

Parent-child relationships of boys in different offending trajectories: a developmental perspective

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Background: This study tested the theoretical assumption that transformations of parent-child relationships in late childhood and adolescence would differ for boys following different offending trajectories. **Methods:** Using longitudinal multiinformant data of 503 boys (ages 7–19), we conducted Growth Mixture Modeling to extract offending trajectories. Developmental changes in child reports of parent-child joint activities and relationship quality were examined using Latent Growth Curves. **Results:** Five offending trajectories were found: non-offenders, moderate childhood offenders, adolescent-limited offenders, serious childhood offenders, and serious persistent offenders. Non-offenders reported high and stable levels of relationship quality between age 10 and 16. Adolescent-limited offenders reported a similarly high relationship quality as non-offenders at ages 7 and 10, but a lower and decreasing relationship quality in adolescence. Compared with non-offenders, serious persistent offenders reported poorer parent-child relationship quality at all ages, and a decreasing relationship quality in adolescence. Serious persistent offenders and adolescent-limited offenders reported similar levels and changes in parent-child relationship quality in adolescence. Although serious persistent offenders reported fewer joint activities at age 10 and 13 than non-offenders, a similar linear decrease in joint activities in early to middle adolescence was found for boys in each trajectory. **Conclusion:** Developmental changes in parent-child relationship quality differ for different types of offenders. This finding has scientific and practical implications. **Keywords:** Delinquency, offending trajectories, parent-child relationship, longitudinal, growth curve modeling.

Introduction

From diverse theoretical view points, problematic parent-child relationships have been linked to children's and adolescents' engagement in delinquency (Loeber & Dishion, 1983; Reid & Patterson, 1989; Stattin & Kerr, 2000). However, the changing nature and quality of these relationships from childhood into late adolescence, while well-documented in developmental research (Conger, Lorenz, & Wickrama, 2004), are yet to have been described for offenders. Consequently, suggestions by researchers (Moffitt, 1993; Patterson & Yoerger, 1997) that the nature and quality of parent-child relationships evolve differently for boys in different offending trajectories, and the potential implication that offenders could be differentiated on transformations in parent-child relationships, are yet to be empirically tested. The current study therefore aimed to unravel the unique developmental changes in parent-child relationships that boys in different offending trajectories experience.

Offending trajectories in boys

Moffitt (1993) emphasized that the average age-crime curve in boys' delinquency represents meaningful

individual differences in offending trajectories. She initially distinguished three trajectories between childhood and early adulthood. In addition to a group of children who do not engage in delinquency (i.e., non-offenders), an estimated one forth up to two thirds go through a smooth childhood, but temporarily engage in moderate levels of nonviolent delinquency during adolescence (i.e., adolescent-limited offenders), and about 5% engage in serious delinquency from childhood into early adulthood (i.e., serious persistent offenders; Moffitt, 1993; Moffitt & Caspi, 2001; Patterson & Yoerger, 1997). Several subsequent empirical studies have confirmed and extended upon this idea. For instance, a fourth trajectory can be found empirically, that is composed of children who engage in childhood conduct problems, but who recover in adolescent years (Lacourse, Nagin, Tremblay, Vitaro, & Claes, 2003; Moffitt, Caspi, Dickson, Silva, & Stanton, 1996). A review of 80 longitudinal studies using group-based modeling (Piquero, 2007), moreover, revealed a picture of three to six offense trajectories from childhood to late adolescence. Besides the theoretically assumed trajectories of adolescent-limited and life-course persistent offending, other offending trajectories were repeatedly found, such as late-onset persistent delinquency and moderate, but declining delinquency. Hence, empirical studies underscore the existence of different types of offenders, but also

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emphasize the fact that there is more variation in delinquency than is theoretically described to date.

Although adolescent-limited and serious persistent offenders are assumed to have their own etiologies, prognoses, and require tailored interventions (Moffitt, 1993; Moffitt et al., 1996), these offenders may be difficult to differentiate based on their levels of delinquency (Moffitt et al., 1996), which in turn presents a considerable challenge to scientists and to practitioners working with delinquent youths. One domain on base of which different types of delinquents can be possibly differentiated is the nature and quality of parent-child relationships. In particular, developmental changes in parent-child relationships from childhood to adolescence are assumed to vary for boys in different trajectories (e.g., Moffitt, 1993; Patterson & Yoerger, 1997), and studying transformations in parent-child relationships may thus offer unique and valuable insights into the differential etiology of different types of offenders.

