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Relational Aggression in Middle Childhood: Predictors and Adolescent Outcomes

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Abstract

This study examined gender differences in the level and developmental course of relational aggression in middle childhood, as well as early predictors and outcomes of relational aggression, after controlling for concurrent physical aggression. Relational (RAgg) and Physical aggression (PAgg) scores for 558 boys and 545 girls at ages 8–11 in the NICHD Study of Early Child Care and Youth Development (SECCYD) were created by combining the highest rating for each item across mother and teacher reports. Longitudinal analyses were conducted using Latent Curve Models of RAgg with PAgg as a time-varying covariate, with all parameters allowed to vary by gender. Boys and girls had different growth parameters of RAgg. Girls' RAgg intercept was higher and the slope was not different from zero; boys' RAgg intercept was lower and the slope declined. Mother-child conflict in early childhood predicted RAgg intercept for both boys and girls, but maternal harsh control and sensitivity were also uniquely predictive for girls, whereas center care was uniquely predictive for boys. RAgg intercept predicted adolescent self-reports of depression for girls and delinquency and risk-taking for both boys and girls; the magnitude of the association with risk-taking was significantly greater for boys.

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Keywords

adolescence; aggression; child care; middle childhood; mother-child relations

There has been increasing interest in the developmental course, correlates, and outcomes of gender differences in aggression. Recently, Ostrov and Godleski (2010) proposed an integrative model for understanding the development of two forms of aggression, physical and relational, in early and middle childhood. They assert that despite the lack of robust gender differences in relational aggression (Archer, 2004; Card, Sutcky, Sawalani, & Little, 2008), a gender-linked theory of aggression subtypes contributes to a general model of aggression because the causes and correlates of these different types of aggression may vary by gender. In this prospective, longitudinal study, we model the growth of relational aggression over four years in late middle childhood, controlling for physical aggression, and consider early childhood predictors and adolescent outcomes of middle childhood growth parameters of relational aggression in girls and boys, testing some of the postulates of Ostrov and Godleski (2010).

Gender Differences in Physical and Relational Aggression

Physical aggression is part of a construct of overt, direct aggression that includes both verbal and physical acts (Little, Jones, Henrich, & Hawley, 2003). Physical and overt aggression, particularly among boys, has received the most research attention. Boys generally evidence more physical aggression than girls even as toddlers, but most children show decreasing physical aggression by age 2 or 3 (NICHD Early Child Care Research Network [ECCRN], 2004a; Tremblay et al., 1999). Elevated and persistent physical aggression is predicted by more sociodemographic risk, lower levels of maternal warmth and sensitivity, and higher maternal depressive symptoms (NICHD ECCRN, 2004a); its sequelae include higher rates of school and peer problems (Campbell, Spieker, Burchinal, Poe, & NICHD ECCRN, 2006; NICHD ECCRN, 2004a), and delinquent behavior in adolescence (Broidy et al., 2003; Campbell, Spieker, Vandergrift, Belsky, Burchinal, & the NICHD ECCRN, 2010).

Less is known about the developmental course of relational aggression, defined as “behaviors that harm others through damage (or the threat of damage) to relationships or feelings of acceptance, friendship, or group inclusion” (Crick et al., 1999, p. 77). Relational aggression shares core features with the constructs of indirect aggression (Bjorkqvist, Lagerspetz, & Kaukiainen, 1992) and social aggression (Galen & Underwood, 1997). Although some kinds of relational aggression, such as threatening to exclude a peer from the group, are both social and direct, relational, indirect, and social aggression were treated as essentially the same construct—labeled indirect aggression (social, relational, and covert acts involving the hurtful manipulation of relationships)—in recent meta-analyses (Archer, 2004; Card et al., 2008) and a discussion of the dimensional structure of the forms and functions of aggression (Little et al., 2003). Like physical aggression, relational aggression can function in two ways. It can be reactive or defensive, as in excluding a peer one is angry with from the group, or proactive, offensive or instrumental, as in coolly spreading rumors to damage another’s social standing to enhance one’s own. In all cases there are actual or potential relationship consequences to the victim.

Researchers differ on the extent to which they assert that relational aggression is particularly utilized by females. Underwood (2003) suggests that gender differences found by chance have made their way into the literature, exaggerating their prevalence. In contrast, Crick et al. (1999) have argued that girls are more upset than boys by relationship difficulties, and that the relational aggression that arises from these difficulties is both more common and

more normative in girls. However, in contrast to the relatively large gender differences favoring males in the amount of physical aggression found at all ages across all reporters (Tremblay et al., 1999), gender differences in relational aggression have been consistently smaller in magnitude (Archer, 2004; Card et al., 2008). Nevertheless, the prevailing view is that females are more relationally aggressive and, when both physical and relational forms are taken into account, boys and girls are equally aggressive (Crick & Grotpeter, 1995; Crick et al., 1999).

The gender-linked theory of Ostrov and Godleski (2010) predicts that during middle childhood, a time when gender-segregated peer groups are the norm, girls should display more relational aggression than boys, boys more physical aggression than girls, and aggressive behavior that is not gender-normative should decrease: “as gender identity becomes more constant..., modifications in response decision processes and behavioral enactments of alternative subtypes of aggression should follow (i.e., gender non-normative aggressive behavioral responses and enactment should be decreased).” (Ostrov & Godleski, 2010, p 239). However, in a recent meta-analysis, Card et al. (2008) found only trivial sex differences in indirect aggression, favoring girls, and age did not moderate this association, a finding inconsistent with the notion that there are gender normative types of aggression, although the studies reviewed were mostly cross sectional. The present study enables us to test both gender differences in aggression type and gender differences in developmental change in a large, prospective, longitudinal sample.

Correlates and Predictors of Relational Aggression

The question of gender differences in the frequency of relational aggression is arguably less important than the origins of this behavior in males *and* females, and its correlates in social and emotional adjustment. Crapanzano, Frick, and Terranova (2010) found that although both boys and girls in the fourth through seventh grades were relationally aggressive, only girls were characterized by distinct profiles of relational aggression (none, reactive aggression only, and combined reactive/proactive) that were similar to the profiles of physical aggression exhibited by both individual boys and girls. Crapanzano et al. hypothesize that the causes of relational aggression in girls may be the same as causes of physical aggression in both boys and girls, whereas the causes of boys' relational aggression may differ. Research to date has been inconsistent but it has been noted that direct and indirect forms of aggression are related but distinct, sharing about half (57%) their variance (Card et al., 2008), suggesting that examinations of either form of aggression should control for the other to determine unique antecedents.

Family characteristics

Concurrent studies of predictors of relational aggression that consider or control for physical aggression have been rare. Casas et al. (2006) reported that maternal psychological control was positively associated with preschool-age boys' and girls' relational aggression. Curtner-Smith et al. (2006) reported similar concurrent relations of low maternal empathy and a controlling parenting style with higher levels of both relational and physical aggression for preschool-age boys and girls; maternal negative affect also has been associated concurrently with relational aggression in children ages 5–8 (Brown, Arnold, Dobs, & Doctoroff, 2007). In contrast, some researchers have reported that maternal authoritarian parenting (Casas et al., 2006) and maternal coercion (Hart, Nelson, Robinson, Olsen, & McNeilly-Choque, 1998) are associated with more relational aggression for girls only. Finally, Herrenkohl et al. (2007) found that family conflict was associated with both physical and relational aggression in adolescents, and Park et al. (2005) reported that maternal negativity in the preschool years was related to both relational and overt aggression in middle childhood.

