



Deception and subtypes of aggression during early childhood

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Received 27 June 2005; revised 16 October 2005

Available online 2 December 2005

Abstract

A multi-informant study investigated the association between deception capacities and subtypes of aggression in a young early childhood sample ($M = 44.65$ months of age, $SD = 13.39$, $N = 64$). A newly developed teacher report of deception had appropriate psychometric properties (reliability, concurrent validity, and construct validity). Recently introduced observational methods of physical and relational aggression were reliable and valid with this sample. Findings indicated that both physical and relational aggression were associated with concurrent deception. For boys only, physical aggression uniquely predicted deception, controlling for the variance associated with relational aggression. In addition, relational aggression predicted deception above and beyond the role of physical aggression for the entire sample.

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Keywords: Deception; Aggression; Gender; Early childhood; Observation

Introduction

The study of aggression among peers now takes into consideration the externalizing problems of both boys and girls across development (Crick & Zahn-Waxler, 2003; Putallaz & Bierman, 2004). The study of relational aggression adds to our existing knowledge of aggression and allows us to avoid the myth that girls have benign childhoods and do not experience externalizing problems during early childhood (Zahn-Waxler, 1993). Two main

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subtypes of aggression, physical and relational, have now received attention by developmental psychologists and psychopathologists. Traditionally defined physical aggression involves the intent to hurt, harm, or injure others using physical force, including hitting, kicking, punching, pulling, pinching, and taking objects forcibly away from others. In most studies in the United States and abroad, physical aggression appears to be more frequent in boys from early childhood through adolescence (Coie & Dodge, 1998). The second subtype of aggression, relational aggression, has been defined as using either the removal or the threat of removal of the relationship as the vehicle of harm, including spreading malicious rumors, gossip, or secrets about peers and verbally or nonverbally ignoring or excluding peers during play (Crick et al., 1999). Relational aggression may be delivered in both direct and covert ways (Crick et al., 1999), distinguishing these behaviors from other conceptually related constructs such as indirect aggression (Bjorkqvist, 1994).

The study of relational aggression has recently broadened from a nearly exclusive emphasis on middle childhood and adolescence (e.g., Cillessen & Mayeux, 2004; Crick, 1996; Crick & Grotpeter, 1995; French, Jansen, & Pidada, 2002; Little, Jones, Henrich, & Hawley, 2003; Rose, Swenson, & Waller, 2004; Rys & Bear, 1997) to an increased focus on the early childhood period (e.g., Crick, Ostrov, Appleyard, Jansen, & Casas, 2004; Ostrov & Crick, 2005). In keeping with the gender-linked hypothesis of aggression (Crick & Grotpeter, 1995), to date the extant research indicates that relational aggression among peers appears to be more frequent among girls during early childhood based on multiple informants and assessment techniques (e.g., Bonica, Yershova, Arnold, Fisher, and Zeljo, 2003; Burr, Ostrov, Jansen, Cullerton-Sen, and Crick, 2005; Crick, Casas, and Mosher, 1997; Estrem, 2005; McNeilly-Choque, Hart, Robinson, Nelson, and Olsen, 1996; Nelson, Robinson, and Hart, 2005; Ostrov and Keating, 2004; Ostrov, Woods, Jansen, Casas, and Crick, 2004; Russell, Hart, Robinson, and Olsen, 2003; Sebanc, 2003; cf. Hart, Nelson, Robinson, Olsen, & McNeilly-Choque, 1998; Johnson & Foster, 2005). Researchers have documented that relational aggression during early childhood is associated with important close relationships (e.g., friends, siblings [Johnson and Foster, 2005; Stauffacher and DeHart, 2005]), language capacities (Bonica et al., 2003), and both peer rejection and controversial peer sociometric status (Crick et al., 1997; Nelson et al., 2005). In addition, relational aggression appears to be stable across an 18- to 24-month period during early childhood (Crick et al., 2005). Moreover, recent longitudinal findings suggest that middle childhood relational aggression may be predicted from early childhood family and individual risk factors such as temperament and parental negativity (Park et al., 2005). In addition, the evidence that relational aggression is associated, both concurrently and prospectively, with adjustment problems and symptoms of psychopathology (e.g., loneliness, depressed affect, lack of prosocial behavior) has been mounting (Crick et al., 1997, 2005; Ostrov et al., 2004; Zahn-Waxler, Park, Essex, Slattery, & Cole, 2005).