Typically, however, scholars examining parent-child relationship transformations ignore the existence of offending trajectories and studies on delinquency development ignore transformations in parent-child relationships. Instead, a common approach is to examine parent-child relationship transformations among a general population, which ignores the fact that transformations may go differently depending on adolescent offending. Another common approach is to predict offending trajectory membership from childhood family variables, which provides little more than basic descriptive information on differences between offenders; however (Piquero, 2007), and ignores the potential differences in family processes of boys in different offending trajectories. Changes in the parent-child relationship from childhood into adolescence in children in different offending trajectories are, to the best of our knowledge, yet to be examined.

Parent-child relationship transformations

Relationship transformations in families of non-offenders are believed to be a relatively smooth process towards greater adolescent independence (Collins, 1990; Steinberg, 1990). As part of normal development among nonoffending children, hierarchical authoritarian parent-child relationships in childhood are gradually transformed into more egalitarian ones in late adolescence, to meet adolescents' increasing need for autonomy and independence. As children enter high school, the role and influence of the peer group increases, while the time children spend in joint activities, their parents' declines (Larson, Richards, Moneta, Holmbeck, & Duckett, 1996). Keeping track of adolescents' whereabouts and activities, thus, becomes a process in which parents have to rely on their adolescents' disclosures regarding their leisure time (Keijsers, Branje, Van der Valk, & Meeus, 2010; Keijsers & Laird, 2010;

Kerr & Stattin, 2000; Laird, Marrero, & Sentse, 2010; Marshall, Tilton-Weaver, & Bosdet, 2005; Racz & McMahon, 2011; Smetana, Metzger, Gettman, & Campione-Barr, 2006; Stattin & Kerr, 2000). Adolescent disclosure, in turn, may be facilitated by joint activities (Keijsers, Branje, Van der Valk et al., 2010; Willoughby & Hamza, 2010) and a good affective quality of the parent-child relationship (Keijsers, Branje, Frijns, Finkenauer, & Meeus, 2010; Keijsers, Frijns, Branje, & Meeus, 2009; Kerr, Stattin, & Trost, 1999).

As part of normative developmental changes, these two general aspects of parent-child relationships, joint activities, and the affective quality, are realigned. A decrease in joint activities is assumed to take place (Larson et al., 1996) under more or less stable levels of affection. For example, empirical studies on general populations show that the affective quality of the parent-child relationship is stable during adolescence (Loeber et al., 2000) or shows a small decline from early to middle adolescence (De Goede, Branje, & Meeus, 2009; Keijsers, Loeber, Branje, & Meeus, 2011; Shanahan, McHale, Crouter, & Osgood, 2007). That is, whereas parental involvement, in terms of joint activities, may decrease significantly, the affective quality of the relationship may be rather stable. Whether these normative relationship transformations from childhood into adolescence take place for non-offenders only, or also in families of offending boys is an unanswered question.

Parent-child relationship transformation for different types of offenders

Moreover, relationship transformations may evolve differently for boys in different offending trajectories. Adolescent-limited offenders are believed to have a history of warm and close relationships with their parents in childhood, however, problematic relationships with their parents during adolescent years (Moffitt, 1993; Patterson & Stouthamer-Loeber, 1984; Patterson & Yoerger, 1997; Stattin & Kerr, 2000). Their delinquency, emerging in adolescence, has been argued to reflect their needs to cut off childhood bonds to parents (e.g., Moffitt, 1993) and apparently this strategy is successful: Adolescent exhibiting moderate levels of delinquency spend less time than nondelinquent adolescents in joint activities with their parents and report the relationship to be of poorer quality (e.g., Keijsers, Branje, Van der Valk et al., 2010; Laird, Pettit, Bates, & Dodge, 2003). In summary, theory and findings suggest that the initially high-quality parent-child relationship of adolescent-limited offenders deteriorates rapidly in adolescence. To the best of our knowledge, this study is the first to examine these changes unique to adolescent-limited offenders.

For children exhibiting persistent conduct problems with an early-onset, parent-child relationships may again develop in a different fashion. It is likely

that the boys' previous behavioral problems, as well as earlier disrupted family processes, result in relatively problematic transformations in parent-child relationships during adolescence. Empirical studies show, for instance, that parental involvement decreases more rapidly for children with early deviant behavior than is normative (e.g., Patterson, Bank, & Stoolmiller, 1990; Pettit, Keiley, Laird, Bates, & Dodge, 2007). How serious persistent offenders and their parents realign the parent-child relationship from childhood into late adolescence has never been described however. Knowledge is even more sparse with regard to offender trajectories that have only recently been described in the literature, such as boys with high levels of childhood deviance that desists after the childhood years (Moffitt et al., 1996; Piquero, 2007). This study aimed to answer this question.