Although the evidence reviewed above is mixed, some have suggested that the associations between negativity in the family and relational aggression in the offspring should be stronger for girls than for boys. Zahn-Waxler, Park, Essex, Slattery, and Cole (2005) speculated that because girls have a strong interpersonal relationship orientation and greater receptivity to negative emotions in the family, girls' rejection within the family "may become a breeding ground for relational aggression" (p. 276).

In summary, the literature reports similar family process predictors of both physical and relational aggression when assessed in early childhood, and some evidence also suggests that demographic risks like low income are mediated through adverse parenting. Although some have hypothesized that the predictors should vary by child gender (e.g., Crapanzano et al, 2010), the evidence is inconsistent. Not all studies consider both physical and relational aggression together in the same model, and most studies are concurrent, not longitudinal. In this report, we address this gap in the literature by examining early demographic and family process variables as unique predictors of relational aggression in middle childhood, while controlling for physical aggression, and allowing predictors to vary by gender.

Child care

Early child care experiences also have been linked to both boys' and girls' subsequent aggression. In the NICHD Study of Early Child Care and Youth Development (SECCYD) consistent associations have been reported between experiences in early child care and children's overt aggression from the preschool years through middle childhood. More time in any type of child care from 6–54 months of age was associated with aggressive behavior reported by caregivers at 54 months and teachers at kindergarten (NICHD ECCRN, 2003). More time in center-based care during this same period was similarly associated with externalizing problems and conflict with adults (NICHD ECCRN, 2003, 2004b). Later analyses found that more exposure to center care during infancy and preschool, but not overall time in any care, predicted more teacher-reported externalizing problems in Grade 6 (Belsky et al., 2007). Finally, more time in any type of child care through 54 months predicted self-reports of impulsivity and risk-taking at age 15, and child care quality predicted fewer self-reported externalizing problems (Vandell et al., 2010). To our knowledge, researchers have not yet examined child care experience in the first years of life as a predictor of relational aggression in middle childhood. Since play groups in early childhood are largely gender segregated (Maccoby & Jacklin, 1987), we would expect that more time in child care would be associated with more relational aggression in girls and more physical aggression in boys (Ostrov & Godleski, 2010). This is because the increased amount of time spent with peers and the strategies learned in the peer group would continue to be utilized within gender-segregated peer groups later in development. Therefore, we include potential child care predictors of relational aggression that were previously associated with physical aggression and later maladjustment in childhood and adolescence.

Relational Aggression and Adjustment

Ostrov and Godleski (2010) predict that "for girls, relational aggression should be more developmentally salient and thus more likely to predict indicators of social-psychological adjustment across time (p 240)." This study addresses this hypothesis and also asks whether there are differential consequences of elevated relational aggression in late middle childhood for boys' and girls' adjustment in adolescence.

Findings provide some support for the idea that high relational aggression in boys, a 'non-normative' type of aggression for them, has more adverse consequences than 'normative' relational aggression in girls (Crick, 1997), and that relational aggression which is normative for girls has few negative consequences for girls once the effects of physical aggression are

controlled (Putallaz et al., 2007). On the other hand, studies also report that relational aggression, controlling for the effects of physical aggression, predicts maladjustment for girls but not boys (Crick & Grotpeter, 1995). The meta-analysis by Card et al. (2008) summarized what is known about specific concurrent associations between direct and indirect aggression with internalizing and externalizing problems. Only indirect aggression had a unique and differential association with internalizing problems. Both direct and indirect aggression were uniquely associated with delinquency and age and gender did not moderate these associations. These findings, contrary to the model suggested by Ostrov and Godleski (2010), suggest that when both direct and indirect aggression are examined as predictors of later adjustment, direct aggression carries the most weight, with minimal evidence for age or gender differences. This research, however, mostly examined concurrent relations with adjustment and not longitudinal associations.

Research Questions

We focus on early demographic, family process, and child care predictors of relational aggression across late middle childhood and outcomes of relational aggression in adolescence, controlling for physical aggression across the same ages, using the large, longitudinal sample of the NICHD SECCYD. The SECCYD had yearly assessments of relational aggression in Grades 3 through 6, a time period of gender-segregated peer groups for which some have hypothesized a peak in relational aggression, especially for girls (Murray-Close et al., 2007). We examine relational aggression growth parameters, level and change over time, and test whether the data fit a one group (no sex differences in growth parameters) or two group (gender differences in growth parameters) model best. Based on the integrative theory proposed by Ostrov and Godleski (2010) we predicted that girls would show more relational aggression than boys, and boys but not girls would decrease their relational aggression during this time period.

A limited set of child and family risk factors was selected for the current study based on the literature on predictors of physical or relational aggression. In earlier work with the SECCYD sample, demographic risk (low income, low maternal education, and ethnic minority status), maternal depression, and maternal insensitivity predicted the individual intercept and slope of mothers' reports of child physical aggression from 24 months through Grade 3 (NICHD ECCRN, 2004a). These variables, composited where applicable across the first 54 months, were selected to be tested as unique predictors of relational aggression. Some studies in the relational aggression literature implicate maternal harsh control and child-parent conflict as precursors or correlates of relational aggression or of both relational and physical aggression (Brown et al., 2007; Herrenkohl et al., 2007; Park et al., 2005; Zahn-Waxler et al., 2005). We selected maternal reports of harsh control toward the child and of conflict with the child in the preschool years as additional predictors.

Finally, two features of child care were selected: amount of time spent in nonmaternal care 3–54 months, and the proportion of that time spent in center care, because of their consistent associations with physical aggression and externalizing problems in the SECCYD, and because of the possibility that child care experience could incubate relational aggression in girls, due to peer group socialization (Ostrov & Godleski, 2010). All predictors were allowed to vary by gender in the models.

Most studies examine concurrent correlates of relational aggression. In contrast, we examine children's self-reports of adjustment difficulties at age 15, several years and a developmental shift into puberty after the measurement of relational aggression. Based on Ostrov and Godleski (2010) we predict that girls will show more associations between relational

aggression in late middle childhood and social-psychological maladjustment in adolescence. The research questions were as follows:

1. Is the developmental trajectory of relational aggression from grades 3 to 6, controlling for physical aggression, the same for boys and girls? We predicted a higher intercept for girls and a decreasing slope for boys.
2. What are the early childhood demographic, family process and child care predictors of relational aggression across late middle childhood, and are they the same for boys and girls? We predicted more associations with family process and child care variables for girls because of the assertion that they are more upset than boys by relationship difficulties.
3. What are the mid-adolescent adjustment outcomes for relational aggression in late middle childhood, and are they the same for boys and girls? We predicted that relational aggression would be associated with more maladjustment in girls because of the greater salience of relational aggression for girls.

Method

Participants

Participants ($N = 558$ boys, 545 girls) were recruited in 1991 to participate in the NICHD SECCYD, a prospective longitudinal study. When study children were 1 month old, 1,364 families at 10 research sites completed a home visit and were enrolled in the study. The recruited sample consisted of 52% boys, 24% children of color, 11% mothers who did not complete high school, and 14% single-parent families. Details about the sample and subject recruitment are described in NICHD ECCRN (2005) and measures can be found at the study web site (<http://secc.rti.org/>).

