system that differentiates subtypes of physical and relational aggression by two common functions of aggression (i.e., proactive and reactive) during early childhood. The second goal was to investigate the stability of these four categories, across an academic year, using observational methods during early childhood. The third major goal was to investigate gender differences across time for these behaviors with a more function-specific classification system. The fourth goal was to test the association between these categories and future adjustment problems, which included an assessment of both peer rejection and conflict within the student–teacher relationship.

It was documented that the observational coding methods were reliable, as indicated by two methods of interrater reliability. Given that the findings were consistent across time and across multiple coders, it is contended that the training and codes were sufficient to reliably capture these behaviors. In addition, the assessments of validity, using a newly adapted teacher-report measure that included reliable subscales of proactive and reactive relational and physical aggression, suggested that both teachers and observers significantly agreed in many cases. Despite the evidence for concurrent validity (i.e., significant and moderate agreement between teachers and observers) for global physical and relational aggression variables, the correlations for function types of aggression within the smaller validity sample (at Time 3) were not always significant. For example, proactive relational aggression was only significant for girls in the concurrent and predictive validity analyses, and reactive relational aggression was only significant in the predictive validity analyses. These findings await replication with a larger validity sample; however, they suggest that some caution may be warranted. In particular, proactive relational aggression may be challenging to observe among boys. Despite these cases, there were sufficient correlations to indicate that the overall observational scheme demonstrated preliminary evidence of validity. The present methods were based on theory (see Dodge, 1991) and prior empirical work that demonstrated acceptable factor loadings, internal consistency, and discriminate validity for the proactive and reactive aggression constructs (Dodge & Coie, 1987; Hubbard et al., 2002; Little, Jones et al., 2003; Little, Brauner et al., 2003; Poulin & Boivin, 2000). Thus, the observational methods and teacher reports appear to have acceptable psychometric properties, as suggested by a recent review in the school psychology literature (Leff & Lakin, 2005), and the new observational codes of aggressive functions appear to be reliable and to demonstrate preliminary evidence of validity.

The intercorrelations of observed proactive and reactive aggression provide further

Table 5
Hierarchical Regression Models: Unique Associations Between Aggression Types Predicting Future Adjustment Problems

Outcome, Step, Predictors	β	F, ΔF	R^2	ΔR^2
I. Student–Teacher Conflict Time 2				
1. Proactive Ragg Time 1	.32***	$F(2, 112) = 6.34, p < .01$	.10	
gender	−.13			
2. Reactive Ragg Time 1	.11	$\Delta F(1, 109) = 1.39$, ns		.01
II. Peer rejection Time 2				
1. Proactive Ragg Time 1	.26**	$F(2, 114) = 6.71, p < .01$	.11	
gender	−.24**			
2. Reactive Ragg Time 1	.00	$\Delta F(1, 113) = 0.00$, ns		.00
III. Student–teacher conflict Time 2				
1. Reactive Ragg Time 1	.21*	$F(2, 110) = 2.85, p < .06$	.05	
gender	−.09			
2. Proactive Ragg Time 1	.28**	$\Delta F(1, 109) = 8.05, p < .01$		.07
IV. Peer rejection Time 2				
1. Reactive Ragg Time 1	.09	$F(2, 114) = 2.94, p < .06$	.05	
gender	−.21*			
2. Proactive Ragg Time 1	.26**	$\Delta F(1, 113) = 7.10, p < .01$		.06
V. Student–teacher conflict Time 2				
1. Proactive Pagg Time 1	.46***	$F(2, 112) = 15.32, p < .001$	.22	
gender	−.05			
2. Proactive Ragg Time 1	.28***	$\Delta F(1, 109) = 11.64, p < .001$		.08
VI. Peer rejection Time 2				
1. Proactive Pagg Time 1	.34***	$F(2, 114) = 10.60, p < .001$	.16	
gender	−.17			
2. Proactive Ragg Time 1	.23**	$\Delta F(1, 113) = 7.33, p < .01$		.05
VII. Student–teacher conflict Time 2				
1. Reactive Pagg Time 1	.44***	$F(2, 110) = 12.53, p < .001$	.19	
gender	.05			
2. Reactive Ragg Time 1	.18*	$\Delta F(1, 109) = 4.38, p < .05$		.03
VIII. Peer rejection Time 2				
1. Reactive Pagg Time 1	.26**	$F(2, 114) = 6.57, p < .01$	.10	
gender	−.13			
2. Reactive Ragg Time 1	.07	$\Delta F(1, 113) = 0.61)$, ns		.01