The present study

In summary, the theoretically anticipated differential development of parent-child relationships in families of children who follow different trajectories in delinquency is a neglected field of study. It remains therefore unknown how normative transformational processes in parent-child relationships of non-offenders compare to processes in families of different offender subtypes, and to what extent adolescent-limited offenders differ from serious persistent offenders. This study addressed two research questions and related hypotheses to examine this issue.

First, we examined how many developmental offending trajectories can be distinguished from age 7 to 19. We hypothesized that we would find non-delinquents, children with temporarily moderate delinquency in adolescence (i.e., adolescent-limited offenders), and children with an early onset of serious and persistent delinquency. In addition, we expected one or more empirically based trajectories, such as children with heightened levels of delinquency in childhood only.

Second, this study examined how the nature and quality of parent-child relationships develop between ages 7 and 16 for boys in different offending trajectories. Therefore, we compared offending groups on mean levels (at age 7, age 10, age 13, and age 16) and developmental changes (from age 7 to 10, from 10 to 13, and from 13 to 16) of these relationship aspects. For *non-delinquents*, we expected a consistently high-quality parent-child relationship and high, but slightly decreasing joint activities during early adolescence. *Adolescent-limited delinquents* were hypothesized to have equivalent parent-child interactions as non-delinquents in childhood; however, a stronger decline in joint activities and relationship quality in early adolescence. For *serious persistent offenders*, we expected to find an increasingly poor quality of parent-child relationship and low levels of and strongly decreasing joint activities during early adolescence. We did not construct *a priori* hypotheses for boys in other offending trajectories.

Methods

Sample and procedure

This study used data from the Pittsburgh Youth Study, a large longitudinal study on inner-city boys, in which three cohorts of boys in grade 1, 4, and 7 were screened on antisocial behavior. Based on a composite score of parental, teacher, and participant information, the 30% most antisocial boys were identified as high-risk and the remainder as lower risk. Per cohort, about 250 high-risk boys and 250 lower risk boys were randomly selected for participation (for a detailed description of this procedure: Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1998).

After written informed consent was obtained from the participants and their legal guardians, data collection took place by interviewing primary caretakers, boys, and teachers. The first eight follow-ups were conducted half-yearly, and the subsequent nine assessments were conducted with an annual time interval. For the purpose of consistency, half-yearly waves were merged into yearly scores in this study, leading to thirteen annual waves of delinquency (age 7–19) and 10 annual waves of child-reported parent-child relationship measures (age 7–16). The cooperation rate throughout the study was high (average 82.3%; and 83.2% on the final assessment; Loeber et al., 2002).

The current study is based on data of the youngest cohort ($n = 503$; 256 high-risk and 247 lower risk). At the first follow-up, 4 months after the screening, the average age of participants was 6.9 years. Just over half of this sample was African-American (57.8%), and the remainder was Caucasian. The primary caretaker, the persons who claimed to have main responsibility for the boy, was almost exclusively female (96.8%; of which 92.2% was the biological mother). Demographics of this sample were representative for the school sample from which it was drawn (Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1998).

Measures

The *General Delinquency Seriousness Classification* (Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1998), based on combined reports of the parents (Child Behavior Check List, CBCL, Lifetime scale), the teacher (Teacher Rating Form; TRF), and the child (Self-Reported Antisocial behavior scale, SRA, or Self-Reported Delinquency scale, SRD), was used to classify delinquent behaviors: Level 0 represented absence of delinquency; level 1 consisted of minor delinquency at home or outside home, such as minor vandalism, fire-setting with insignificant damage or shoplifting; level 2 was comprised of moderately serious delinquent acts, including pick pocketing and carrying weapons; level 3 represented serious delinquency, including murder, rape, and robbery; and two or more serious level 3 offenses were assessed as level 4. Boys were classified in the category matching the most serious delinquent act they had committed in the last year. Six-month waves were combined by placing the youth at the highest level attained across the two waves. One-year stability ranged between $r = .27$ and $r = .55$. Previous studies have shown that the psychometric properties and predictive validity

of this measure are adequate (Farrington, Loeber, Stouthamer-Loeber, Van Kammen, & Schmidt, 1996).

