Published in final edited form as:

J Adolesc. 2013 October ; 36(5): 797–806. doi:10.1016/j.adolescence.2013.06.005.

Predictors and Consequences of Developmental Changes in Adolescent Girls' Self-Reported Quality of Attachment to their Primary Caregiver

Lori N. Scott^a, Diana J. Whalen^b, Maureen Zalewski^a, Joseph E. Beeney^a, Paul A. Pilkonis^a, Alison E. Hipwell^a, and Stephanie D. Stepp^a

^aUniversity of Pittsburgh School of Medicine, Department of Psychiatry, 3811 O'Hara Street, Pittsburgh, PA 15213, USA

^bUniversity of Pittsburgh, Department of Psychology, 210 South Bouquet Street, Pittsburgh, PA 15260, USA

Abstract

In an at-risk community sample of 2,101 girls, we examined trajectories, predictors, and consequences of changes in a central aspect of adolescents' perceived quality of attachment (QOA), i.e., their reported trust in the availability and supportiveness of the primary caregiver. Results demonstrated two distinct epochs of change in this aspect of girls' perceived QOA, with a significant linear decrease in early adolescence (ages 11 to 14) followed by a plateau from 14 to 16. Baseline parent-reported harsh punishment, low parental involvement, single parent status, and child-reported depression symptoms predicted steeper decreases in attachment during early adolescence, which in turn predicted greater child-reported depression and conduct disorder symptoms in later adolescence. Results suggest that both parent and child factors contribute to trajectories of self-reported QOA in adolescence, and a faster rate of decrease in girls' perceived QOA to caregivers during early adolescence may increase risk for both internalizing and externalizing symptoms.

Keywords

adolescence; adolescent girls; attachment; parenting; depression; conduct disorder

Beliefs about the availability, sensitivity, and supportiveness of caregivers are core aspects of secure attachment (e.g., Bowlby, 1988; Mikulincer, Florian, Cowan, & Cowan, 2002; Waters, Rodrigues, & Ridgeway, 1998). Evidence suggests the importance of quality of attachment (QOA) to caregivers across developmental stages, including adolescence (Brumariu & Kerns, 2010; Sroufe, 2005). Despite adolescents' normative efforts toward independence from parents and increased reliance on peers as attachment figures (Steinberg, 2001; Nickerson & Nagle, 2005), these developmental tasks appear to be more easily achieved in the context of enduring QOA to caregivers (Allen & Land, 1999; Laible, 2007).

© 2013 The Association for Professionals in Services for Adolescents. Published by Elsevier Ltd. All rights reserved.

Correspondence should be sent to Stephanie Stepp, Western Psychiatric Institute and Clinic, 3811 O'Hara St., Pittsburgh, PA 15213. steppsd@upmc.edu; Telephone: 412-383-5051; Fax: 412-383-5068.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

QOA may be particularly important for adolescent girls' adjustment considering that girls are more relationally oriented and sensitive to relational stressors than their male counterparts (Seiffge-Krenke & Stemmler, 2002). However, given the demonstrated malleability of attachment with significant life events and stressors (e.g., Waters, Merrick, Treboux, Crowell, & Albersheim, 2000) and the substantial changes in cognitive and relational functioning that occur during adolescence (Steinberg, 2001), there may be significant individual-level change in QOA to caregivers in this phase, especially in high-risk samples. Such individual changes may have important implications for subsequent adjustment. Accordingly, in a large at-risk sample of girls, the current study aimed to prospectively examine trajectories, predictors, and consequences of within-individual changes in an important aspect of adolescents' perceived QOA to caregivers, i.e., their self-reported level of trust in their primary caregiver's availability, supportiveness, and understanding.

Findings are mixed regarding the normative trajectory of QOA during adolescence, and vary according to method of assessing attachment-related constructs, sample characteristics, and length of longitudinal follow-up. Although several studies have found that general representations of attachment security, as assessed by interview methods, remain relatively stable during adolescence in low- to moderate-risk samples (e.g., Allen, McElhaney, Kuperminc, & Jodl, 2004; Ammaniti, van IJzendoorn, Speranza, & Tabelli, 2000; Zimmermann & Becker-Stoll, 2002), evidence suggests that global attachment security may be less stable across developmental stages (e.g., infancy to adolescence or adulthood) in high-risk samples (Beijersbergen, Juffer, Bakermans-Kranenburg, & van IJzendoorn, 2012; Weinfield, Sroufe, & Egeland, 2000; Weinfield, Whaley, & Egeland, 2004). Evidence also suggests that adolescents' *self-reported* QOA to *specific* attachment figures may be more malleable over time than their global sense of attachment, even among low-risk youth, and especially when attachment is assessed over longer developmental periods (Buist, Dekovi, Meeus, & van Aken, 2002). For example, in a sample of predominantly middle class adolescents from two-parent households, Buist et al. (2002) found that adolescents' perceived QOA to their same-sex caregivers showed a linear decline from ages 11 to 17, and QOA to opposite-sex caregivers showed nonlinear change with the most rapid decrease in early adolescence (i.e., up to age 14 or 15). These findings might suggest that decrements in adolescents' self-reported QOA to specific caregivers during this period may be somewhat normative, especially in early adolescence, and may simply reflect increasing autonomy, deidealization of parents, and increased reliance on non-parental attachment figures.

On the other hand, several studies indicate that decreases in QOA during adolescence follow predictably from negative life events and parenting practices (e.g., harsh or unsupportive parenting) as well as from child psychopathology symptoms (e.g., Aikins, Howes, & Hamilton, 2009; Allen, McElhaney, Kuperminc, & Jodl, 2004; Buist, Reitz, & Dekovi, 2008; Van Ryzin, Carlson, & Sroufe, 2011). Harsh parenting combined with low parental involvement during this developmental phase might reduce adolescents' feelings of safety and support in their relations with caregivers. In addition, poverty and associated risk factors may influence the consistency, quality, and availability of caregivers and increase adolescents' vulnerability to negative life experiences, thereby influencing the continuity of adolescents' QOA (Carlivati & Collins, 2007). Adolescents' internalizing and externalizing symptoms might also affect their perceptions of caregivers' availability and supportiveness, evoke negative parenting behaviors, and cause disruptions in the family environment, leading to decreases in QOA (Laible, Carlo, & Raffaelli, 2000). Thus, decreases over time in adolescents' QOA to caregivers may be an indicator of risk rather than a normative developmental process.