Note. Pagg = physical aggression; Ragg = relational aggression; ns = not significant. Gender: Boys = 1, Girls = 2.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

evidence for the utility of these constructs, as they were found to be relatively independent with only slight to moderate correlations between the various subscales across the study. These findings were in contrast to past physical aggression research, which has documented quite substantial overlap between the proactive and reactive physical aggression

constructs (see Dodge & Coie, 1987; Vitaro et al., 1998). The present findings are the first to delineate the influence of both physical *and* relational aggression from these constructs (i.e., proactive and reactive functions of aggression) using observational data, which may explain the substantially lower correlations. In fact, the intercorrelations among the teacher report measure, in the validity subsample at Time 3, indicated much higher (as expected) effects. Interestingly, the finding that the proactive and reactive functions were either not correlated or demonstrated low correlations is consistent with the other known observational studies of proactive and reactive physical aggression (see Price & Dodge, 1989). Thus, the high level of intercorrelation between proactive and reactive functions of aggression may be an artifact of the measurement tool and shared method variance, and future observational methods are needed to replicate this effect. Future research is needed to replicate these findings with myriad informants and measurement techniques during early childhood.

In general, proactive behaviors were more common than reactive, consistent with past research, which has documented the salience of preferred objects and resources during early childhood play (see Cummings et al., 1989). In alignment with predictions, the assessments of gender differences indicated that girls were more relationally aggressive, regardless of the proactive or reactive function of the behavior. Similarly, boys were more physically aggressive, across both types of aggressive functions. Not surprisingly, these findings suggest that gender differences exist at the specific level of the recipient of the aggression (i.e., target child gender: male and female peers).

Knowing to whom the behavior was directed in this study was meaningful information. It was revealed that focal boys displayed more physical aggression to male peers than they did to female peers and focal boys delivered more physical aggression to male peers than did focal girls. In general, these findings provide further evidence of the importance of studying aggressive behavior at the level of the target child's gender (see also Ostrov & Keating, 2004; Pellegrini & Long, 2003). This further specificity in behavioral interactions is important because children during early childhood may learn which behaviors are more appropriate and effective for their own gender, and which tactics are most useful when interacting with other-gender peers. These issues should be explicitly addressed in future research during early childhood. In addition, future research should investigate the role that gender schemas and gender role identity play in the development of subtypes of aggressive behavior. Presumably, a gender difference in relationally aggressive behaviors would only be apparent after children have an understanding of their own gender membership and the social characteristics of their gender group. These developmental precursors have been assumed to exert an important influence, but they are unanswered questions.

Past research has documented stability for girls and boys in physically aggressive behavior (see Cairns, Cairns, Neckerman, Ferguson, & Gariepy 1989; Coie & Dodge, 1998) and for relational aggression over time for school-aged children (Crick, 1996; Crick, Ostrov, & Werner, 2006), but the developmental literature has not previously documented stability in these behaviors during early childhood. In addition, no known studies of stability have been conducted that have assessed, via observations, proactive and reactive functions of relational and physical aggression. This study revealed that low to moderate levels of stability emerged for proactive and reactive functions of physical aggression. Similar findings were revealed for reactive functions of relational aggression. However, stability was not seen for all behaviors. That is, proactive relational aggression was not significantly stable and future research is needed to explore why there was no continuity in the display of this particular type of aggression across the academic year. In general, the findings suggest that these behaviors are consistent across time and further indicate that without intervention these behaviors may continue. Moreover, these behaviors will most likely continue to be displayed and transferred to

different peer groups across time. To date, no long-term prospective studies have been conducted that track relational aggression from early childhood into middle childhood. The field of school psychology needs these types of studies to understand the continuity or lawful discontinuity that may be present for these behaviors.

In general, the findings, to some extent, revealed that proactive and reactive functions of relational aggression are uniquely associated with future adjustment problems. Specifically, analyses revealed that relational aggression categories predicted future adjustment problems (e.g., peer rejection and student–teacher conflict) above and beyond the influence of physical aggression categories, which is consistent with findings with school-aged samples (see Crick, 1996; Crick, Ostrov, & Werner, 2006). In addition, the analyses revealed that individual function types of relational aggression (i.e., proactive relational aggression) had unique predictive ability even when controlling for the other function type. These initial findings during early childhood await replication, but they indicate that functions of proactive and reactive aggression may have utility in the differential prediction of future adjustment problems (see Poulin & Boivin, 2000; Vitaro et al., 1998; cf. Bushman & Anderson, 2001; Waschbusch et al., 1998) for girls and boys. It is important to reveal that not all findings demonstrated unique effects—for example, both proactive and reactive relational aggression were associated with future levels of student–teacher conflict above and beyond the role of the respective physical aggression type. These findings suggest that the student–teacher relationship may also be harmed when girls display relational aggression at school. Given that children who have conflictual relationships with their teachers are at increased risk for a host of academic and behavioral problems as well as special education referral (Pianta, 1997), it is recommended that future research replicate and continue to explore this important finding. Despite some evidence for unique effects, caution should be exercised when interpreting these study findings, as there were several null effects that deserve attention. For example, reactive relational aggression was not predictive of future peer rejection, when controlling for the influence of proactive relational aggression and reactive physical aggression (in separate models). Reactive relational aggression also did not predict student–teacher conflict when controlling for proactive relational aggression. To reduce the number of analyses, proactive physical aggression was not entered as a covariate because it did not overlap in form or function with reactive relational aggression. Thus, future school-based research is clearly needed to continue to test the unique predictive role of the functions types of physical and relational aggression during early childhood.