The analysis sample for this report includes 1,103 children for whom we have preschool predictor data, at least one middle childhood measure of aggression, and age 15 adolescent outcome data. The analysis sample differed from the 261 children who were in the recruitment sample but did not complete the school-age assessments. Mothers in the analysis sample had more education at 1 month ($M = 14.4$ years vs. 13.5 years), $F(1, 1361) = 30.12$, $p < .001$; children in the analysis sample, compared to other children in the recruitment sample, were more likely to be non-Hispanic White (82% vs. 76%), $\chi^2(1, N = 1364) = 4.40$, $p < .05$.

Measures of Child Aggression

Relational aggression—Each year when children were in Grades 3–6 (approximately ages 8–11) mothers and teachers completed six items measuring relational aggression from the Children's Social Behavior Scale (Crick, 1996), rated on a 3-point scale (0–2). Sample items are “When mad at a peer, gets even by excluding the peer from the group; Spreads rumors or gossips about some peers.” Half of the items reflected reactive aggression, as in the first example, and half possible proactive or instrumental aggression, as in the second. The relational aggression score is computed as the sum of the six item scores. Research has demonstrated that composited reports from multiple informants in different settings are better predictors of children's adjustment than are single-informant reports (Ladd & Kochenderfer-Ladd, 2002). Therefore, we used both mother and teacher reports to compute a single relational aggression score in each of Grades 3–6. For each annual score, we retained the highest score for each item across the two informants and computed a summed aggression score ($\alpha = .82-.83$).

Physical aggression—At each assessment in Grades 3–6, mothers completed the Child Behavior Checklist (CBCL; Achenbach, 1991a) and teachers completed the Teacher Report Form (TRF; Achenbach, 1991b). Items are rated on a 3-point scale (0–2). We selected six items reflecting overt physical aggression that appear on both the CBCL and the TRF (e.g., “gets in many fights”). We used a similar set of items in our earlier work examining trajectories of physical aggression (NICHD ECCRN, 2004a). Similar to our computation of relational aggression scores, we computed a single physical aggression score annually from the mother and teacher reports, retaining each item’s highest score across the two informants and summing item scores ($\alpha = .79-.82$).

Measures of Early Predictors of Child Relational Aggression

Demographic characteristics—Mothers were interviewed about family characteristics at regular intervals from birth through 4.5 years (1, 6, 15, 24, 36, and 54 months). At 1 month, mothers reported their own *education* (in years) and the child’s *race and ethnicity*. Family income data from 6 months through 54 months were used to create an *income-to-needs ratio* calculated from U. S. Census Bureau tables as the ratio of family income to the poverty threshold for each household size. The ratios were averaged to create a cumulative income-to-needs score.

Maternal depression—At 6, 15, 24, 36, and 54 months, mothers completed the 20-item Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). Items are rated on a 4-point scale to tap frequency of depressive symptoms and summed to form a total score ($\alpha = .89-.91$). Scores were averaged over the five time periods.

Maternal sensitivity—Trained coders rated maternal caregiving from videotaped, 15-min mother-child interactions at 6, 15, 24, 36, and 54 months during semi-structured play. At 6, 15, and 24 months, composite maternal sensitivity scores were computed as the sums of 4-point ratings of three maternal behaviors: sensitivity to nondistress, positive regard for child, and reflected intrusiveness ($\alpha = .70-.75$). At 36 and 54 months, composite maternal sensitivity was the sum of 7-point ratings of supportive presence, respect for the child’s autonomy, and reflected hostility ($\alpha = .78-.84$). An overall composite maternal sensitivity variable was computed as the mean of the sensitivity scores 6–54 months. Inter-coder reliability based on intraclass correlation coefficients (Winer, 1971) ranged from .83 to .88.

Maternal harsh control—At 54 months, mothers completed the Raising Children Checklist (Posner & Vandell, 1994), a 28-item questionnaire assessing parenting practices on a 4-point scale (1 = “Definitely No” to 4 = “Definitely Yes”). A sample item is “Do you expect your child to obey the first time you say something?” Factor analysis confirmed the existence of the three uncorrelated factors: harsh, firm, and lax. We computed an empirical harsh control composite as the sum of eight factor-based items ($\alpha = .71$).

Mother-child conflict—Mothers completed the 30-item Parent-Child Relationship Scale, an adaptation of the Student-Teacher Relationship Scale (Pianta, 2001), at 54 months. The conflict score is the sum of 12 items that assess the degree of negative interactions and emotions between parent and child, rated on a 1 to 5-point scale ($\alpha = .84$).

Child care quantity—Parents reported children’s hours of routine nonmaternal care during phone and personal interviews conducted at 3-month intervals from 3 months through 36 months and at 4-month intervals thereafter to 54 months, resulting in 17 intervals across this age period, as well as the type(s) of child care used (see below). The *hours* spent in all types of care were summed for each of the 17 intervals or “epochs” and parameterized on an hours-per-week basis.

Center-based care—For each epoch, each of the child's care arrangements was classified as center-based or some other type of care. The proportion of epochs in which the child received care in a center for at least 10 hours per week up to 54 months represented the amount of *center-based care*.

Measures of Adolescent Adjustment

At age 15, adolescents reported adjustment outcomes using an audio computer-assisted self-interview, including internalizing symptoms, delinquent behavior, depressive symptoms, and risk-taking.

Internalizing symptoms—Internalizing symptoms were measured with the Youth Self Report for Ages 11–18 (YSR; Achenbach, 2004). Youths rate how true each item is for them currently or within the past six months on a three-point (0–2) scale. The Internalizing T score is based upon the 31 items that comprise the Withdrawn, Somatic Complaints, and Anxious/Depressed scales. Possible scores range from 26 to 100 ($\alpha = .89$).

Delinquent behavior—The Externalizing scale on the YSR includes the Delinquent and Aggressive Behavior scales. Because we control for physical aggression in our analyses, we examine delinquent behavior at age 15. The YSR Delinquent Behavior T score is based on 11 items ($\alpha = .71$). The possible range of scores is from 50 to 100 and higher scores indicate a stronger affinity to demonstrate delinquent behaviors, including running away from home, stealing, and truancy.

Depressive symptoms—Depressive symptoms were assessed with the 10-item short form of the Children's Depression Inventory (CDI; Kovacs, 1992), tapping dysphoric mood, lack of pleasure, and low self-esteem. Items are rated on a 0–2-point scale to reflect symptoms in the past two weeks. A total score is computed as the sum of the item scores ($\alpha = .81$).

Risk-taking—Risk-taking was assessed with 36 items drawn from instruments used in prior studies of adolescents (Halpern-Felsher, Biehl, Kropp, & Rubinstein, 2004). Adolescents reported the extent to which, over the past year, they used alcohol, tobacco, or other drugs; behaved in ways that threatened their own safety (e.g., rode in a vehicle without the use of seatbelts); used or threatened to use a weapon; stole something; or harmed property. Responses were rated on a 3-point scale: 0 = *never*, 1 = *once or twice*, 2 = *more than twice*. Because most items were rated either 0 or 1, all items were recoded as never (0) or ever (1). Ratings were summed across component items and then subject to square root transformation to reduce skew and kurtosis.