Studies examining developmental outcomes of adolescent attachment-related processes have found adolescent psychopathology symptoms may function as both a predictor and a consequence of decreasing QOA during adolescence. One longitudinal study found that attachment insecurity during early adolescence predicted increasing trajectories of externalizing behavior and consistently higher levels of depressive symptoms across a three-year period (Allen, Porter, McFarland, McElhaney, & Marsh, 2007). In addition, decreases in QOA during adolescence are associated with the development of both internalizing and externalizing symptoms (Allen et al., 2002; Higgins, Jennings, & Mahoney, 2010). One study found reciprocal negative effects for perceived QOA to parents and internalizing and externalizing behaviors across a three-year period (Buist, Deković, Meeus, & van Aken, 2004). Further, both cross-sectional (e.g., Bosmans, Braet, Beyers, Van Leeuwen, & Van Vlierberghe, 2011; Bosmans, Braet, Leeuwen, & Beyers, 2006; Gallarin & Alonso-Arbiol, 2012) and longitudinal studies (Doyle & Markiewicz, 2005; Hankin, 2005) suggest that associations between negative parenting practices and adolescent psychosocial functioning or psychopathology are mediated at least in part by attachment-related processes.

Taken together, evidence suggests that low or decreasing QOA during adolescence may be a critical indicator of risk for maladjustment. This may be particularly relevant among girls considering that associations between low QOA to caregivers and psychopathology are stronger among girls than boys (e.g., Crawford, Cohen, Midlarsky, & Brook, 2001; Seiffge-Krenke & Stemmler, 2002). No published studies, to our knowledge, have examined the mediating role of *rates of change* in QOA during adolescence in associations between earlier risk factors and psychopathology outcomes.

The current study prospectively assessed an important aspect of adolescent girls' perceived QOA to a specific caregiver, i.e., the degree to which they reported feelings of trust in the availability, sensitivity, and supportiveness of their primary caregiver. This study had four specific aims: 1) to examine age-related changes in this aspect of girls' self-reported QOA to their primary caregiver from early to middle adolescence (ages 11 to 16) in a high-risk community sample; 2) to determine the baseline sociodemographic, child, and parental risk and protective factors that predict initial levels and trajectories of this aspect of QOA over time; 3) to examine how initial levels and trajectories of QOA during adolescence predict girls' psychopathology outcomes (i.e., depression and conduct disorder [CD] symptoms) the following year; and 4) to examine indirect effects of parenting practices and other baseline risk factors on girls' psychopathology outcomes via initial levels and trajectories of QOA. We hypothesized that this aspect of girls' QOA to caregivers would show a pattern of decline, with the most rapid change occurring in early adolescence, and that lower initial levels and steeper decreases in QOA would be predicted by harsh parenting, low parental involvement, and child depression and CD symptoms at baseline. We also hypothesized that steeper decreases in QOA would predict greater psychopathology symptoms in later adolescence and mediate associations between baseline parenting-related factors and symptom outcomes.

Method

Sample Description

The current study utilized data collected within the Pittsburgh Girls Study (PGS; $N=2,451$), which includes an urban community sample of four age cohorts of girls and their primary caregivers who have been followed with annual assessments since 2000. The recruitment and assessment procedures for the PGS are described in detail elsewhere (see Hipwell et al., 2002). Briefly, the sample was identified by oversampling from low-income areas, such that neighborhoods in which at least 25% of families were living at or below poverty level were fully enumerated and a random selection of 50% of households in all other neighborhoods

were enumerated. Data were collected through annual face-to-face interviews in participants' homes. Interviews were conducted separately with girls and caregivers. At the first interview, 588 of the girls were five, 630 were six, 611 were seven, and 622 were eight years old.

For the present study, we analyzed data across five consecutive waves of data collection (waves 6–10), including QOA to the primary caregivers assessed from waves 6–9, baseline predictors (i.e., sociodemographic variables, parenting practices, and child depression and CD symptoms) assessed at wave 6, and child-reported depression and CD symptom outcomes assessed at wave 10.¹ Because analyses focused on changes in QOA to a specific caregiver, we included only those girls whose primary caregiver remained the same across all five waves of data collection, utilizing 85.7% ($n=2,101$) of the original PGS sample. Attrition analyses showed that girls who were retained for analysis did not differ from those who were excluded or lost to follow-up on family poverty or single parenthood at baseline, but those who were included in the analyses were more likely to be minority race than those who were not, $\chi^2(1)=9.25, p=.002$. The majority of girls in the analyzed sample (90.2%) had no missing QOA assessments across the included assessment waves. Fifty-three percent of the analyzed sample was African-American, 41% was Caucasian, 1% was Asian, and 5% was multi-racial. The majority of caregivers were female (95%); 93% of caregivers were a biological parent, 42% were single parents, and 37% reported receiving some form of public assistance (e.g., food stamps, welfare, etc.). About half of caregivers (54%) had completed more than 12 years of education, and 13% completed less than 12 years of education. Caregivers' ages at the wave 6 assessment ranged from 22 to 79 years ($M=39.45, SD=8.05$).

Measures

Sociodemographic Covariates—We included minority race (0=*Caucasian*, 1=*minority race*), family poverty (0=*no receipt of public assistance*, 1=*receipt of public assistance*), and single parent status (0=*cohabitating*, 1=*single parent*) as baseline sociodemographic covariates.²

Quality of Attachment—QOA was assessed at waves 6–10 using items from the Revised Inventory of Parent and Peer Attachment (IPPA-R; Gullone & Robinson, 2005) Trust subscale. The IPPA (Armsden & Greenberg, 1987) was developed to assess the affective/cognitive dimension of adolescents' relationships with caregivers and close friends, and has demonstrated convergent validity with other self-report measures of attachment quality and family functioning (e.g., Burge et al., 1997; Muris, Meesters, van Melick, & Zwambag, 2001; Sternberg, Lamb, Guterman, Abbott, & Dawud-Noursi, 2005). The IPPA-R includes an overall Attachment scale and three subscales: Trust, Communication, and Alienation. The Trust subscale of the IPPA-R is comprised of 10 items that assess the adolescent's trust in the availability and sensitivity of an attachment figure and their perception of mutual understanding and respect in the relationship (e.g., *My parents respect my feelings; When I talk about things with my parents they listen to what I think*). The Trust scale is highly correlated with the overall Attachment to parents scale ($r's=.86-.90$; Gullone & Robinson, 2005), and therefore, provides a good estimate of an adolescent's overall QOA to caregivers.

¹QOA to the primary caregiver was assessed beginning at wave 6 for the three oldest cohorts (cohorts 6, 7, and 8) and beginning at wave 7 for the youngest cohort (cohort 5). All baseline predictors were assessed in the same year as the first QOA assessment (i.e., wave 7 for cohort 5 and wave 6 for all other participants). Therefore, analyses included QOA assessed at waves 6–9 for cohorts 6, 7, and 8 and QOA at waves 7–9 for cohort 5.