Parent-child relationship quality. Using the relationship with primary caretaker questionnaire (Stouthamer-Loeber, Loeber, Wei, Farrington, & Wikstrom, 2002), the affective quality of the parent-child relationship was assessed in terms of negative and positive aspects of the relationship. Boys filled in 13 items (e.g., 'How often have you liked being your mother's/father's child?'; see also Appendix 1). Answers were rated on a 3-point Likert scale: 1 = *Almost never*, 2 = *Sometimes*, and 3 = *Often*. Sum scores were used. Internal consistency of this scale ranged between $\alpha = .73$ and $\alpha = .87$ and 1-year stability ranged between $r = .46$ and $r = .61$. Previous studies have shown that this scale has adequate construct and convergent validity in the prediction of delinquency (e.g., Loeber, Farrington, Stouthamer-Loeber, Moffitt, & Caspi, 1998; Stouthamer-Loeber et al., 2002).

Joint activities. From the supervision/involvement questionnaire (Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1998), we extracted a four-item scale, assessing frequency of joint leisure activities of boys and their parents. Boys answered items, such as 'How often do you and your mom do things together at home?' (When fathers were the primary caretaker, boys' reports on fathers were included in the scale-score). Items were scored on a 3-point scale (1 = *Almost never* to 3 = *Often*), and were summed to create a scale-score. Cronbach α 's ranged between $\alpha = .63$ and $\alpha = .79$. Temporal stability ranged between $r = .34$ and $r = .54$.

Analyses

First, we aimed to find the optimal number of distinct developmental trajectories in boys' delinquency between ages 7 and 19. Using *Mplus* version 4.0 (Muthén & Muthén, Los Angeles, CA), delinquency was modeled as a function of initial levels (intercepts), rate of change (linear slopes) and nonlinear change (quadratic slopes). To take the nonnormal distribution of delinquency into account, we used Poisson modeling with Robust Maximum Likelihood estimation (Piquero, 2007). Although our seriousness classification is not strictly a count measure, one-sample Kolmogorov-Smirnov tests over all measurement waves confirmed that the Poisson distribution fitted our data adequately.) Cases with partially missing data were included in the analyses using Full Information Maximum Likelihood. We started with a model without variation around trajectories, as is a common approach in criminological research (Latent Class Growth Analysis; LCGA; Nagin, 2005). As the former model may be overly simplistic (for arguments: Piquero, 2007), we increased model complexity by allowing children in each trajectory to vary on initial levels or rate of change (Growth Mixture Modeling; GMM; Muthén & Muthén, 2000).

We ran these different model types while specifying one up to six trajectories, thereby aiming to find the best model in terms of type of modeling (GMM vs. LCGA) and in terms of number of trajectories. The optimal model has the lowest Bayesian Information Criterion (SSA-BIC) and adding an extra trajectory does not sig-

nificantly improve the model according to the Lo-Mendell-Rubin Likelihood Ratio Test (LMR-LRT). The accuracy of classification of individuals in latent groups was judged with Entropy.

Second, we examined and compared levels and developmental changes in parent-child relationships for boys in different offending trajectories. For that purpose, we used Latent Growth Curve Modeling on joint activities and on relationship quality (Duncan, Duncan, Strycker, Li, & Alpert, 1999), with grouping based on offending trajectories. To facilitate interpretation, we examined linear development for three time-periods separately (ages 7–10, ages 10–13, and ages 13–16). All model fits were adequate: Chi-square values ranged from 23.32 to 40.26 with $df = 25$, Tucker Lewis Indices (TLI) and Comparative Fit Indices (CFI) ranged from .95 to 1.00, and the Root Mean Square Error of Approximation (RMSEA) fell between .00 and .08. To test for the hypothesized group differences in the levels at ages 7, 10, 13, and 16, and changes in parent-child variables between age 7–10, 10–13, and 13–16, we created dummy variables, comparing non-delinquents to each of the other offending trajectories, and serious persistent offenders to adolescent-limited offenders.

Results

Distinct offending trajectories

To examine the number of offending trajectories between ages 7 and 19, we used three types of modeling: LCGA, GMM with variation around intercepts, and GMM with variation around linear slopes. A further GMM-model with variation around intercepts and linear slopes did not converge probably due to model complexity. We consistently found five developmental trajectories to be optimal. Out of the three 5-trajectory models, there was strong evidence that GMM with variation around linear slopes had the best fit: The BIC value was nine points lower than the LCGA-model, and seven points lower than the model with variance around the intercepts. Moreover, stringent LMR-LRTs confirmed that five trajectories were preferred over four trajectories; however, six trajectories were not preferred over five. Entropy of this model was .62, which is acceptable. Moreover, cross tabulation of individuals using LCGA and GMM with variance around linear slopes indicated substantial agreement between both classifications (contingency coefficient = .87, $p < .001$). Trajectories are visually presented in Figure 1. Model fit estimates of these analyses are available from the first author upon request.