Deception during early childhood

Developmental scholars have been interested in the study of lying among children for many years (for a review, see Stouthamer-Loeber, 1986).¹ Researchers have used children's

¹ In the current study, we use the terms "lying" and "deception" interchangeably because we rely on the interpretation and definition provided by Wilson and colleagues (2003): "Lies are intentional communications that depend on knowledge of the beliefs of both the liar and the target of the deception" (p. 22).

responses to lies to understand the development of moral behavior from early childhood (range 5–11 years of age) to adulthood (range 18–57 years of age) (Peterson, Peterson, & Seeto, 1983). Cognitive developmental psychologists often have used young children's deception capabilities as an index of early theory of mind or perspective-taking abilities (e.g., Chandler, Fritz, & Hala, 1989). This research, which often relies on nonverbal skill or limited verbal capacity, has revealed that children as young as 2½ years of age are capable of using various deceptive behaviors in false belief tasks, suggesting a rudimentary theory of mind ability far younger than previously hypothesized (Chandler et al., 1989; cf. Peskin & Ardino, 2003). A recent observational study documented that lying and deception are common during early childhood, with some 4-year-olds lying roughly once every 2 h and some 2-year-olds lying roughly once every 5 h. The rate of lying appears to increase with development given that children significantly increase in their rate of lying from 2 to 4 years of age (Wilson, Smith, & Ross, 2003). The overall percentage of lies seems to remain the same from 4 to 6 years of age, with most children telling lies at least sometimes (Wilson et al., 2003). Researchers have also found that 3-year-olds are able to use facial and body gestures to deceive others in laboratory tasks (Lewis, Stanger, & Sullivan, 1989). In addition, gender differences have been obtained, indicating that girls admit lying less often than do boys and that girls use more verbal deception than do boys (Lewis et al., 1989). Finally, Bussey (1999) documented that 4-year-olds are able to distinguish between lying and truth telling but are not as sophisticated as children during middle childhood and early adolescence. That is, when evaluating vignettes for false statements or truths, 4-year-olds' classification of lies was in part dependent on the scenario. For these reasons, early childhood (i.e., 3–5 years of age) may be a particularly advantageous developmental period in which to investigate the association between deception and relational aggression.

Deception and aggression subtypes

Social and developmental psychologists have long studied the role of social manipulation and in particular how individuals disguise true intentions, gestures, and emotions in attempting to get resources (e.g., Buss, Gomes, Higgins, & Lauterbach, 1987). Researchers have documented that children who score high on both prosocial and coercive (i.e., aggressive) strategies, or who are sometimes referred to as "bistrategic" children (Hawley, 2003), also tend to be high on the ability to deceive others (Braginsky, 1970). Keating and Heltman (1994) found a link between children's social dominance and nonverbal deception capacities, but they did not assess aggressive behavior.

Developmental psychopathologists have documented the frequent cooccurrence of physical aggression, delinquent behavior, and lying (Lahey et al., 1999; Loeber & Dishion, 1983; Stouthamer-Loeber, 1986). Lying to obtain resources or avoid obligations and engaging in other covert behaviors (e.g., destruction of others' property) are often combined with bullying and physical aggression in DSM-IV (*Diagnostic and Statistical Manual of Mental Disorders*, 4th ed.) diagnoses of conduct problems (American Psychiatric Association, 1994). Despite the extensive past research linking physical aggression and lying, to date no known research has been conducted to explicitly test the association between deception or lying capacities and relational aggression. This lack of research is surprising given that several behaviors (e.g., spreading malicious lies, spreading secrets) presumably rely on these capacities. The current study is the first known test of this important empirical link.