²We also considered including caregiver gender and biological parent status as covariates; however, these variables were highly skewed given that 95% of caregivers were female and 93% were a biological parent. In addition, these factors did not emerge as significant predictors of QOA growth factors, and results were similar when analyses were restricted to only those girls with female caregivers or biological parents. Therefore, we did not include caregiver gender or biological parent status as covariates in the final reported model.

One item, *My parents expect too much from me*, was not administered because it had the lowest factor loading on the Trust factor and the lowest item-total correlation in previous studies; Armsden & Greenberg, 1987). Items were worded to refer to the adolescent's perceptions of the primary caregiver and were scored on a 3-point scale (1=*never true*, 2=*sometimes true*, 3=*always true*). The average internal consistency coefficient for QOA across ages 11–16 was $\alpha=0.90$, with values ranging from $\alpha=0.85$ (age 11) to $\alpha=0.92$ (age 16).

Parenting practices—Harsh punishment was assessed at baseline using caregiver reports on the Conflict Tactics Scale: Parent-Child version (CTSPC; Straus, Hamby, Finkelhor, Moore, & Runyan, 1998). Using caregiver reports, we were able to avoid shared method variance. Five items from the psychological aggression subscale (e.g., *In the past year, if your daughter did something that she is not allowed to do or something that you didn't like, how often did you shout, yell, or scream at her?*) were combined with a single item on spanking to produce the harsh punishment construct. Items were scored on a 3-point scale (1=*never*, 2=*sometimes*, 3=*often*). Satisfactory discriminant and construct validity has been previously reported for the psychological aggression scale (Straus et al., 1998). The internal consistency of the harsh punishment construct at baseline in the current study was $\alpha=.74$.

Parental involvement was assessed at baseline with parent reports on five items from the Supervision/Involvement Scale (Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1998) assessing the frequency of parents' engagement in conversations and activities with their child. Items were scored on a 3-point scale (1=*almost never*, 2=*sometimes*, 3=*often*). This construct had an internal consistency at baseline of $\alpha=.66$.

Adolescent Depression and CD Symptom Severity—Past-year depression and CD symptom severity was assessed with girls' reports at baseline using the Child Symptom Inventory-4th edition (CSI-4; Gadow & Sprafkin, 1997b) and at wave 10 using the Adolescent Symptom Inventory-4th edition (ASI-4; Gadow & Sprafkin, 1997a). The CSI-4/ASI-4 includes DSM-IV (American Psychiatric Association, 1994) symptoms of depression and CD scored on a four-point scale (0=*never* to 3=*very often*). Severity scores (sum of items) were used to ensure sufficient variability in outcomes. Adequate concurrent validity, sensitivity, and specificity of depression and CD symptom severity scores to clinicians' diagnoses have been reported (Gadow & Sprafkin, 1997a, 1997b). The internal consistency coefficients were $\alpha=.75$ for baseline depression, $\alpha=.70$ for baseline CD, $\alpha=.83$ for wave 10 depression, and $\alpha=.74$ for wave 10 CD severity.

Analytic Procedures

Hypotheses were tested using latent growth curve models (LGCMs; Duncan, Duncan, & Strycker, 2006). A cohort-sequential design was used, in which data from the four age cohorts across four waves was combined to create a longitudinal trajectory of QOA spanning ages 11 to 16. Models were estimated with Mplus 6.1 (Muthén & Muthén, 2010) using full-information maximum likelihood estimation with robust standard errors (MLR estimator), which can include missing data and is robust to non-normality. Due to the sensitivity of χ^2 likelihood ratio test to large samples, we did not rely solely on this index to evaluate model fit. Instead, model fit was evaluated holistically by examining multiple indices, including the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). Conventional guidelines for evaluating good model fit were followed (e.g., CFI/TLI $\geq .95$; RMSEA $< .05$; SRMR $< .08$; Hu & Bentler, 1999; McDonald & Ho, 2002). Indirect effects were tested using the "model indirect" command in Mplus, which uses the delta method to calculate standard errors (MacKinnon, 2008).

Results

Evaluating Change in QOA over Time

Descriptive statistics and correlations for all study variables are presented in Table 1. To examine the developmental growth trajectory of QOA and variability around this trajectory, an unconditional linear growth model was initially fit to the QOA data (waves 6 through 9) at ages 11 to 16. The linear model provided inadequate fit according to most indices, $\chi^2(13, N=2101)=118.19, p<.001, RMSEA=.06, CFI=.93, TLI=.94, SRMR=.30$. Examination of plotted sample means suggested that QOA appeared to show a pattern of nonlinear change with the most rapid decrease from ages 11–14. We therefore tested a piecewise model (Llabre, Spitzer, Saab, & Schneidman, 2001) with “slope 1” representing linear change from ages 11–14 and “slope 2” representing linear change from ages 14–16. The intercept represents the estimated initial level of QOA at the beginning of slope 1. This model fit the data well according to most indices, $\chi^2(9, N=2101)=43.89, p<.001, RMSEA=.04, CFI=.98, TLI=.97, SRMR=.09$, and was retained as the final unconditional model. The intercept ($M=25.61, z=414.38$) and slope 1 ($b=-0.58, z=-19.47$) differed significantly from 0 (p 's<.001), but slope 2 did not ($b=-0.09, z=-1.51, ns$). Thus, QOA to primary caregivers showed a pattern of linear decrease from ages 11–14, but did not change significantly from ages 14–16.³ Significant individual variability was found for the intercept ($\chi^2=4.10, z=8.94, p<.001$) and both slopes (slope 1: $\chi^2=.68, z=6.95, p<.001$; slope 2: $\chi^2=.65, z=1.97, p=.05$).

Predictors of Initial Level and Developmental Changes in QOA

Next, we tested a conditional model with QOA growth parameters regressed on baseline covariates, and with wave 10 depression and CD symptom severity outcomes regressed on QOA growth parameters. To control for the significant influence of baseline QOA levels on change in QOA over time, we regressed both QOA slopes on the QOA intercept. Higher baseline QOA levels (intercept) significantly predicted steeper declines in QOA during both developmental phases (slopes 1 and 2). The conditional model fit the data well, $\chi^2(37, N=2057)=75.06, p<.001, RMSEA=.02, CFI=.99, TLI=.97, SRMR=.03$. Standardized model coefficients are presented in Table 2. None of the demographic variables (minority race, single parent status, or family poverty) predicted initial QOA levels. After controlling for these factors, greater harsh punishment and child depression and CD symptom severity at baseline predicted lower QOA intercepts, whereas, greater parental involvement predicted higher QOA intercepts. Single parent status, harsh punishment, and baseline child depression severity were also negatively related to slope 1, indicating that these factors predicted steeper decreases in QOA from ages 11–14. On the other hand, greater parental involvement and higher child-reported CD symptom severity at baseline predicted slower decreases in QOA from 11–14. None of the baseline covariates significantly predicted rates of change in QOA from ages 14–16 (slope 2).