The first trajectory (24%) consisted of boys with very low levels of delinquency throughout childhood and adolescence; hence, they were labeled *non-delinquents*. The second trajectory (29%) showed moderate levels of delinquency in childhood; however, low levels in adolescence, and was labeled *moderate childhood delinquents*. Boys in the third trajectory (9%) had relatively low levels of delinquency in childhood, but moderate levels in

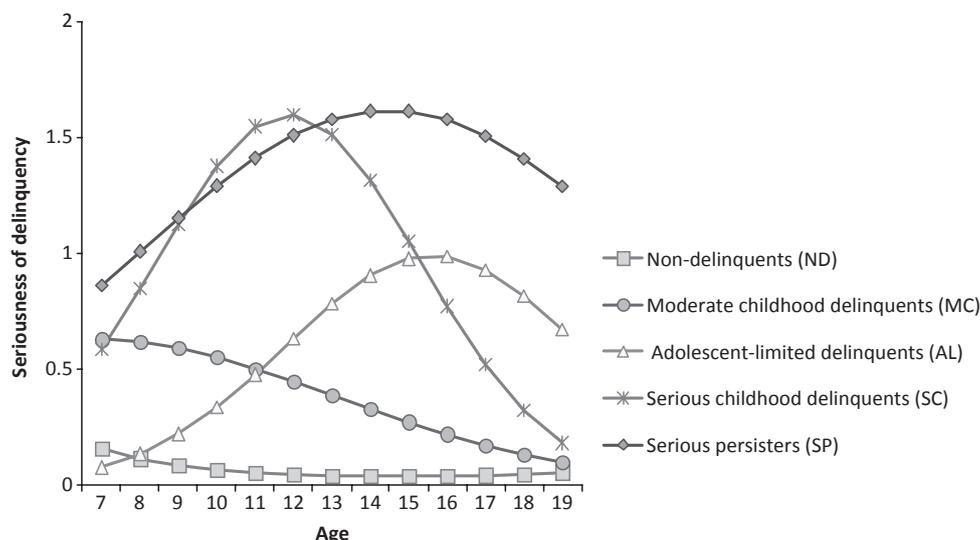


Figure 1 Five trajectories of seriousness of boy's delinquency from childhood into late adolescence

adolescence, with a peak around age 16. Although we could not define whether these youths actually desist after adolescence, this trajectory was named *adolescent-limited delinquents* to be consistent with the existing literature. The fourth trajectory (24%) was comprised of boys with high levels of childhood delinquency peaking at age 12, but moderately low levels of delinquency in adolescence. They were labeled *serious childhood delinquents*. Boys in the fifth trajectory (13%) displayed serious delinquency from childhood into late adolescence, with highest values around age 15 and were labeled *serious persistent delinquents*. Background characteristics of these trajectories are provided in Appendix 2.

Development of parent-child relationships for different offenders

To examine whether the development of the quality and nature of parent-child relationships from childhood into late adolescence would differ for boys

according to their offending trajectory, we examined levels and developmental changes in boys' reports of joint activities with their primary caretaker and the quality of this relationship.

Relationship quality. Offending groups differed in mean levels of relationship quality in childhood and adolescence (Table 1 and Figure 2). In childhood, non-delinquents and adolescent-limited delinquents did not differ, but boys in childhood delinquent trajectories scored poorer on relationship quality than non-delinquent boys. Group differences in childhood were small-to-medium-sized. At ages 13 and 16, boys in all offending trajectories, including adolescent-limited offenders scored the relationship to be of worse quality than nondelinquent boys. Scores on relationship quality at age 13 and at age 16 of adolescent-limited offenders and serious persistent offenders were not statistically different from one another. Medium-to-large group differences were found in adolescence.