Results

Descriptive statistics for relational aggression (RAgg) and physical aggression (PAgg) at Grades 3–6 and the results of *F*-tests for gender differences can be found in Table 1. Girls were more relationally aggressive than boys, and boys were more physically aggressive than girls, at each grade. RAgg and PAgg were correlated at each age; the range was $r = .40$ to $.46$ for girls, and $r = .49$ to $.63$ for boys. RAgg intercorrelations across this time period ranged from $r = .42$ to $.52$ for girls and $r = .38$ to $.49$ for boys. PAgg intercorrelations ranged from $r = .46$ to $.60$ for girls and $r = .47$ to $.56$ for boys. Zero-order correlations, descriptive statistics, and *F* ratios for gender differences for the demographic, family process, and child care predictors, and age 15 adolescent outcomes, are presented in Table 2. Mothers of girls had higher sensitivity ratings than mothers of boys. At age 15, girls were somewhat higher

on self reports of internalizing, delinquency, and depression, and boys reported more risk-taking behavior.

Analysis Strategy

Latent Curve Modeling (LCM) is one of many recent multilevel modeling approaches that can handle the repeated measures found in longitudinal designs. The analysis sample included those cases that had a RAgg score for at least one time point, resulting in $N = 1103$. Full Information Maximum Likelihood (FIML) was used for missing data in all analyses. The software used was MPlus v6.1 (Muthén & Muthén, 1998–2010).

The analyses proceeded in three steps. On the first step three LCM models with a linear structure to change over time were conducted with PAgg as a concurrent covariate. Model 1a is the unconditional linear model describing the developmental trajectory of RAgg across four assessments from Grade 3 to Grade 6 for the two growth parameters (intercept at Grade 3 and slope), with the parameters set to be equivalent for boys and girls. The fixed factor loadings for the linear slope are 0, 1, 2, 3, as is standard for these models. Model 1b was the same except that growth parameters were allowed to vary by gender. Finally, in Model 1c both RAgg growth parameters and PAgg covariates were allowed to vary by gender. The fit of the models was formally compared by using nested model chi-square tests (see Table 3). According to this formal assessment, allowing the growth parameters to vary by gender resulted in better model fit than the equivalent model. Allowing the covariate effect of concurrent physical aggression scores to vary by gender further improved model fit. Thus, in the subsequent two models both RAgg parameters and the covariate effect of PAgg were allowed to vary by gender.

All models fit the data well by CFI, TLI and RMSEA. Intermediate Model 2c was the conditional linear model with growth parameters, demographic and family process covariate effects on growth parameters, and PAgg covariates varying by gender. Final Model 3c was the same as Model 2c with the addition of age 15 outcomes, predictors of which were allowed to vary by gender. For model convergence, the variance of slope for girls was fixed to 0 (the variance estimate for slope for girls was negative, which is impossible and indicates that the parameter is inestimable), and only the intercept was used to predict age 15 outcomes. The fit of the models was formally compared by using nested model chi-square tests. Model 3c fit the data best.

Model Interpretation

For the unconditional model, Model 1c in Table 4, the trajectory parameters should be interpreted as the intercept and change over time in RAgg. The intercept is the 3rd grade RAgg score (2.75 for girls and 2.28 for boys) and the slope is the change per grade in RAgg (a nonsignificant $-.05$ for girls and significant $-.14$ for boys), meaning that on average RAgg did not decrease for girls and decreased at a rate of somewhat more than one tenth of a point a year for boys. Figure 1 compares the trajectories when growth parameters are equivalent for boys and girls compared to being allowed to vary by gender. The variances for RAgg intercept and RAgg slope are an index of individual variability in these trajectory parameters. Both are significant for girls and boys, meaning that there is individual variability in both intercept and slope that could be accounted for in subsequent models which will add early childhood predictors of RAgg. The trajectory parameters are exclusive of the effect of PAgg because PAgg was controlled as a time-varying covariate. The association of RAgg slope with RAgg intercept was also significant for both girls and boys. For both, higher intercepts were associated with more steeply declining slopes.

Table 5 shows the results of the final Model 3c, in which both the covariate predictors of individual variability in the trajectory parameters and age 15 outcomes predicted by the intercept are included. The structure of the final model is depicted in Figure 2. There were six significant predictors of RAgg intercept. Mother report of conflict at 54 months was predictive for both boys and girls (0.06 for girls, 0.02 for boys). For girls, for every point above the mean there is a 0.06-point change in 3rd grade RAgg score (intercept). Thus, for an approximately 1 *SD* increase of 8 points in mother-child conflict (see Table 2) there would be a predicted increase in 3rd grade RAgg of 0.48. For boys, the predicted increase would be .16. Maternal harsh control (0.07) predicted girls' RAgg, but not boys'. For an approximately 1 *SD* increase of 3 points in harsh control (see Table 2) there would be a predicted increase in 3rd grade RAgg of 0.21. Maternal sensitivity (–.13) also predicted girls' RAgg; an approximately 1 *SD* increase of 2 points in maternal sensitivity (see Table 2) predicted decrease in 3rd grade RAgg of –0.26. For boys, non-White status (.62) and center care (.62) also predicted RAgg intercept. For a boy whose proportion of center care increased by 1 *SD*, .26 (or, roughly, a quarter of the time between 3 and 54 months) there would be a 0.16 point increase in 3rd grade RAgg score (intercept). Non-White boys' RAgg intercept was on average 0.16 points higher as well. Recall that the unconditional model indicated that there was some variance in boys' RAgg slope that could be accounted for in subsequent models. Non-White status predicted a declining RAgg slope for boys only, amounting to –0.20 points per grade, accounting for some of that variance. A significant χ^2 in the last column means the value of that parameter, or the magnitude of the association, is significantly different for girls and boys. Only mother-child conflict and maternal harsh control differentially predicted RAgg intercept for boys and girls. That is, these family process variables mattered more for girls' RAgg intercept than for boys' RAgg intercept.

Table 5 also shows the results of age 15 outcomes added to the model to be predicted by the intercept. (Predictions from the slope had to be removed for the model to converge. As noted earlier, those parameters were non-estimable.) The RAgg intercept predicted higher *delinquency* (0.70 for girls, 1.13 for boys), more *risky behavior* (0.02 for girls, .08 for boys), and more *depressive symptoms* (.21 for girls only) at age 15. Only risky behavior was differentially related to the RAgg intercept for boys and girls, with a stronger association for boys.

Discussion

These results provide partial support for the conceptual model outlined by Ostrov and Godleski (2010). In the unconditional model we found gender differences in the growth parameters of relational aggression in late middle childhood, even after controlling for physical aggression. Specifically, girls had higher intercepts of relational aggression and did not exhibit a declining slope, and boys, for whom relational aggression would be a non-normative form, had lower intercepts and declining slopes, as predicted by Ostrov and Godleski. In the full multivariate model we found more maladaptive outcomes for adolescent girls with higher relational aggression at grade 3. Specifically, although higher relational aggression was associated with elevated self-reports of risk-taking and delinquency in both boys and girls at age 15, earlier relational aggression was also uniquely associated with girls' depressive symptoms. On the other hand, the magnitude of the association between relational aggression and risky behavior was significantly greater for boys, providing some support for the hypothesis that non-normative relational aggression in boys would be more detrimental to their adjustment than would be normative relational aggression in girls.