To further probe these relations between predictors and change in QOA, we plotted model-implied trajectories of QOA for ages 11–14 at each level of significant dichotomous predictors (i.e., single parent) and among those scoring 1 SD above and below the means of continuous predictors.⁴ This procedure enhances interpretability of covariate effects on

³We also tested a nonlinear model with freely estimated time scores at ages 14, 15, and 16. The nonlinear model fit the data adequately, $\chi^2(10, N=2101)=43.82, p<.001, RMSEA=.04, CFI=.98, TLI=.97, SRMR=.097$, with a significant negative slope ($b=-0.49, z=-20.23, p<.001$). However, this model only describes change in QOA from ages 11 to 14 and does not adequately characterize the QOA trajectory from ages 14 to 16. Because this lack of precision could potentially influence interpretation of final conditional model results, we elected to conduct subsequent analyses with the piecewise model rather than the single nonlinear trajectory.

⁴Due to extreme zero inflation in the baseline CD severity level (indicating low base rate of CD symptoms), the lowest possible standardized score for this construct was $Z=-0.56$. Therefore, model-implied trajectories of QOA were plotted for girls 1 SD above and $\frac{1}{2}$ SD below the sample mean on baseline CD severity.

slopes, which may reflect a variety of relations (Curran, Bauer, & Willoughby, 2004). Results suggested that girls with single parents, greater parent-reported harsh punishment, lower parental involvement, and greater baseline depression severity had steeper negative slopes in their trajectories of QOA from ages 11–14 than those without these risk factors. However, even those without these risk factors demonstrated significant decreases in QOA, albeit at slower rates. Results also suggested a potential floor effect that might explain the paradoxical positive relationship between baseline CD symptom severity and QOA trajectories from ages 11–14, and the negative relationship between initial QOA levels (intercept) and both QOA slopes. Although girls without CD symptoms at baseline showed a slightly steeper decline in QOA over time ($b=-0.58$, $z=-17.46$, $p<.001$) in comparison to those with high CD symptoms ($b=-0.38$, $z=3.32$, $p=.001$), these slopes did not differ significantly in magnitude (Wald $\chi^2(1)=1.10$, ns). In addition, girls without CD symptoms at baseline had significantly higher initial QOA levels ($M=26.22$, $z=478.31$, $p<.001$) as compared to those with high CD symptoms at baseline ($M=24.00$, $z=89.79$, $p<.001$; Wald $\chi^2(1)=7.25$, $p=.007$). A similar pattern was discovered with respect to differences in QOA trajectories among those with high and low initial QOA levels, suggesting that both groups showed a pattern of decrease in QOA, but girls who started with higher initial QOA levels demonstrated a slightly faster rate of change over time in QOA as compared to those who started at lower initial QOA levels.

Influence of Change in QOA on Symptom Outcomes

The intercept of QOA trajectories was not significantly related to child-reported CD or depression symptom severity at wave 10, indicating that initial QOA levels in early adolescence did not predict higher symptom severity in mid- to late-adolescence after controlling for the influence of baseline symptoms and QOA slope factors. However, slope 1 was negatively related to CD and depression symptom severity outcomes, indicating that steeper decreases in QOA from 11–14 predicted higher CD and depression severity in mid-adolescence after controlling for baseline symptoms. There were no significant effects of changes in QOA from ages 14–16 (slope 2) on symptom severity outcomes. There were also some direct effects of baseline covariates on symptom severity outcomes after controlling for the influence of QOA growth parameters. Specifically, greater harsh punishment and child CD severity at baseline were significant direct predictors of higher CD symptom severity at wave 10. Only baseline depression severity predicted higher depression symptom severity at wave 10 after controlling for QOA growth factors and other baseline covariates.

Indirect Effects of Baseline Parenting on Symptom Outcomes via Changes in QOA

We next determined the indirect effects of baseline covariates on wave 10 symptom severity via their effects on initial levels and trajectories of QOA. Only statistically significant indirect effects ($ps<.05$) are reported (Table 3). There were significant indirect effects of single parent status, parental involvement, and harsh punishment on both CD and depression symptom severity outcomes via the QOA slope factor from ages 11–14. Specifically, harsh punishment and single parent status predicted steeper decreases in QOA in early adolescence, which in turn, predicted greater CD and depression severity at wave 10. Greater parental involvement at baseline predicted a slower rate of decrease in QOA from ages 11–14, which in turn, predicted lower CD and depression severity at wave 10. There was also a significant indirect effect of baseline child depression severity on both CD and depression outcomes via their effects on QOA slope 1, indicating that higher initial levels of depression predicted steeper decreases in QOA from ages 11–14, which in turn, predicted higher CD and depression symptom severity at Wave 10.

Discussion

We examined trajectories, predictors, and consequences of individual-level changes in a central aspect of adolescents' perceived QOA to their primary caregiver across ages 11–16 in a high-risk sample of girls. As hypothesized, we found that girls' QOA shows a pattern of rapid linear decline during early adolescence (ages 11–14) followed by a plateau in mid-adolescence (ages 14–16). Also consistent with our hypotheses, harsh punishment and low parental involvement as well as child CD and depression symptoms in early adolescence were associated with lower initial levels of QOA. Single parent status, harsh punishment, low parental involvement, and child-reported depression in early adolescence predicted steeper decreases in QOA from ages 11–14, which in turn predicted greater CD and depression symptoms in later adolescence. Decreases in QOA in early adolescence fully mediated the effects of baseline single parent status, harsh punishment, and low parental involvement on depression severity at wave 10. Further, decreases in QOA from ages 11–14 fully mediated the effects of baseline single parent status, low parental involvement, and child depression symptoms, and partially mediated the effect of baseline harsh punishment, on CD symptom severity at wave 10. Hence, a faster rate of decrease in QOA from ages 11–14 appears to mediate the influence of several early parent and child risk factors on adolescent psychopathology outcomes.

This is the first prospective study to demonstrate two distinct phases of change in perceived QOA to caregivers among an at-risk sample of adolescent girls. These results are consistent with previous studies suggesting that QOA is malleable across developmental phases, especially in high-risk samples (Beijersbergen et al., 2012; Lewis, Feiring, & Rosenthal, 2000; Weinfield et al., 2000, 2004), with particularly marked decreases in self-reported QOA to a specific caregiver during early adolescence (Buist et al., 2002). The results of the unconditional model suggest that decreases in adolescents' self-reported QOA to a specific attachment figure may show a normative pattern of decline during early adolescence. It is possible that this decline results from increased emotional distance from and conflict with parents associated with pubertal development, particularly for girls and their mothers (Paikoff & Brooks-Gunn, 1991; Steinberg, 1987). Thus, the observed patterns of change may be more related to puberty than age per se, although this possibility should be explored further in future studies.