The present study had several limitations that should be addressed in future research. First, in order to expand the study of relational aggression to younger ages, children as young as 30 months were included. Arguably, there are qualitative differences in the types of relationally aggressive behaviors that a 30-month-old and a 50-month-old would display. Future research is needed to investigate this possibility. Second, the sample (i.e., 116) resulted in somewhat diminished power for testing some of the effects when analyzing by gender (i.e., 62 girls and 54 boys). In addition, to maximize the sample size this study was not able to explore effects beyond 1 academic year; future research is needed with a longer time frame to explore the prospective associations between variables as well as the stability of aggressive behaviors across time and in particular as children make the transition from early childhood centers to kindergarten. Third, because family income data were collected from deidentified school reports, it is not possible to determine if the children of families living below the federal poverty level might have also been those that were learning English as a second language, which is a potential threat to the external validity of the sample. Fourth, the effect sizes in the present study, although in keeping with past studies with similar samples and studies with older children, were for the most part small in magnitude and must be replicated in future work. A fifth limitation concerns the

low level of aggressive behaviors observed across the study. In reviewing the descriptive statistics in Table 2, it is apparent that even when accounting for the converted nature of the means (i.e., multiply the means by the total number of sessions, or eight sessions in most situations), the means are often below 1.0. These findings of low base rates of aggressive subtypes are consistent with past observational work (see Leff & Lakin, 2005), similar to past studies using the current observational scheme (e.g., Ostrov & Keating, 2004; Ostrov, 2006) and in keeping with other school-based observational schemes for recording relational and physical aggression in early childhood (McEvoy et al., 2003; McNeilly-Choque et al., 1996). To avoid these methodological problems, future school-based observational studies should rely on multiple methods of assessment, including semistructured conflict stimulating observational tasks (e.g., Ostrov et al., 2004). In addition, there is the possibility of some outlier effects and caution should be exercised when interpreting the present findings. Additional research with clinical samples will be needed to determine the clinical significance and utility of the observational scheme. Sixth, the present study did not include an assessment of verbal aggression (i.e., mean names and verbal insults; cf. Ostrov & Keating, 2004) in order to reduce the number of analyses that were run and in turn control for Type I error. Verbal aggression has been found to be an important variable for predicting adjustment problems for both girls and boys in past research (e.g., Ostrov et al., 2004). In addition, the association between functions of relational and physical aggression and functions of verbal aggression are important issues for future research. Finally, a limited range of adjustment problems was included to reduce the number of analyses, and future studies should include more indices of psychopathology that are specifically relevant for functioning both within school settings (i.e., attention deficit hyperactivity disorder; Zalecki & Hinshaw, 2004) and in other contexts.

Implications for School Psychology Practice

School practitioners are well equipped to use the present observational scheme in their current assessment and evaluation of aggressive youth. The basic observational scheme used in the present study was designed for ease of use and has been positively evaluated by school psychology scholars for use in early childhood classroom and playground contexts (see Leff & Latkin, 2005). The observational methods described in the present study provide a level of analysis that short screening instruments and teacher report methods typically do not capture. For example, the present observational procedures account for the gender of the victim and the sequence of events (e.g., if relational aggression follows relational victimization), which are important criteria to target when generating intervention plans. Although basic training and time are involved in conducting observational assessments, they may be conducted with limited fiscal costs and low levels of reactivity; further, as part of a comprehensive evaluation, they may serve as valid indicators for the need for school-based peer intervention or as a reliable measure of intervention effectiveness in ongoing school-based prevention and intervention efforts. Finally, the present study underscores the need for school-based intervention programs during early childhood, which are specifically designed to address both proactive and reactive functions of physical and relational aggression.

The current findings advance the field in several ways. First, the present results suggest some utility for the distinction between school-based proactive and reactive aggression during early childhood. During early childhood these behaviors appear to be reliably detected, stable, only slightly correlated, and in some cases differentially predictive of adjustment problems. The current findings taken together provide additional confirmation of the importance of including assessments of both form and function (Little, Jones et al., 2003; Little, Brauner et al., 2003) across developmental periods. In general, this multim-

ethod, multiinformant school-based study suggests that proactive and reactive functions of relational and physical aggression subtypes may be harmful and potentially predictive of increased risk for future psychopathological symptoms for girls and boys during the early school years, which further indicates the need for empirically based preventative interventions for aggression across developmental periods (Leff, Power, Manz, Costigan, & Nabors, 2001).

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