Mother-child conflict in early childhood also predicted the level of relational aggression at third grade for boys and girls, and other aspects of the mother-child relationship, maternal

harsh control and sensitivity, predicted relational aggression for girls but not boys. In addition, the relative magnitudes of these associations of relational aggression with both conflict and harsh control were significantly greater for girls than boys. The finding of more and stronger associations between family process variables and relational aggression in girls compared to boys supports Zahn-Waxler et al.'s (2005) speculation that girls' stronger interpersonal relationship orientation and greater receptivity to negative emotions in the family might result in more relational aggression among girls reared in these environments, although boys are not immune to the effects of family conflict. Although it is surprising that maternal depression did not predict girls' relational aggression, maternal depression is an indirect indicator of family relationship difficulties, whereas mother-child conflict, harsh control, and insensitivity are direct measures of relationship quality.

This study of gender differences in the developmental trajectory of relational aggression in late middle childhood and its early childhood predictors and adolescent consequences was undertaken when earlier assertions of gender differences in aggression types (Crick & Rose, 2000) were failing to find empirical support (Archer, 2004; Card et al., 2008). Ostrov and Godleski (2010) nevertheless presented the case for a gender-linked theory of aggression subtypes to move the field away from this more simplistic question and to consider causal mechanisms and prediction of outcomes. Our results provide some support for that aspect of their gender-linked theory of relational aggression which proposes that because girls are more tuned into interpersonal relations and base their potential aggressive responses on interpersonally-related social cognitions (Rose & Rudolph, 2006), they will be more negatively affected when they perform and receive relationally aggressive acts.

This study is the largest multivariate, prospective, longitudinal study of relational aggression to date. The sample, although not representative, was geographically diverse. Most children were the only study participant in their classrooms, and usually in their schools. Families were followed from infancy on a rich set of established self-report and observational measures. The analytic technique allowed for a direct comparison of the fit of two models: one in which parameters of relational aggression, predictors, and outcomes did not vary by gender, and one in which they did. The model with the best fit was the full multivariate model with all parameters varying by gender. Thus, we are confident that these results have implications for theory, future research, and clinical understanding of relational aggression, independent of physical aggression, which we controlled in all analyses.

Although a number of our hypotheses were confirmed, we did not find that self-reported internalizing symptoms in adolescence were predicted by relational aggression. Perhaps this is because the strongest association is with depressive symptoms *per se*, and not the anxiety and withdrawal symptoms that are also part of the internalizing construct. Because depression symptoms were represented in the model as a separate variable, there may not have been sufficient unique variance remaining for the internalizing construct.

Two findings regarding associations between early child care experience and relational aggression in middle childhood are noteworthy. First, amount of time in any type of child care was not associated with higher relational aggression, for girls or boys, in accord with Belsky et al.'s (2007) finding that associations between time in child care and children's aggression and externalizing behavior had dissipated by Grade 6. Second, contrary to our hypothesis, there was a modest association between center care experience and relational aggression only for boys. The NICHD SECCYD and meta-analyses in general (Card et al., 2008) find a stronger correlation between relational and physical aggression for boys than for girls. Possibly, boys will use any aggressive tactic available if one is needed, but girls are more selective, perhaps because of stronger gender-based schemas (Ostrov & Godleski, 2010). In that case, controlling for physical aggression would still result in boys being more

aggressive overall, and it may be that overall aggression is influenced by group care in early childhood, but not its form. Recent work suggests that modest links between child care quantity and children's later externalizing behaviors are moderated in part by the proportion of time spent with large groups of peers (McCartney et al., 2010). It is more likely that center-based care, compared to other forms of care, involves large peer groups, and this may explain our findings.

We expected that maternal depressive symptoms, harsh control, maternal insensitivity, and mother-child conflict would be associated with relational aggression, with the possibility of some differences in the patterning of these risk factors for boys and girls. Some of these predictions were confirmed. More mother-child conflict was associated with relational aggression in both boys and girls, whereas less maternal sensitivity and more harsh control predicted elevated relational aggression in girls only. As suggested by Ostrov and Godleski (2010), girls may be more likely to model negative and critical maternal behaviors when interacting with their peers.

Despite notable strengths, the study has important limitations. First, although the measure of relational aggression is an established one for teacher report (Crick et al., 1996), its use as a mother-report measure may be less valid because mothers have less opportunity to observe peer interactions, and have fewer same age comparisons available, than do teachers. The fact that we privileged the higher score for each item, regardless of reporter, meant that total scores would not be affected if mothers had less opportunity to observe relationally aggressive behaviors. Another limitation is that the SECCYD did not use self or peer reports. Peers, as the recipients and observers of aggression, may be more accurate reporters than either teachers or parents. Considerable research suggests that informants matter in studies of relational aggression, which may not always be performed when adults are present. Card et al. (2008) found that parent and teacher reports of child indirect aggression yielded gender differences in favor of girls, whereas self-reports yielded differences in favor of boys, and peer reports overall yielded negligible gender differences. In contrast, all informants agreed that boys show more direct aggression than girls. Third, non-White children were under-represented in the sample, so results may not be generalizable to them. We did find that, for boys only, minority status was associated with an elevated relational aggression intercept and a more steeply declining slope. Others have found elevated physical and relational aggression for non-White boys and girls (Crapanzano et al., 2010). Fourth, we did not differentiate between reactive and proactive forms of relational and physical aggression (Little et al., 2003). As the NICHD SECCYD is a public data set, future studies could address this by aggregating the items of proactive and reactive aggression separately, similar to an approach taken by Godleski and Ostrov (2010) with NICHD SECCYD data, for which they created a composite of hostile intent attributions in relationally and instrumentally provocative situations. We also could not identify targets of relational aggression, such as whether they were siblings, intimate friends, or more distant peers and classmates. Finally, the measures of early parenting focused only on mothers. Some researchers have found different associations depending on the gender composition of the parent-child dyad (e.g., Casas et al., 2006), and future secondary analyses of the NICHD SECCYD father data may be conducted to address this issue.

Concluding Remarks

The most important implication of this study is that relational aggression is not benign for boys or girls. It has its roots in family relationships in early childhood, and exerts a long-term influence on adjustment. There appear to be modest gender differences in amount and growth of relational aggression in middle childhood, as well as in its causes and outcomes. The idea that relational aggression, being non-normative for boys, would have more adverse outcomes for boys also received some support. The converse, that non-normative physical

aggression in girls would have especially negative outcomes for them, was not tested, but could be addressed in future studies with this data set. In this study, girls' relational aggression was more affected by family process variables, in particular the quality of the mother-daughter relationship, and girls were more likely to report depression compared to boys, as a consequence of relational aggression. The association between relational aggression in middle childhood and risky behavior in adolescence, however, was stronger for boys than for girls, providing some support for the adverse consequences for boys' non-normative relational aggression. Regarding prevention, in addition to promoting warmth, sensitivity and authoritative parenting, a focus on positive behavior management strategies to reduce parent-child conflict would be useful. As all of these family process variables also predict physical aggression, the payoff for this approach would be broadly positive for boys and girls. As such, the results of this study provide some clear guidelines for the prevention of peer relational aggression by focusing on early parent-child relationships.