Our finding that girls' QOA did not change significantly during later adolescence differs from one study in which girls' QOA to their mothers decreased in a linear pattern across ages 11–17 (Buist et al., 2002). The divergent findings may be due to differences in sample characteristics (e.g., high-risk versus low-risk) and differences in the measurement of QOA. There is evidence that adolescents in low-risk, middle-income samples are afforded a longer adolescence, often extending into the early twenties (Johnson, Crosnoe, & Elder, 2011). Because economic and cultural backgrounds influence the rates of maturation and developmental expectations, we might expect different trajectories of change in QOA between high- and low-risk samples.

In addition to testing developmental norms for QOA, the present findings also inform our understanding of the predictors and consequences of varying rates of decline of QOA. Results indicate that social-environmental risk factors predict *steeper rates of decrease* in QOA during early adolescence, which in turn predict maladjustment in later adolescence. These results are consistent with studies suggesting that, in accordance with attachment theory (Bowlby, 1979), attachment shows a pattern of *lawful discontinuity*; i.e., changes in QOA across developmental periods tend to follow predictably from relationally salient stressors, particularly with caregivers (Hamilton, 2000; Waters et al., 2000). The effects of rates of change in QOA on symptom outcomes are consistent with studies suggesting that

QOA to caregivers serves as a protective factor against the development of behavioral and emotional problems (e.g., Allen & Manning, 2007; Scharf & Mayseless, 2007; Shumaker, Deutsch, & Brenninkmeyer, 2009). This is the only study to our knowledge that has demonstrated that *rate of change* in adolescents' perceived QOA to caregivers serves as a mediator between early adolescent social-environmental factors and later psychopathology symptoms in at-risk adolescent girls, underscoring the importance of QOA as a potential buffer against the development of psychopathology in adolescence.

Additionally, this study extends previous findings by demonstrating that harsh punishment, low parental involvement, and single parent status increase risk for steeper decreases in QOA specifically during early adolescence, even after accounting for child psychopathology symptoms and sociodemographic risk factors. Harsh punishment and low parental involvement may interfere with adolescents' perceptions of their caregiver as a safe and consistently available source of comfort during adolescence, which may interrupt their use of the caregiver as a "secure base" from which to explore new social relationships and as a "safe haven" in times of distress. Further, single parents may be less available to adolescents due to work and other responsibilities. These parenting-related risk factors may be stable characteristics of the caregiving environment, but they might affect QOA more during this period due to characteristics of the developmental stage of adolescence. Future studies might examine whether stable characteristics of the caregiving environment might affect the course of QOA differently during distinct developmental phases.

Child depression and CD symptoms at baseline also emerged as predictors of lower initial levels and trajectories of change in QOA during early adolescence. Depression symptoms predicted steeper decreases in QOA, which in turn predicted greater depression and CD symptoms in later adolescence. This finding suggests that a steeper rate of decrease in QOA during early adolescence might be an important mechanism by which depression symptoms are maintained and by which CD symptoms develop in girls during later adolescence. Depression symptoms may influence QOA via both child- and parent-driven effects and transactional processes that occur in parent-adolescent relationships. Depression may generate negative views of self and others (Nolen-Hoeksema, 1991), which could make girls less likely to perceive their caregivers as supportive and to seek out their support. Such dynamics in adolescent girls may evoke feelings of rejection or confusion in some caregivers, thereby leading to distancing behaviors from parents. This transactional process may contribute to more abrupt and rapid decreases in QOA than would be expected with normative changes in parent-adolescent relationships, which in turn may increase adolescents' likelihood of continued depressive symptoms and the emergence of behavioral problems in later adolescence.

Paradoxically, child CD symptoms at baseline predicted a slower rate of change in QOA during early adolescence, and higher initial QOA levels were associated with steeper rates of decrease in QOA. However, our examination of subgroup trajectories suggested that these effects could be due an intercept-slope interaction and floor effect, such that girls with high baseline CD symptoms and lower initial QOA levels had a more limited range for decreases in QOA in comparison to those without CD symptoms and higher initial QOA levels. Although we controlled for the influence of initial levels of QOA (intercepts) on trajectories of change in QOA by regressing the slopes on the QOA intercept, this only partially controls for the influence of a potential floor effect that occurs when the predictor (baseline CD symptoms) is strongly correlated with initial levels of a developmental construct (QOA), especially when initial levels of that construct also influence rates of growth.

The primary strength of the current study is the use of prospectively gathered data from both parent and child perspectives in a large and diverse community sample. However, due to

necessary limits on the total item pool in a large-scale prospective study, only one subscale of the IPPA-R was administered. In addition, one subscale item was omitted and items were scored on a different scale from the original instrument. Research has shown the Trust subscale is highly correlated with the IPPA-R overall attachment scale, though caution should be used when comparing these results to previous studies using the full IPPA-R. Further, the exclusive use of adolescent self-reports of QOA limits the scope of our assessment to only the cognitive/affective aspects of attachment. Moreover, our measure is limited to adolescents' perceived trust with respect to a specific caregiver, and does not capture generalized security with respect to attachment or distinct attachment styles. Finally, these findings may not generalize to low-risk or male samples.

Despite these limitations, these results extend knowledge of the developmental course of adolescent girls' QOA, and may have important prevention and treatment implications. Our findings suggest that early adolescence is a period of rapid change in girls' perceived QOA to caregivers, but QOA appears to remain relatively stable during mid-adolescence. Although decreases in perceived QOA to caregivers might be normative in early adolescence, a steeper rate of change in this period appears to increase risk for adolescent psychopathology. Thus, to identify adolescents at risk, it may be important to obtain multiple assessments of QOA and characterize trajectories of change over time. Findings also suggest that adolescent girls from single parent households, with more depression symptoms, and with parents who are less involved and use more harsh punishment may be at higher risk for steeper decreases in QOA and subsequent increases in psychopathology symptoms during adolescence. Such factors may be used to identify girls at higher risk, and interventions could be tailored to foster more parental involvement and less harsh punishment to potentially improve parent-adolescent relationships and reduce risk for the development of both internalizing and externalizing symptoms in girls.

Acknowledgments

This research was supported by grants from the National Institute of Mental Health (MH056630), the National Institute on Drug Abuse (DA012237), and by funding from the Office of Juvenile Justice and Delinquency Prevention, the FISA Foundation and the Falk Fund. Dr. Scott's and Dr. Zalewski's efforts were supported by T32 MH018269. Dr. Stepp's effort was supported by K01 MH086713. Ms. Whalen's effort was supported by F31 MH093991.