The role of perspective-taking abilities and aggression has been debated in the past by theorists (Crick & Dodge, 1999; Sutton, Smith, & Swettenham, 1999). Some researchers have argued that perspective-taking abilities may underscore the display of physical aggression and social exclusion (Sutton et al., 1999). Other theorists have documented that, in keeping with the social information-processing model (Crick & Dodge, 1994), both perspective-taking abilities and empathy decrease physical and relational aggression (Crick & Dodge, 1999; Loudin, Loukas, & Robinson, 2003) and increase prosocial behavior (Eisenberg & Fabes, 1998). Because perspective-taking abilities often have been viewed as underscoring the use of deception (Chandler et al., 1989), the current study may help to elucidate the link between these social cognitive capacities and the use of intentional physical and relational acts of harm (i.e., aggression).

The study of relational aggression has been based nearly exclusively on the use of peer, parent, teacher, or self-report informants (for a review, see Crick et al., 2004). However, a few authors have developed observational systems for investigating relational aggression during early childhood among peers (McEvoy, Estrem, Rodriguez, & Olson, 2003; McNeilly-Choque et al., 1996; Ostrov & Keating, 2004; Ostrov et al., 2004) and siblings (Stauffer & DeHart, 2005). Despite some advantages to a scan-sampling approach using short time intervals (e.g., 5 s per session or 8 min total observation time per child [McNeilly-Choque et al., 1996]), the focal child approach using event sampling (e.g., Ostrov & Keating, 2004), in which one child is observed for an extended period of time (e.g., 10 min per session or 80 min total observation time per child), is valid and reliably captures both the direct and covert expressions of relational aggression among preschool and kindergarten children (Crick et al., 2004). These techniques also permit the evaluation of other relevant social behaviors (e.g., gender of play partners) in which these behaviors are naturally displayed. This method further allows the observer to take into account the full interaction between the children to rule out “rough-and-tumble” play (Pellegrini, 1989) and infer the intent of the aggressor. Despite the time, cost, and potential for observer biases, these ecologically valid methods have acceptable psychometric properties and are arguably more objective than other informants (Ostrov, Crick, & Keating, 2005). To this end, the current study relied on these novel observational methods to assess the aggressive behavior of the participants.

The current study had several empirical goals. We first determined the psychometric properties of our newly developed deception measure and attempted to replicate the reliability and validity of our aggression observations. In addition, for replication and descriptive purposes, we explored gender differences for both physical and relational aggression. In keeping with sexual selection theory (Pellegrini & Long, 2003) and past studies revealing the importance of the recipient’s gender, we predicted that girls would be more relationally aggressive to female peers than to boys and that focal boys would be more physically aggressive to male peers than to focal girls (Ostrov & Keating, 2004; Pellegrini, 2001).

The second main goal of the current study was to test the relation between physical and relational aggression subtypes and deception. Given past associations with deception and the conceptually related social dominance construct (Keating & Heltman, 1994) as well as with delinquency and physical aggression/conduct problems (Lahey et al., 1999; Loeber & Dishion, 1983; Stouthamer-Loeber, 1986), we predicted that both physical aggression and relational aggression would be associated with concurrent deception. Because both physical aggression and relational aggression have been found to have gender-specific

associations with key developmental constructs, we tested for the moderation of these associations by gender. In keeping with past studies (Crick & Bigbee, 1998; Rose et al., 2004), we tested for the unique role of physical and relational aggression in the prediction of deception. We predicted that each subtype would predict unique variance in deception when the other aggression subtype was controlled. To explore these goals, we conducted extensive naturalistic observations of young children's physical and relational aggression in the classroom and on the playground as well as obtaining teacher and research assistant reports of deception capacities.

Method

Participants

A total of 64 preschoolers (37 girls and 27 boys,² mean age = 44.65 months, $SD = 13.39$) were recruited from two nationally accredited and university-affiliated early childhood schools (three locations). Of these 64 children, 17 attended the first school and 47 attended the second school, which had two separate locations administered by the same director (33 children at Site 1 and 14 children at Site 2). Children were from relatively diverse ethnic backgrounds (11% African American, 20% Asian, 48% Caucasian, 5% Indian, 3% Latino, 2% Native American, 9% other ethnicities, 3% unknown). Parents provided written consent for all participants. Based on school demographics, children ranged from lower to upper middle class, with the majority being from highly educated, two-parent, middle-class families. Children attended the school for 27.42 h per week ($SD = 14.36$) on average. Teachers represented a range of academic backgrounds, with 28% possessing associate's degrees, 26% possessing bachelor's degrees, and 34% possessing master's or other advanced degrees (8% had other credentials, and 5% did not respond to the question). Each teacher had been serving as the focal child's teacher for 7.5 months ($SD = 5.5$) on average when completing the teacher report forms.