References

- Achenbach, TM. Manual for the Child Behavior Checklist/4–18 and 1991 Profile. Burlington, VT: University of Vermont Department of Psychiatry; 1991a.
- Achenbach, TM. Manual for the Teacher's Report Form and 1991 Profile. Burlington, VT: University of Vermont Department of Psychiatry; 1991b.
- Achenbach, TM. Manual for the Youth Self Report for Ages 11–18. Burlington, VT: University of Vermont Department of Psychiatry; 2004.
- Archer J. Sex differences in aggression in real-world settings: A meta-analytic review. *Review of General Psychology*. 2004; 8(4):291–322.
- Belsky J, Vandell DL, Burchinal M, Clarke-Stewart KA, McCartney K, Owen MT. NICHD Early Child Care Research Network. Are there long-term effects of early child care? *Child Development*. 2007; 78:681–701. [PubMed: 17381797]
- Björkqvist K, Lagerspetz K, Kaukiainen A. Do girls manipulate and boys fight? Developmental trends in regard to direct and indirect aggression. *Aggressive Behavior*. 1992; 18(2):117–127.
- Broidy LM, Nagin DS, Tremblay RE, Bates JE, Brame B, Dodge KA, et al. Developmental trajectories of childhood disruptive behaviors and adolescent delinquency: A six-site, cross-national study. *Developmental Psychology*. 2003; 39:222–245. [PubMed: 12661883]
- Brown SA, Arnold DH, Dobbs J, Doctoroff GL. Parenting predictors of relational aggression among Puerto Rican and European American school-age children. *Early Childhood Research Quarterly*. 2007; 22:147–159.
- Campbell SB, Spieker S, Burchinal M, Poe MD. NICHD Early Child Care Research Network. Trajectories of aggression from toddlerhood to age 9 predict academic and social functioning through age 12. *Journal of Child Psychology and Psychiatry*. 2006; 47(8):791–800. [PubMed: 16898993]
- Campbell SB, Spieker S, Vandergrift N, Belsky J, Burchinal M. NICHD Early Child Care Research Network. Predictors and sequelae of trajectories of physical aggression in school-age boys and girls. *Development and Psychopathology*. 2010; 22:133–150. [PubMed: 20102652]
- Card NA, Stucky BD, Sawalani GM, Little TD. Direct and indirect aggression during childhood and adolescence: A meta-analytic review of gender differences, intercorrelations, and relations to maladjustment. *Child Development*. 2008; 79:1185–1229. [PubMed: 18826521]
- Casas JF, Weigel SM, Crick NR, Ostrov JM, Woods KE, Jansen Yeh EA, et al. Early parenting and children's relational and physical aggression in the preschool and home contexts. *Journal of Applied Developmental Psychology*. 2006; 27(3):209–227.
- Crapanzano AM, Frick PJ, Terranova AM. Patterns of physical and relational aggression in a school-based sample of boys and girls. *Journal of Abnormal Child Psychology*. 2010; 38:433–445. [PubMed: 20013045]
- Crick NR. The role of overt aggression, relational aggression, and prosocial behavior in the prediction of children's future social adjustment. *Child Development*. 1996; 67:2317–2327. [PubMed: 9022243]

- Crick NR. Engagement in gender normative versus non-normative forms of aggression: Links to social-psychological adjustment. *Developmental Psychology*. 1997; 33(4):610–617. [PubMed: 9232376]
- Crick NR, Grotpeter JK. Relational aggression, gender, and social-psychological adjustment. *Child Development*. 1995; 66(3):710–722. [PubMed: 7789197]
- Crick, NR.; Rose, AJ. Toward a gender-balanced approach to the study of social-emotional development: A look at relational aggression. In: Miller, PH., editor. *Toward a feminist developmental psychology*. New York: Taylor & Francis/Routledge; 2000. p. 153-168.
- Crick NR, Werner NE, Casas JF, O'Brien KM, Nelson DA, Grotpeter JK, Markon K. Childhood aggression and gender: A new look at an old problem. *Nebraska Symposium on Motivation*. 1999; 45:75–141. [PubMed: 10752059]
- Curtner-Smith ME, Culp AM, Culp R, Scheib C, Owen K, Tilley A, Murphy M, Parkman L, Coleman PW. Mothers' parenting and young economically disadvantaged children's relational and overt bullying. *Journal of Child and Family Studies*. 2006; 15(2):181–193.
- Galen BR, Underwood MK. A developmental investigation of social aggression among children. *Developmental Psychology*. 1997; 33(4):589–600. [PubMed: 9232374]
- Godleski SA, Ostrov JM. Relational aggression and hostile attribution biases: testing multiple statistical methods and models. *Journal of Abnormal Child Psychology*. 2010; 38(4):447–458. [PubMed: 20148303]
- Halpern-Felsher BL, Biehl M, Kropp RY, Rubinstein MD. Perceived risks and benefits of smoking: Differences between adolescents with different smoking experiences and intentions. *Preventive Medicine*. 2004; 39:559–567. [PubMed: 15313096]
- Hart CH, Nelson DA, Robinson CC, Olsen SF, McNeilly-Choque MK. Overt and relational aggression in Russian nursery-school-age children: Parenting style and marital linkages. *Developmental Psychology*. 1998; 34(4):687–697. [PubMed: 9681260]
- Herrenkohl TI, McMorris BJ, Catalano RF, Abbott RD, Hemphill SA, Toumbourou JW. Risk factors for violence and relational aggression in adolescence. *Journal of Interpersonal Violence*. 2007; 22:386–405. [PubMed: 17369443]
- Kovacs, M. *Children's Depression Inventory*. North Tonawanda, NY: Multi-Health Systems; 1992.
- Ladd GW, Kochenderfer-Ladd B. Identifying victims of peer aggression from early to middle childhood: Analysis of cross-informant data for concordance, estimation of relational adjustment, prevalence of victimization, and characteristics of identified victims. *Psychological Assessment*. 2002; 14(1):74–96. [PubMed: 11911051]
- Little TD, Jones SM, Henrich CC, Hawley PH. Disentangling the “whys” from the “whats” of aggressive behaviour. *International Journal of Behavioral Development*. 2003; 27:122–133.
- Maccoby, EE.; Jacklin, CN. Gender segregation in childhood. In: Rew, H., editor. *Advances in Child Development and Behavior*. Vol. 20. San Diego: Academic Press; 1987. p. 239-286.
- McCartney K, Burchinal M, Clarke-Stewart A, Bub KL, Owen MT, Belsky J. NICHD Early Child Care Research Network. Testing a series of causal propositions relating time in child care to children's externalizing behavior. *Developmental Psychology*. 2010; 46:1–17. [PubMed: 20053002]
- Murray-Close D, Ostrov JM, Crick NR. A short-term longitudinal study of growth of relational aggression during middle childhood: Associations with gender, friendship intimacy, and internalizing problems. *Development and Psychopathology*. 2007; 19:187–203. [PubMed: 17241490]
- Muthén, LK.; Muthén, BO. *Mplus User's Guide*. 6. Los Angeles, CA: Muthén & Muthén; 1998–2010.
- NICHD Early Child Care Research Network. Does amount of time spent in child care predict socioemotional adjustment during the transition to kindergarten? *Child Development*. 2003; 74:976–1005. [PubMed: 12938694]
- NICHD Early Child Care Research Network. Trajectories of physical aggression from toddlerhood to middle childhood. *Monographs of the Society for Research in Child Development*. 2004a; 69(4) Serial No. 278.
- NICHD Early Child Care Research Network. Type of care and children's development at 54 months. *Early Childhood Research Quarterly*. 2004b; 19:203–230.