References

- Aikins JW, Howes C, Hamilton C. Attachment stability and the emergence of unresolved representations during adolescence. *Attachment & Human Development*. 2009; 11(5):491–512.10.1080/14616730903017019 [PubMed: 19946807]
- Allen, JP.; Land, D. Attachment in adolescence. 2. New York, NY: Guilford Press; 1999.
- Allen JP, Manning N. From safety to affect regulation: Attachment from the vantage point of adolescence. *New Directions for Child and Adolescent Development*. 2007; 117:23–39.10.1002/cd.192 [PubMed: 17876787]
- Allen JP, Marsh P, McFarland C, McElhaney KB, Land DJ, Jodl KM, Peck S. Attachment and autonomy as predictors of the development of social skills and delinquency during midadolescence. *Journal of Consulting and Clinical Psychology*. 2002; 70(1):56–66.10.1037/0022-006X.70.1.56 [PubMed: 11860056]
- Allen JP, McElhaney KB, Kuperminc GP, Jodl KM. Stability and change in attachment security across adolescence. *Child Development*. 2004; 75(6):1792–1805.10.1111/j.1467-8624.2004.00817.x [PubMed: 15566380]
- Allen JP, Porter M, McFarland C, McElhaney KB, Marsh P. The relation of attachment security to adolescents' paternal and peer relationships, depression, and externalizing behavior. *Child Development*. 2007; 78(4):1222–1239.10.1111/j.1467-8624.2007.01062.x [PubMed: 17650135]

- American Psychiatric Association. Diagnostic and statistical manual of mental disorders (DSM-IV). Washington, DC: American Psychiatric Publishing, Inc.; 1994.
- Ammaniti M, van IJzendoorn MH, Speranza AM, Tambelli R. Internal working models of attachment during late childhood and early adolescence: An exploration of stability and change. *Attachment and Human Development*. 2000; 2(3):328–346.10.1080/14616730010001587 [PubMed: 11708222]
- Armsden GC, Greenberg MT. The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *Journal of Youth and Adolescence*. 1987; 16(5):427–454.
- Beijersbergen MD, Juffer F, Bakermans-Kranenburg MJ, van IJzendoorn MH. Remaining or becoming secure: Parental sensitive support predicts attachment continuity from infancy to adolescence in a longitudinal adoption study. *Developmental Psychology*. 2012; 48(5):1277–1282.10.1037/a0027442 [PubMed: 22369333]
- Belsky J. The development of human reproductive strategies: Progress and prospects. *Current Directions in Psychological Science*. 2012; 21(5):310–316.10.1177/0963721412453588
- Bosmans G, Braet C, Beyers W, Van Leeuwen K, Van Vlierberghe L. Parents' power assertive discipline and internalizing problems in adolescents: The role of attachment. *Parenting: Science and Practice*. 2011; 11(1):34–55.
- Bosmans G, Braet C, Leeuwen K, Beyers W. Do parenting behaviors predict externalizing behavior in adolescence, or is attachment the neglected 3rd factor? *Journal of Youth and Adolescence*. 2006; 35(3):354–364.10.1007/s10964-005-9026-1
- Bowlby, J. The making and breaking of affectional bonds. London: Tavistock Publications; 1979.
- Bowlby, J. A secure base: Parent-child attachment and healthy human development. New York: Basic Books; 1988.
- Boyce WT, Ellis BJ. Biological sensitivity to context: I. An evolutionary– developmental theory of the origins and functions of stress reactivity. *Development and Psychopathology*. 2005; 17(02):271–301.10.1017/S0954579405050145 [PubMed: 16761546]
- Brumariu LE, Kerns KA. Parent–child attachment and internalizing symptoms in childhood and adolescence: A review of empirical findings and future directions. *Development and Psychopathology*. 2010; 22:177–203.10.1017/S0954579409990344 [PubMed: 20102655]
- Buist KL, Dekovi M, Meeus W, van Aken MAG. Developmental patterns in adolescent attachment to mother, father and sibling. *Journal of Youth and Adolescence*. 2002; 31(3):167–176.10.1023/A:1015074701280
- Buist KL, Dekovi M, Meeus W, van Aken MAG. The reciprocal relationship between early adolescent attachment and internalizing and externalizing problem behaviour. *Journal of Adolescence*. 2004; 27(3):251–266.10.1016/j.adolescence.2003.11.012 [PubMed: 15159087]
- Buist KL, Reitz E, Dekovi M. Attachment stability and change during adolescence: A longitudinal application of the Social Relations Model. *Journal of Social and Personal Relationships*. 2008; 25(3):429–444.10.1177/0265407508090867
- Burge D, Hammen C, Davila J, Daley SE, Paley B, Lindberg N, Rudolph KD. The relationship between attachment cognitions and psychological adjustment in late adolescent women. *Development and Psychopathology*. 1997; 9(01):151–167. [PubMed: 9089129]
- Carlivati J, Collins WA. Adolescent attachment representations and development in a risk sample. *New Directions for Child and Adolescent Development*. 2007; 2007(117):91–106.10.1002/cd.196 [PubMed: 17876789]
- Crawford TN, Cohen P, Midlarsky E, Brook JS. Internalizing symptoms in adolescents: Gender differences in vulnerability to parental distress and discord. *Journal of Research on Adolescence*. 2001; 11(1):95–118.10.1111/1532-7795.00005
- Curran PJ, Bauer DJ, Willoughby MT. Testing main effects and interactions in latent curve analysis. *Psychological Methods*. 2004; 9(2):220–237. [PubMed: 15137890]
- Del Giudice M. Sex, attachment, and the development of reproductive strategies. *Behavioral and Brain Sciences*. 2009; 32(01):1–21. [PubMed: 19210806]
- Doyle AB, Markiewicz D. Parenting, marital conflict and adjustment from early- to mid-adolescence: Mediated by adolescent attachment style? *Journal of Youth and Adolescence*. 2005; 34(2):97–110.10.1007/s10964-005-3209-7