Measures

Observations of aggression

During training, observers spent considerable time in each participating classroom and on the playground to facilitate children's acclimation to their presence and reduced potential reactivity (Pellegrini, 2004). Observers always conducted observations within earshot of the focal child to hear and see the full peer interactions (Ostrov & Keating, 2004). When in the presence of the children, both in the classroom and on the playground, observers used a "minimally responsive manner" (Pellegrini, 2004) and were specifically trained in controlling their nonverbal behavior (e.g., facial expressions, posture, eye contact) to further diminish possible reactivity. Assessments of reactivity (e.g., frequency of looks, com-

² Because we collected in-depth observational data (total observation time = 5120 min or 85 h) and teacher reports on each child, we were not able to use a larger sample size. Despite our moderate sample size for an observational study of this type (McEvoy et al., 2003; Ostrov & Keating, 2004; Strayer & Roberts, 2004; Wilson et al., 2003), power analyses suggested that with an α of .05 we had sufficient power to test small to moderate-size effects when analyzing the data separately by gender.

ments, questions to the observer from the focal child) noted by observers when in the presence of children were low to nonexistent over the course of the study (<3% of the time, Atlas & Pepler, 1998). The order of children observed was determined randomly within each day of observation with certain caveats, namely that the number of observations stayed similar for all children and no child was observed more than once per day. This was designed to avoid interdependence in observations, to avoid observing a child multiple times on a particularly bad day, and to increase the range of play situations and context within which the children were observed. If children went out of range for more than 30 s, the observation was stopped and was restarted that day or completely redone on the next available day. Naturalistic observations were collected by 10 trained male and female advanced undergraduate students and 1 graduate student. The majority of observers rotated through different classrooms throughout the observation period. All observers were unaware of the goals and hypotheses of the study.

Assessment of aggression

Naturalistic observations of children's relational and physical aggression were conducted during free play using an adaptation of procedures developed by Ostrov and Keating (2004). Using a focal child approach, each child was observed for 10 min per assessment by a trained observer who was located in an unobtrusive position but within earshot. Over an 8-week period, each child was observed eight times for 80 min total observation time (Crick et al., 2005). We have found in past research that 80 min spread across several months provides an accurate portrayal of the focal child's aggressive behavior with peers. In fact, past research has revealed acceptable agreement between observers and teachers as well as the predictive validity of the observational measure (Crick et al., 2005; Ostrov & Keating, 2004), an advance over past observational methods that have used shorter amounts of observed time (e.g., McNeilly-Choque et al., 1996). Given that 80 min has provided a robust measure of children's behavior in the past, and given the difficulty and expense of this type of intensive data collection method, we were not able to collect additional assessments on each child, and that is a clear limitation of this study. As in prior research, the manner in which the observations were collected was not amendable to kappa coefficients because observers did not specifically record intervals when the aggressive behaviors of interest were absent. The use of intraclass correlations (ICCs) has been suggested in similar situations (McGraw & Wong, 1996) and has been used in past literature (e.g., Burr et al., 2005; Goldstein, Arnold, Rosenberg, Stowe, & Ortiz, 2001; NICHD Early Child Care Research Network, 2004; Ostrov & Keating, 2004; Ostrov et al., 2004; Stauffacher & DeHart, 2005). Evidence for favorable interrater reliability of this observational measure has been demonstrated in past research (e.g., ICCs of .75 for physical aggression and .82 for relational aggression [Ostrov and Keating, 2004]). This observational method has demonstrated acceptable validity in the past, with moderate correlations (r) between teachers and observers ranging from .42 to .50 for relational aggression and from .47 to .62 for physical aggression (Crick et al., 2005; Ostrov & Keating, 2004).

In the current investigation, training consisted of several readings, discussions with the trainer, and coding of videotapes of children's aggressive and prosocial behavior from past studies (Ostrov & Keating, 2004; Ostrov et al., 2004). Observers were required to reach an acceptable level of interrater reliability with the videotapes (>.80), pass a short written

multiple-choice/matching examination (with discussion for any incorrect answers), and conduct several live practice reliability observations in the classroom and on the playground with the trainer (with discussion for any errors). Assessments of reliability were conducted throughout the study to avoid observer drift problems (Pellegrini, 2004).