- NICHD Early Child Care Research Network. Child care and child development: Results of the NICHD Study of Early Child Care and Youth Development. New York: Guilford; 2005.
- Ostrov JM, Godleski SA. Toward an integrated gender-linked model of aggression subtypes in early and middle childhood. *Psychological Review*. 2010; 117:233–242. [PubMed: 20063970]
- Park JH, Essex MJ, Zahn-Waxler C, Armstrong JM, Klein MH, Goldsmith HH. Relational and overt aggression in middle childhood: Early child and family risk factors. *Early Education and Development*. 2005; 16(2):233–256.
- Pianta, RC. Student-Teacher Relationship Scale: Professional manual. Odessa, FL: Psychological Assessment Resources; 2001.
- Posner JK, Vandell DL. Low-income children's after-school care: Are there beneficial effects of after-school programs? *Child Development*. 1994; 65:440–456. [PubMed: 8013233]
- Putallaz M, Grimes CL, Foster KJ, Kupersmidt JB, Coie JD, Dearing K. Overt and relational aggression and victimization: Multiple perspectives within the school setting. *Journal of School Psychology*. 2007; 45:523–547. [PubMed: 18836518]
- Radloff LS. The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*. 1977; 1:385–401.
- Rose AJ, Rudolph KD. A review of sex differences in peer relationship processes: potential trade-offs for the emotional and behavioral development of girls and boys. *Psychological Bulletin*. 2006; 132:98–131. [PubMed: 16435959]
- Tremblay RE, Japel C, Perusse D, McDuff P, Boivin M, Zoccolillo M, et al. The search for the age of 'onset' of physical aggression: Rousseau and Bandura revisited. *Criminal Behaviour and Mental Health*. 1999; 9(1):8–23.
- Underwood, MK. Social aggression among girls. New York: Guilford; 2003.
- Vandell DL, Belsky J, Burchinal M, Steinberg L, Vandergrift N. NICHD Early Child Care Research Network. Do effects of early child care extend to age 15 years? Results from the NICHD Study of Early Child Care and Youth Development. *Child Development*. 2010; 81:737–756. [PubMed: 20573102]
- Winer, BJ. Statistical principles in experimental design. 2. New York: McGraw-Hill; 1971.
- Zahn-Waxler C, Park JH, Essex M, Slattery M, Cole PM. Relational and overt aggression in disruptive adolescents: Prediction from early social representations and links with concurrent problems. *Early Education and Development*. 2005; 16(2):259–282.

Figure 1.
Trajectories for Boys and Girls from Model 1c and from Model 1a when Trajectories for Boys and Girls are Held Equivalent

Figure 2.
Schematic Representation of Final Multi-Group Model for Gender.

Table 1
Descriptive Statistics of Relational (RAgg) and Physical Aggression (PAgg) Grades 3–6

Variable	N	Boys		Girls		Difference	
		Mean	SD	Mean	SD	F	
RAgg G3	540	2.62	2.29	3.19	2.70	14.05	***
RAgg G4	534	2.58	2.37	2.90	2.53	4.60	*
RAgg G5	529	2.51	2.30	3.15	2.71	17.42	***
RAgg G6	519	2.41	2.36	2.90	2.45	10.67	**
PAgg G3	547	1.06	1.80	0.72	1.51	11.65	***
PAgg G4	535	1.01	1.84	0.56	1.19	22.78	***
PAgg G5	527	1.03	1.87	0.57	1.33	21.50	***
PAgg G6	519	0.94	1.73	0.47	1.08	27.78	***

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Zero Order Correlations, Descriptive Statistics, and F ratios for Gender Differences among Demographic, Family Process and Child Care Predictors, and Age 15 Child Outcomes

Table 2

Boys												
Income	Mother Ed	Nonwhite	Mother Depression	Maternal Sensitivity	Mother-Child Conflict	Harsh Control	Child Care Hours	Center Care	Internalizing 15 years	Delinquency 15 years	Depression 15 years	Risky Behavior 15 years
Inc	1.000											
Ed	0.54	1.000										
NonW	-0.17	-0.14	1.00									
Dep	-0.31	-0.36	0.19	1.00								
Sens	0.35	0.43	-0.40	-0.36	1.00							
Conf	-0.13	-0.14	0.03	0.37	-0.17	1.00						
Harsh	-0.32	-0.31	0.28	0.21	-0.34	0.09	1.00					
Hours	0.21	0.10	0.04	-0.07	0.01	0.06	1.00					
Center	0.20	0.17	-0.01	-0.04	-0.01	-0.09	0.39	1.00				
Int	-0.04	-0.06	-0.00	0.08	-0.07	0.01	-0.02	-0.07	1.00			
Del	-0.10	-0.08	0.10	0.08	-0.11	-0.00	0.05	0.01	0.39	1.00		
Dep	-0.04	-0.01	0.02	0.09	-0.06	0.04	-0.04	-0.01	0.62	0.36	1.00	
Risk	-0.18	-0.15	0.25	0.12	-0.16	0.17	0.05	0.02	0.11	0.51	0.14	1.000
n	502	558	554	554	506	498	558	537	477	478	478	478
Range	.1-18.6	7-21	0-1	0-37.8	12-52	13-30	0-52.2	0-9	26-83	50-85	0-12	0-2
M	3.5	14.3	.2	9.3	27.4	21.1	23.6	.2	46.6	53.9	1.5	.2
(SD)	2.6	2.5	.4	6.7	7.7	3.1	14.0	.3	10.3	6.0	2.1	.2

Girls

Income	Mother Ed	Nonwhite	Mother Depression	Maternal Sensitivity	Mother-Child Conflict	Harsh Control	Child Care Hours	Center Care	Internalizing 15 years	Delinquency 15 years	Depression 15 years	Risky Behavior 15 years
Inc	1.00											
Ed	0.46	1.00										
NonW	-0.24	-0.27	1.00									
Dep	-0.24	-0.27	0.19	1.00								
Sens	0.32	0.46	-0.38	-0.29	1.00							