- Doyle AB, Lawford H, Markiewicz D. Attachment style with mother, father, best friend, and romantic partner during adolescence. *Journal of Research on Adolescence*. 2009; 19(4):690–714.
- Duncan, TE.; Duncan, SC.; Strycker, LA. An introduction to latent variable growth curve modeling: Concepts, issues, and applications. Mahwah, NJ: Lawrence Erlbaum; 2006.
- Elder, GH.; Johnson, MK.; Crosnoe, R. The emergence and development of life course theory. In: Mortimer, JT.; Shanahan, MJ., editors. *Handbook of the life course*. New York: Kluwer Academic/Plenum; 2003. p. 3-19.
- Ellis BJ, Shirtcliff EA, Boyce WT, Deardorff J, Essex MJ. Quality of early family relationships and the timing and tempo of puberty: Effects depend on biological sensitivity to context. *Development and Psychopathology*. 2011; 23(01):85–99.10.1017/S0954579410000660 [PubMed: 21262041]
- Gadow, KD.; Sprafkin, J. *Adolescent Symptoms Inventory-4: Screening Manual*. Stony Brook, NY: Checkmate Plus; 1997a.
- Gadow, KD.; Sprafkin, J. *Child Symptom Inventory-4: Screening Manual*. Stony Brook, NY: Checkmate Plus; 1997b.
- Gallarin M, Alonso-Arbiol I. Parenting practices, parental attachment and aggressiveness in adolescence: A predictive model. *Journal of Adolescence*. 201210.1016/j.adolescence.2012.07.002
- Greenfield, Emily A.; Marks, Nadine F. Linked lives: Adult children's problems and their parents' psychological and relational well-being. *Journal of Marriage and Family*. 2006; 68(2):442–454.10.1111/j.1741-3737.2006.00263.x [PubMed: 17710218]
- Gullone E, Robinson K. The Inventory of Parent and Peer Attachment—Revised (IPPA-R) for children: A psychometric investigation. *Clinical Psychology & Psychotherapy*. 2005; 12(1):67–79.
- Hamilton CE. Continuity and discontinuity of attachment from infancy through adolescence. *Child Development*. 2000; 71(3):690–694. [PubMed: 10953935]
- Hankin B. Childhood maltreatment and psychopathology: Prospective tests of attachment, cognitive vulnerability, and stress as mediating processes. *Cognitive Therapy and Research*. 2005; 29(6):645–671.10.1007/s10608-005-9631-z
- Higgins GE, Jennings WG, Mahoney M. Developmental trajectories of maternal and paternal attachment and delinquency in adolescence. *Deviant Behavior*. 2010; 31(7):655–677.10.1080/01639620903415851
- Hipwell AE, Loeber R, Stouthamer-Loeber M, Keenan K, White HR, Kroneman L. Characteristics of girls with early onset disruptive and antisocial behaviour. *Criminal Behavior and Mental Health*. 2002; 12(1):99–118.
- Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*. 1999; 6(1):1–55.10.1080/10705519909540118
- Johnson MK, Crosnoe R, Elder GH Jr. Insights on adolescence from a life course perspective. *Journal of Research on Adolescence*. 2011; 21(1):273–280. [PubMed: 21483644]
- Laible D. Attachment with parents and peers in late adolescence: Links with emotional competence and social behavior. *Personality and Individual Differences*. 2007; 43(5):1185–1197.10.1016/j.paid.2007.03.010
- Laible DJ, Carlo G, Raffaelli M. The differential relations of parent and peer attachment to adolescent adjustment. *Journal of Youth and Adolescence*. 2000; 29(1):45–59.10.1023/A:1005169004882
- Lewis M, Feiring C, Rosenthal S. Attachment over time. *Child Development*. 2000; 71(3):707–720.10.1111/1467-8624.00180 [PubMed: 10953938]
- Llabre MM, Spitzer SB, Saab PG, Schneiderman N. Piecewise latent growth curve modeling of systolic blood pressure reactivity and recovery from the cold pressor test. *Psychophysiology*. 2001; 38(6):951–960. [PubMed: 12240671]
- Loeber, R.; Farrington, DP.; Stouthamer-Loeber, M.; Van Kammen, WB. *Antisocial behavior and mental health problems: Explanatory factors in childhood and adolescence*. Mahwah, NJ: Lawrence Erlbaum; 1998.
- MacKinnon, DP. *Introduction to statistical mediation analysis*. New York: Lawrence Erlbaum Associates Taylor and Francis Group; 2008.
- McDonald RP, Ho MR. Principles and practice in reporting structural equation analyses. *Psychological Methods*. 2002; 7(1):64–82.10.1037/1082-989X.7.1.64 [PubMed: 11928891]

- Mikulincer M, Florian V, Cowan PA, Cowan C. Attachment security in couple relationships: A systemic model and its implications for family dynamics. *Family Process*. 2002; 41(3):405–434. [PubMed: 12395567]
- Muris P, Meesters C, van Melick M, Zwambag L. Self-reported attachment style, attachment quality, and symptoms of anxiety and depression in young adolescents. *Personality and Individual Differences*. 2001; 30(5):809–818.
- Muthén, BO.; Muthén, LK. Mplus user's guide. 6. Los Angeles, CA: Muthén & Muthén; 2010.
- Nickerson AB, Nagle RJ. Parent and peer attachment in late childhood and early adolescence. *Journal of Early Adolescence*. 2005; 25(2):223–249.10.1177/0272431604274174
- Nolen-Hoeksema S. Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology*. 1991; 100(4):569. [PubMed: 1757671]
- Paikoff RL, Brooks-Gunn J. Do parent-child relationships change during puberty? *Psychological Bulletin*. 1991; 110(1):47. [PubMed: 1891518]
- Ryff, CD.; Seltzer, MM. The parental experience in midlife. Chicago: University of Chicago Press; 1997.
- Scharf M, Mayseless O. Putting eggs in more than one basket: A new look at developmental processes of attachment in adolescence. *New Directions for Child and Adolescent Development*. 2007; 117:1–22.10.1002/cd.191 [PubMed: 17876784]
- Seiffge-Krenke I, Stemmler M. Factors contributing to gender differences in depressive symptoms: A test of three developmental models. *Journal of Youth and Adolescence*. 2002; 31(6):405–417.10.1023/A:1020269918957
- Shumaker DM, Deutsch RM, Brenninkmeyer L. How do I connect? Attachment issues in adolescence. *Journal of Child Custody*. 2009; 6(1–2):91–112.10.1080/15379410902894866
- Sroufe LA. Attachment and development: A prospective, longitudinal study from birth to adulthood. *Attachment & Human Development*. 2005; 7(4):349–367.10.1080/14616730500365928 [PubMed: 16332580]
- Steinberg L. Impact of puberty on family relations: Effects of pubertal status and pubertal timing. *Developmental Psychology*. 1987; 23(3):451.
- Steinberg L. We know some things: Parent–adolescent relationships in retrospect and prospect. *Journal of Research on Adolescence*. 2001; 11(1):1–19.
- Sternberg KJ, Lamb ME, Guterman E, Abbott CB, Dawud-Noursi S. Adolescents' perceptions of attachments to their mothers and fathers in families with histories of domestic violence: A longitudinal perspective. *Child Abuse & Neglect*. 2005; 29(8):853–869. [PubMed: 16126269]
- Straus MA, Hamby SL, Finkelhor D, Moore DW, Runyan D. Identification of child maltreatment with the Parent-Child Conflict Tactics Scales: Development and psychometric data for a national sample of American parents. *Child Abuse & Neglect*. 1998; 22(4):249–270. [PubMed: 9589178]
- Van Ryzin MJ, Carlson EA, Sroufe LA. Attachment discontinuity in a high-risk sample. *Attachment & Human Development*. 2011; 13(4):381–401.10.1080/14616734.2011.584403 [PubMed: 21718224]
- Waters E, Merrick S, Treboux D, Crowell J, Albersheim L. Attachment security in infancy and early adulthood: A twenty-year longitudinal study. *Child Development*. 2000; 71(3):684–689.10.1111/1467-8624.00176 [PubMed: 10953934]
- Waters HS, Rodrigues LM, Ridgeway D. Cognitive underpinnings of narrative attachment assessment. *Journal of Experimental Child Psychology*. 1998; 71(3):211–234. [PubMed: 9878106]
- Weinfield NS, Sroufe LA, Egeland B. Attachment from infancy to early adulthood in a high-risk sample: Continuity, discontinuity, and their correlates. *Child Development*. 2000; 71(3):695–702.10.1111/1467-8624.00178 [PubMed: 10953936]
- Weinfield NS, Whaley GJ, Egeland B. Continuity, discontinuity, and coherence in attachment from infancy to late adolescence: Sequelae of organization and disorganization. *Attachment & Human Development*. 2004; 6(1):73–97.10.1080/14616730310001659566 [PubMed: 14982680]
- Zimmermann P, Becker-Stoll F. Stability of attachment representations during adolescence: The influence of ego-identity status. *Journal of Adolescence*. 2002; 25(1):107–124.10.1006/jado.2001.0452 [PubMed: 12009753]