During each 10-min assessment interval, the observer recorded the focal child's engagement in the following, including a full description of what occurred and the genders of all children involved: (a) physical aggression (e.g., hitting, shoving, pulling, taking objects), (b) relational aggression (e.g., excluding from an activity, using friendship withdrawal as a threat, giving the "silent treatment," covering ears to signal ignoring, spreading malicious rumors, spreading secrets). Separate behaviors were recorded based on temporal breaks in the interactions during the observation. Additional behaviors (e.g., play and pro-social behaviors, victimization) were collected for the purposes of a different study. Each child was observed on eight separate occasions, and behaviors noted during observations were summed to yield total behavior scores for each time period. The average number of instances of relational aggression and physical aggression per 10-min session was calculated for each child. Interrater reliability was assessed at each time point on 15% of observations spread across the 8-week observation period. Reliability was acceptable for relational aggression ($ICC = .81$) and physical aggression ($ICC = .95$).

Teacher report of deception

The Children's False Statement–Teacher Form (CFS-TF), a new measure of deception, lying, and false statements, was generated for this study. This measure was adapted from Wilson and colleagues (2003), who developed a reliable home-based observation system of deception and false statements during early childhood. Based on the coding categories from the past observational measure, seven items were generated for a teacher report instrument (Table 1). Teachers responded using a 5-point scale ranging from 1 (*never or almost never true*) to 5 (*always or almost always true*), indicating the degree to which each of the statements applied to the focal child. Three positively toned filler items were included to avoid negative response bias (e.g., "This child is fair and honest when playing with others"). The seven-item measure had appropriate internal consistency reliability (Cronbach's $\alpha = .91$).

To establish the concurrent validity of the CFS-TF, because only one head teacher was available to complete the teacher ratings for each child, one research assistant (RA) familiar with the focal child completed the CFS-TF after all observations had been completed.

Table 1
Factor loadings of children's false statement measure on one principal factor

Item	Deception factor loading
1. This child makes false statements to make her/himself look good	.82
3. S/he uses deception to manipulate her/his peers during play.	.47
4. I have noticed this child falsely accuses others of inappropriate behavior.	.88
5. S/he avoids responsibility for her/his actions by making false statements.	.81
6. To obtain another's compliance, s/he uses false statements.	.75
8. To gain control of a toy or resource, this child uses false statements.	.96
9. This child deceives others to get what s/he wants.	.69

Note. Items 2, 7, and 10 were positively toned filler items. The full measure is available on request.

The RAs had several months of exposure to the children via training and observational data collection sessions. The Cronbach's α for the RA report of the CFS-TF was .92.

Teacher report of aggression

The Preschool Social Behavior Scale–Teacher Form (PSBS-TF) developed in prior studies was used to assess teacher perceptions of children's physical and relational aggression (Crick et al., 1997). This instrument consists of 16 items, 6 of which assess relational aggression (e.g., “This child tries to get others to dislike a peer,” “This child tells a peer they won't be invited to their birthday party unless s/he does what the child wants”), 6 of which assess physical aggression (e.g., “This child kicks or hits others”), and 4 of which assess prosocial behavior (e.g., “This child is helpful to peers”). The prosocial items were included in this instrument for ethical and methodological reasons (i.e., to avoid negative response sets) and served as positively toned filler items in the current study. Additional items were collected for purposes of a different study. Teachers rated the degree to which children exhibited relational and physical aggression directed at their peers using a 5-point scale ranging from 1 (*never or almost never true*) to 5 (*always or almost always true*).

Evidence supports the favorable psychometric properties of the PSBS-TF (e.g., Bonica et al., 2003; Crick et al., 1997; Estrem, 2005; Hart et al., 1998; Johnson & Foster, 2005; Ostrov & Keating, 2004; Park et al., 2005). Specifically, teachers' responses to this measure have been shown to be reliable, with Cronbach's α s exceeding .90 for both the relational aggression and physical aggression scales. Also, factor analyses have confirmed the existence of distinct factors for relational and physical forms of aggression in several preschool samples. Similarly, in the current investigation, assessments of teacher-reported physical and relational aggression were reliable (Cronbach's α s > .80).