Girls													
	Income	Mother Ed	Nonwhite	Mother Depression	Maternal Sensitivity	Mother-Child Conflict	Harsh Control	Child Care Hours	Center Care	Internalizing 15 years	Delinquency 15 years	Depression 15 years	Risky Behavior 15 years
Conf	−0.09	−0.11	0.04	0.38	−0.15	1.00							
Harsh	−0.27	−0.37	0.30	0.17	−0.39	0.13	1.00						
Hours	0.08	0.11	−0.00	−0.09	−0.01	0.04	−0.04	1.00					
Center	0.10	0.11	0.03	0.01	0.02	0.07	−0.04	0.38	1.00				
Int	−0.14	−0.05	0.05	0.13	−0.04	0.09	−0.02	0.01	−0.01	1.00			
Del	−0.12	−0.12	0.06	0.10	−0.12	0.12	0.05	0.01	0.01	0.37	1.00		
Dep	−0.06	0.02	−0.03	0.08	0.03	0.09	−0.04	0.02	−0.01	0.72	0.31	1.00	
Risk	−0.19	−0.20	0.13	0.16	−0.24	0.11	0.16	0.02	0.03	0.28	0.75	0.20	1.00
Descriptive Statistics													
<i>n</i>	515	545	545	542	542	514	507	545	534	479	479	479	479
Range	.1–57	7–21	0–1	0–36.7	5.3–15.8	12–53	12–30	0–57	0–9	26–90	50–91	0–18	0–1.4
<i>M</i>	3.7	14.5	.2	9.4	12.5	27.4	21.3	24.0	.2	48.0	54.8	2.5	.15
(<i>SD</i>)	3.7	2.4	.4	6.6	1.7	7.6	3.5	14.2	.3	10.0	6.7	3.0	.15
<i>F</i>	1.6	1.7	0.0	0.1	10.3**	0.0	1.0	0.2	0.0	4.9*	4.6*	38.3***	33.3***

Correlation coefficients > .09 are significant at p< .05; Correlation coefficients > .10 are significant at p< .01

* *p* < .05;
** *p* < .01;
*** *p* < .001

Table 3

Model Fit and Comparisons of Parameters Varying by Gender

Statistic	Model 1a	Model 1b	Model 1c	diff a & b	diff b & c	Model 2c	Model 3c
Chi	111.44	33.924	22.303	77.516	11.621	146.034	417.036
df	26	22	18	4	4	106	305
p-value	0.0000	0.0500	0.2188	0.0000	0.0204	0.0061	0.0000
CFI	0.955	0.994	0.998			0.980	0.967
TLI	0.924	0.987	0.994			0.964	0.956
RMSEA	0.077	0.031	0.021			0.026	0.026

Note. Model 1a is a two-group model with growth curve parameters constrained across gender; Model 1b is the same except that growth parameters were allowed to vary by gender; in Model 1c both R/Agg growth parameters and P/Agg covariates were allowed to vary by gender.

Table 4

Model 1c: Unconditional Growth Parameters of RAgg Grades 3–6, with Growth Parameters and PAgg Varying by gender

	<u>Girls</u>				<u>Boys</u>			
	Est	SE	Z	p	Est	SE	Z	p
<u>Intercepts</u>								
RAgg Intercept	2.75	0.12	23.47	0.000	2.28	0.12	19.80	0.000
RAgg Slope	−0.05	0.05	−0.96	0.336	−0.14	0.06	−2.44	0.015
<u>Variances</u>								
RAgg Intercept	3.14	0.37	8.39	0.000	1.81	0.30	5.99	0.000
RAgg Slope	0.15	0.06	2.35	0.019	0.11	0.05	2.25	0.024
<u>RAgg Slope WITH</u>								
RAgg Intercept	−0.35	0.13	−2.78	0.005	−0.22	0.11	−2.02	0.044
<u>Covariate Effects of Physical Aggression</u>								
G3 PAgg	0.59	0.10	5.68	0.000	0.31	0.09	3.53	0.000
G4 PAgg	0.49	0.09	5.69	0.000	0.45	0.06	8.23	0.000
G5 PAgg	0.71	0.08	8.39	0.000	0.49	0.05	9.83	0.000
G6 PAgg	0.69	0.16	4.25	0.000	0.57	0.08	6.88	0.000

Table 5

Model 3c: Growth Parameters of RAgg Grades 3–6, with Demographic, Family Process, and Child Care Predictors and Age 15 Adjustment Outcomes, with Growth Parameters and PAgg Varying by Gender, and 1 df χ^2 Testing Gender Differences for Each Intercept Parameter.

	Girls				Boys			
	Est	SE	Z	p	Est	SE	Z	χ^2
Intercepts								
RAgg Intercept	2.21	0.32	6.97	0.000	2.39	0.23	10.19	0.000
RAgg Slope	0.27	0.13	2.07	0.039	-0.18	0.11	-1.66	0.098
Variances								
RAgg Intercept	1.79	0.16	10.93	0.000	0.94	0.12	7.85	0.000
RAgg Slope	0.00				0.02	0.03	0.75	0.454
Predictors of Intercept and Slope								
RAgg Intercept								
Income	0.01	0.03	0.51	0.609	-0.01	0.03	-0.32	0.749
Maternal Ed	-0.05	0.05	-1.06	0.290	-0.03	0.04	-0.76	0.446
Non-White	-0.32	0.26	-1.23	0.217	0.62	0.20	3.10	0.002
Mat. Depression	0.01	0.02	0.90	0.367	0.01	0.01	1.03	0.304
Mat. Sensitivity	-0.13	0.07	-2.02	0.044	-0.05	0.05	-0.93	0.352
Conflict 54 mo	0.06	0.01	4.59	0.000	0.02	0.01	2.43	0.015
Harsh Ctrl 54 mo	0.07	0.03	2.33	0.020	-0.01	0.03	-0.29	0.771
Hours of Care	0.01	0.01	1.47	0.141	0.00	0.01	0.67	0.501
Center Care	0.48	0.39	1.23	0.219	0.62	0.30	2.03	0.043
RAgg Slope								
Income	0.00	0.01	0.18	0.854	-0.02	0.02	-0.97	0.334
Maternal Ed	-0.02	0.02	-1.05	0.293	-0.01	0.02	-0.39	0.694
Non-White	0.19	0.10	1.90	0.058	-0.20	0.09	-2.21	0.027
Mat. Depression	-0.01	0.01	-1.39	0.165	0.00	0.01	-0.19	0.852
Mat. Sensitivity	0.04	0.03	1.45	0.147	0.00	0.02	-0.03	0.978
Conflict 54 mo	0.00	0.01	-0.74	0.462	0.00	0.01	-0.35	0.727
Harsh Ctrl 54 mo	-0.01	0.01	-0.81	0.418	0.00	0.01	0.02	0.986
Hours of Care	0.00	0.00	-0.90	0.366	0.00	0.00	-0.42	0.675
Center Care	-0.14	0.16	-0.92	0.360	-0.21	0.14	-1.50	0.134

	<u>Girls</u>				<u>Boys</u>				χ^2
	Est	SE	Z	p	Est	SE	Z	p	
<u>Age 15 Outcomes</u>									
Internalizing	0.35	0.33	1.05	0.296	-0.40	0.69	-0.58	0.560	0.7
Delinquency	0.70	0.22	3.17	0.002	1.13	0.40	2.82	0.005	1.6
Ch. Depression	0.21	0.10	2.16	0.031	0.13	0.14	0.93	0.350	0.9
Risk Taking	0.02	0.01	4.17	0.000	0.08	0.01	5.33	0.000	24.4****
<u>Covariate Effects of Physical Aggression</u>									
G3 PAgg	0.60	0.06	9.76	0.000	0.47	0.05	10.55	0.000	
G4 PAgg	0.55	0.07	7.78	0.000	0.58	0.04	14.25	0.000	
G5 PAgg	0.75	0.07	11.46	0.000	0.59	0.04	15.21	0.000	
G6 PAgg	0.76	0.08	9.47	0.000	0.73	0.05	15.97	0.000	