Table 1
Descriptive Statistics and Correlations for All Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Quality of Attachment (Waves 6–9 for Cohorts 6, 7, and 8; Waves 7–9 for Cohort 5)															
1. Age 11	1														
2. Age 12	.58	1													
3. Age 13	.52	.59	1												
4. Age 14	.44	.51	.61	1											
5. Age 15	–	.48	.53	.68	1										
6. Age 16	–	–	.45	.57	.64	1									
Baseline Covariates (Wave 6 for Cohorts 6, 7, and 8; Wave 7 for Cohort 5)															
7. Minority Race	–.10	–.06	–.06	–.08	–.09	–.06	1								
8. Family Poverty	–.04	–.05	–.00	–.03	–.08	–.05	.36	1							
9. Single Parent	–.12	–.10	–.10	–.12	–.12	–.09	.37	.26	1						
10. Harsh Punishment	–.16	–.16	–.15	–.16	–.17	–.16	.27	.18	.18	1					
11. Parental Involvement	.10	.14	.15	.16	.18	.16	.00	–.06	–.01	–.18	1				
12. Baseline CD	–.23	–.19	–.20	–.12	–.15	–.20	.16	.12	.13	.17	–.09	1			
13. Baseline Depression	–.29	–.25	–.26	–.23	–.25	–.22	.14	.09	.10	.11	–.05	.36	1		
Symptom Outcomes (Wave 10 for all cohorts)															
14. Wave 10 CD	–.13	–.20	–.21	–.24	–.19	–.27	.11	.11	.11	.18	–.05	.28	.18	1	
15. Wave 10 Depression	–.12	–.19	–.21	–.25	–.25	–.27	.06	.04	.07	.07	–.03	.17	.34	.30	1
<i>N</i>	1023	1535	2033	1523	990	493	2098	2074	2070	2075	2076	2073	2071	1916	1915
Mean/Proportion	25.55	25.16	24.54	23.74	23.65	23.78	0.59	0.37	0.42	9.05	9.68	0.93	7.22	1.25	6.43
<i>SD</i>	2.33	2.91	3.20	3.68	3.82	3.57	0.49	0.48	0.49	2.04	2.24	1.65	4.50	2.09	4.79

Notes. CD = conduct disorder; *p* .05 for *rs* |.05|.

Table 2
Standardized Coefficients for the Full Conditional Piecewise Latent Growth Curve Model

	<u>QOA Intercept</u>		<u>QOA Slope 1 (ages 11–14)</u>		<u>QOA Slope 2 (ages 14–16)</u>		<u>Wave 10 Conduct Disorder</u>		<u>Wave 10 Depression</u>	
	<i>SE</i>		<i>SE</i>		<i>SE</i>		<i>SE</i>		<i>SE</i>	
Baseline Covariates										
Minority Race	<.005	(.03)	.01	(.04)	-.02	(.08)	.01	(.02)	<.005	(.03)
Single Parent	-.05	(.03)	-.08*	(.04)	-.03	(.07)	.02	(.02)	.01	(.03)
Family Poverty	.03	(.03)	.05	(.04)	-.11	(.08)	.05	(.03)	-.01	(.03)
Harsh Punishment	-.09**	(.03)	-.11**	(.04)	-.02	(.07)	.09***	(.03)	.00	(.03)
Parental Involvement	.12***	(.03)	.10**	(.04)	<.005	(.08)	.02	(.02)	.02	(.02)
Baseline CD	-.23***	(.04)	.09*	(.05)	-.18	(.09)	.24***	(.05)	.04	(.04)
Baseline Depression	-.28***	(.04)	-.09*	(.04)	-.06	(.09)	.04	(.03)	.29***	(.03)
QOA Growth Factors										
Intercept			-.19*	(.08)	-.47**	(.16)	-.11	(.06)	-.13	(.07)
Slope 1 (ages 11–14)							-.26***	(.04)	-.24***	(.04)
Slope 2 (ages 14–16)							-.08	(.10)	-.14	(.09)

Notes. QOA = quality of attachment. Baseline covariates were assessed at Wave 6 for Cohorts 6, 7, and 8, and at Wave 7 for Cohort 5.

* $p < .05$,

** $p < .01$,

*** $p < .001$.

Table 3
Indirect Effects of Baseline Covariates on Symptom Severity Outcomes via Change in Attachment

	Wave 10 Symptom Severity Outcomes			
	Conduct Disorder		Depression	
		<i>SE</i>		<i>SE</i>
Baseline Covariates via QOA Slope 1 (Ages 11 to 14)				
Single Parent	.02 *	(.01)	.02 *	(.01)
Harsh Punishment	.03 **	(.01)	.03 **	(.01)
Parental Involvement	-.03 **	(.01)	-.02 **	(.01)
Baseline Depression	.02 *	(.01)	.02 *	(.01)

Notes. QOA = quality of attachment. Baseline covariates were assessed at Wave 6 for Cohorts 6, 7, and 8, and at Wave 7 for Cohort 5. Standardized coefficients are presented. Only statistically significant ($p < .05$) indirect effects are shown; there were no significant indirect effects of baseline covariates on symptom severity outcomes via QOA intercept or Slope 2 (ages 14 to 16).

*
 $p < .05$,

**
 $p < .01$.