Procedure

Observations (total of 5120 min or 85 h) were conducted during the fall and were initiated approximately 2 months after the children had begun attending school for that year, allowing time for the children to get to know one another (Ostrov & Keating, 2004). Teacher reports were distributed when approximately half of the observation sessions were completed. RA forms were completed after all observations were finished. Teachers received an honorarium (\$25 gift certificate) for their participation. All families and staff members received a newsletter summarizing the major findings of the study.

Results

To address the goals of the study, a series of analyses were run. First, to evaluate the construct validity of the new teacher report measure, a principal components analysis was run. Second, to replicate the validity of the observations of aggression, teacher reports and observations were correlated. In addition, the intercorrelation between physical aggression and relational aggression was tested. Third, analyses of variance (ANOVAs) were run to explore gender differences for aggressive behavior. Fourth, a series of hierarchical regression analyses were conducted to test the link among gender, relational aggression, and physical aggression, with deception serving as the outcome variable. In the next model, we examined whether physical aggression accounted for unique variance in decep-

tion, controlling for relational aggression. A final model was conducted exploring whether relational aggression predicted unique variance in deception, accounting for the variance associated with physical aggression.

Construct and concurrent validity of teacher report of deception

To establish the construct validity and to explore the internal structure of the CFS-TF, an item-level principal components analysis with varimax rotation was conducted. The scree plot suggested that a one- or two-component solution might be viable (eigenvalues for the components were 4.61, 1.35, 0.52, 0.21, 0.15, 0.09, and 0.07). Despite the possibility of a second component (e.g., consisting of items 3, 6, and 9), only one component was extracted with moderate to high loadings (i.e., $>.55$) on the one component. A second test was conducted using principal axis factoring and both varimax rotation and promax rotation (in separate models). The factor solution (for factor loadings, see Table 1) was consistent with one factor, and all factor loadings were moderate to high (i.e., $>.47$). In addition, the correlation between the two potential factors was moderate and significant, $r = .54$, $p < .001$. Therefore, given the theorized superordinate construct of deception that applies to both potential factors (Wilson et al., 2003), only one factor was selected for the current study. In addition, to test the concurrent validity of the teacher reports, correlations were run between the teacher and RA reports for the CFS-TF. The correlation between the teacher-reported CFS-TF and the RA-reported CFS-TF was significant, $r = .41$, $p < .01$.

Concurrent validity of the observations

To further establish the validity of the observational methods used in the current study, correlations were conducted between the PSBS-TF and the observations for each subtype of aggression. For physical aggression, teachers and observers significantly agreed, $r = .45$, $p < .001$. For relational aggression, teachers and observers also significantly agreed, $r = .40$, $p < .01$. These findings replicate those of past studies that verified the validity of the observations of physical and relational aggression (Crick et al., 2005; Ostrov & Keating, 2004). In addition, as an indicator of the uniqueness of these constructs (Crick et al., 2005), the intercorrelation between observed physical aggression and observed relational aggression in the current sample was not significant, $r = .21$ ns.

Gender differences in aggression

For replication and descriptive purposes, gender differences for observed aggression were conducted with one-way ANOVAs at the level of the target child or recipient's gender. The findings largely confirm past findings using these methods (Crick et al., 2005; Ostrov et al., 2005; Ostrov & Keating, 2004) and demonstrate the importance of exploring gender differences at the level of the target child or recipient's gender. That is, girls were more relationally aggressive to female peers than were boys, $F(1,61) = 6.83$, $p < .01$, $\eta^2 = .10$, and boys were more relationally aggressive to male peers than were girls, $F(1,61) = 7.50$, $p < .01$, $\eta^2 = .11$. In addition, boys were more physically aggressive to male peers than were girls, $F(1,61) = 19.90$, $p < .001$, $\eta^2 = .25$. There were no differences

Table 2
Descriptive statistics for aggression subtypes and deception measures

Variable	Focal boys			Focal girls		
	Mean	SD	Range	Mean	SD	Range
Relational aggression to male	.12	.18	0–5	.03	.05	0–1
Relational aggression to female	.02	.04	0–1	.12	.20	0–7
Physical aggression to male	.28	.27	0–8	.05	.12	0–3
Physical aggression to female	.10	.09	0–2	.11	.13	0–4
Deception (teacher report)	11.74	4.32	7–22	9.65	3.05	7–17
Deception (RA report)	12.67	2.89	11–16	10.25	1.39	7–11

Note. The average number of instances of relational aggression and physical aggression per 10-min session (i.e., eight total sessions) was calculated for each child, and those means are displayed in the table for the means and standard deviations. The original scores (i.e., not converted) were used for the ranges to facilitate meaningful interpretations.

between boys and girls for physical aggression to females, $F(1, 61) = 0.20$ (for descriptive statistics, see Table 2).³

Association between aggression subtypes and deception

Preliminary bivariate correlations revealed that deception was associated with concurrent physical aggression, $r = .36$, $p < .01$, and with relational aggression, $r = .31$, $p < .01$. Analyses were first conducted to test whether concurrent relations between each subtype of aggression and deception should be conducted for the entire sample or separately by gender (Rose et al., 2004). Physical aggression and gender were entered at Step 1, and their interaction was entered at Step 2. The interaction was significant ($\beta = -.78$, $p < .05$);⁴ physical aggression ($\beta = .49$, $p < .01$) predicted deception only for boys, $F(1, 23) = 7.36$, $p < .01$, $R^2 = .24$, and not for girls ($\beta = .03$). Thus, subsequent analyses with physical aggression were conducted separately for girls and boys.

To examine whether gender moderated the association between relational aggression and deception, in a separate model, relational aggression and gender were entered at Step 1 and their interaction was entered at Step 2. Relational aggression ($\beta = .32$, $p < .01$) but not gender ($\beta = -.19$) was a significant predictor of deception, $F(2, 58) = 4.52$, $p < .05$, $R^2 = .18$. The interaction between gender and relational aggression was found to be non-significant ($\beta = -.73$) in the prediction of deception; thus, the entire sample was used in subsequent analyses.

³ Because aggressive behavior may be partly determined by the gender of male and female peers with whom preschool children interact, we statistically controlled for the number of male and female peers that each child interacted with during observations; that is, each time a child interacted with a new peer in the classroom, we gave him or her 1 point and then summed across all eight sessions to generate these variables. These play partner variables have been found to be reliable in the past (Ostrov & Keating, 2004) as well as in the current study (ICCs > .85). A series of analyses of covariance (ANCOVAs) were run, controlling for the number of male and female playmates (Ostrov & Keating, 2004). The findings that emerged were virtually identical to the presented findings and so are not reported in the text.

⁴ All β s are standardized regression weights.

Unique role of physical aggression in predicting deception

To test the unique role of physical aggression in predicting deception, observed relational aggression were entered at Step 1. Observed physical aggression was entered at Step 2. Given the prior interaction that was found for physical aggression and gender, we conducted these analyses separately for girls and boys. For boys only, physical aggression ($\beta = .39, p < .05, R^2 = .34$) was a significant predictor of deception, controlling for the variance associated with relational aggression, $\Delta F(1, 22) = 4.74, p < .05, \Delta R^2 = .14$. In keeping with the initial analyses, for girls only, physical aggression ($\beta = -.003$) did not predict deception above and beyond relational aggression, $\Delta F(1, 33) < 1$.

Unique role of relational aggression in predicting deception

To test the unique role of relational aggression in predicting deception, gender and observed physical aggression were entered at Step 1. Observed relational aggression was entered at Step 2. Relational aggression ($\beta = .26, p < .05, R^2 = .19$) significantly predicted deception above and beyond the role of physical aggression and gender, $\Delta F(1, 57) = 4.47, p < .05, \Delta R^2 = .06$.

Discussion

In the current study, we tested the link between deception capacities and two subtypes of aggression during early childhood. The newly developed teacher report of deception (CFS-TF) was found to correspond with an independent rating by RAs who were familiar with the focal children but unaware of the hypotheses of the study. In addition to being internally consistent, the principal components analysis indicated that the deception measure was composed of essentially one main factor, demonstrating construct validity. Collectively, these analyses provide justification for the use of this measure during early childhood. However, because of our diminished power for testing some effects, future researchers should continue to test the properties of this measure with a larger and more diverse sample. This study is the fourth independent sample to demonstrate the reliability and validity of the observational methods developed by [Ostrov and Keating \(2004\)](#) (see also [Crick et al., 2005](#); [Ostrov et al., 2004](#)). The focal child approach offers promise for investigating both aggression and associated social behaviors (e.g., play partners, play styles) in several naturalistic settings (e.g., classroom, playground). The main findings from this study also demonstrate the unique role that observed physical and relational aggression has during early childhood.

The findings from this study are in keeping with past theory and results found within the social dominance and delinquency/conduct problems literatures (e.g., [Keating & Heltman, 1994](#); [Stouthamer-Loeber, 1986](#)). The current research confirms past studies that have found deception, lying, and false statement behaviors in young children. In addition, we have documented that both girls and boys engage in these behaviors according to their head teachers and to RAs who spent considerable time observing the focal children. By the time children are 3 to 4 years of age, they apparently are able to use deception or false statements to manipulate others, gain control of toys, or avoid responsibility for misdeeds, confirming and extending past developmental research ([Wilson et al., 2003](#)). In addition,

this study is the first to demonstrate that these abilities are associated with both physical aggression and relational aggression. A child might lie after hitting a peer or sibling to avoid punishment by a teacher or parent. In addition, past studies have demonstrated that children as young as 3 years of age are able to use sophisticated relationally aggressive behaviors such as spreading malicious rumors or secrets (Ostrov et al., 2004). It is possible that deception capacities and language skill (Bonica et al., 2003) facilitate the display of more sophisticated relationally aggressive behaviors. In addition, it is important to reveal that, as predicted, findings showed that both physical aggression and relational aggression were uniquely associated with concurrent deception abilities. That is, these behaviors may serve different purposes for physical aggression and relational aggression. Future research is needed to explore under what specific social and play contexts children use deception and false statements with their peers. In addition, it is important to note that deception abilities might not always be malicious or used for personal gain (e.g., the use of “white lies” [Wilson et al., 2003]), and future research is needed to further qualify the nature and quality of these behaviors.

Future longitudinal research is also needed to test the direction of effect between aggression subtypes and deception abilities. That is, do deception abilities promote the use of relationally aggressive behaviors, or do children who are relationally aggressive in a direct way (e.g., “You can’t come to my birthday party”) learn deceptive relationally aggressive tactics (e.g., spreading malicious rumors or lies about others)? Research is needed to focus on how young children acquire sophisticated deception-oriented, relationally aggressive tactics. Do older siblings and peers model these behaviors? Past research indicates the importance of these relationships (Burr et al., 2005; Stauffacher & DeHart, 2005), but a more in-depth analysis is needed to tease apart these influences over time. Additional play contexts and other social cognitive capacities (e.g., role of language and memory) and attributions (Crick & Dodge, 1994) should be included in future studies. Finally, studies should explore the link between deception and aggression in younger ages. The current evidence indicates that some children as young as 30 months of age are engaged in rudimentary relationally aggressive behaviors (Crick et al., 2005), and it will be crucial for future studies to assess for deception during this period as well.

In conclusion, the current research adds to the literature in several ways. This study introduced a new reliable and valid measure for assessing teacher reports of deceptive ability. These measures could be used in future studies to complement existing observational instruments (Wilson et al., 2003) so as to avoid shared method variance problems when assessing the relation between deception and other observed social behaviors. The use of recently introduced observational methods of aggression subtypes was further supported in this independent and young sample. This study is the first to demonstrate that both physical aggression and relational aggression uniquely predict deception in children as young as 3 years of age. Early childhood educators and researchers should continue to bridge the social and cognitive developmental literature by exploring the developmental significance of deception abilities as well as physical and relational aggression for girls and boys.

Acknowledgments

The contributions of Kirstin Stauffacher and the entire UB Early Childhood PLAY Project staff are greatly appreciated. I thank the families, teachers, and directors of partic-

ipating schools. I acknowledge Leonard Simms for consultation concerning factor-analytic techniques.

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