Table 1 Development of quality of parent-child relationships for different offending trajectories

Estimates	Model 7–10		Model 10–13		Model 13–16		Level Age 16
	Level Age 7	Change Age 7–10	Level Age 10	Change Age 10–13	Level Age 13	Change Age 13–16	
Group							
ND	34.66***	0.47***	35.94***	-0.20	35.20***	-0.16	34.79***
MC	33.67***	0.21*	34.37***	-0.42***	33.12***	-0.10	33.08***
AL	34.71***	0.20	35.36***	-0.81***	32.44***	0.04	32.61***
SC	33.14***	0.25	33.96***	-0.89***	31.27***	0.17	31.94***
SP	33.36***	0.15	33.71***	-0.64***	31.28***	-0.12	31.05***
Group differences (Effect size)							
ND versus MC	-1.04 (0.32)**	-0.26	-1.49 (0.46)***	-0.25	-2.44 (0.77)***	0.09	-1.71 (0.48)***
ND versus AL	-0.05	-0.27	-0.37	-0.71**	-3.74 (1.18)***	0.32	-2.18 (0.61)**
ND versus SC	-1.50 (0.47)***	-0.13	-1.86 (0.57)***	-0.73***	-3.94 (1.24)***	0.31	-2.85 (0.80)***
ND versus SP	-1.23 (0.38)**	-0.30	-1.99 (0.61)***	-0.65**	-4.12 (1.29)***	0.16	-3.74 (1.05)***
AL versus SP	-1.24 (0.41)**	-0.14	-1.85 (0.72)***	0.23	-1.15	0.00	-1.56

Note. Example dummy coding: ND = 0 versus MC = 1. Effect sizes of significant effects are presented in Glass's Δ: .20 is small effect, .50 is medium effect, .80 is large effect. *p ≤ .05; **p ≤ .01; ***p ≤ .001

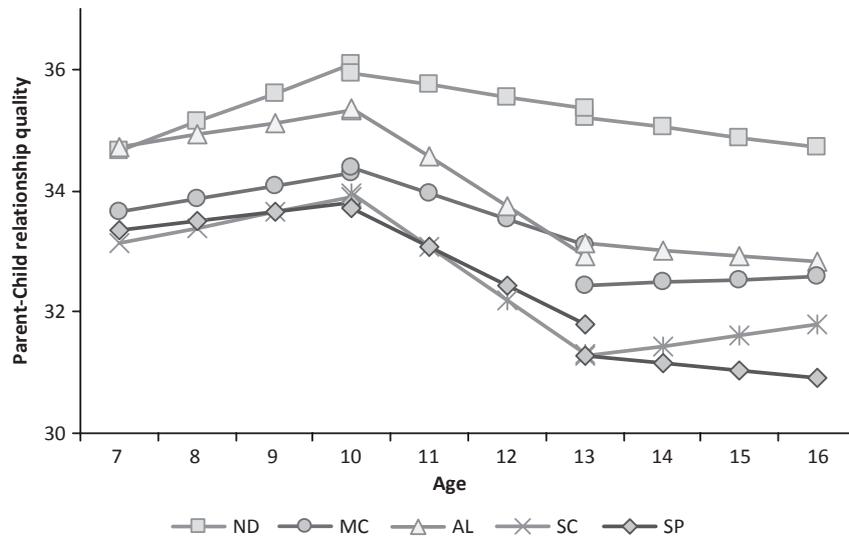


Figure 2 Development of parent-child relationship quality from childhood into adolescence for boys in five offending trajectories

In addition to these mean level differences, more pronounced developmental changes in relationship quality were found for offenders than for non-offenders. In childhood, parent-child relationship quality increased for non-delinquents and moderate childhood offenders, but not for any of the other groups. No significant differences in the rate of change were found between offending groups in this age period. Between age 10 and 13, distinct developmental changes for different offending groups were found: Whereas nondelinquent boys did not report significant changes in relationship quality with their parents, relationship quality decreased significantly for all offending groups. Moreover, in early adolescence, serious childhood offenders, serious persistent offenders, and adolescent-limited offenders all reported significantly stronger decreases in relationship quality than did non-delinquents. This decrease

in relationship quality between ages 10 and 13, however, was statistically equivalent for adolescent-limited and serious persistent offenders. Between ages 13 and 16, relationship quality was stable for both non-offenders and for all types of offenders, and none of the between-group contrasts in the rate of change were significant.

Joint activities. As indicated in Figure 3 and Table 2, boys in the two serious offending trajectories generally scored fewer joint activities with their mothers than the nonoffending boys: At ages 7, 10, 13, and 16 serious persistent offenders and/or serious childhood offenders reported fewer joint activities than non-delinquents. Effect sizes of significant differences were generally small-to-moderate. At ages 7 and 10, adolescent-limited offenders reported levels that were comparable to

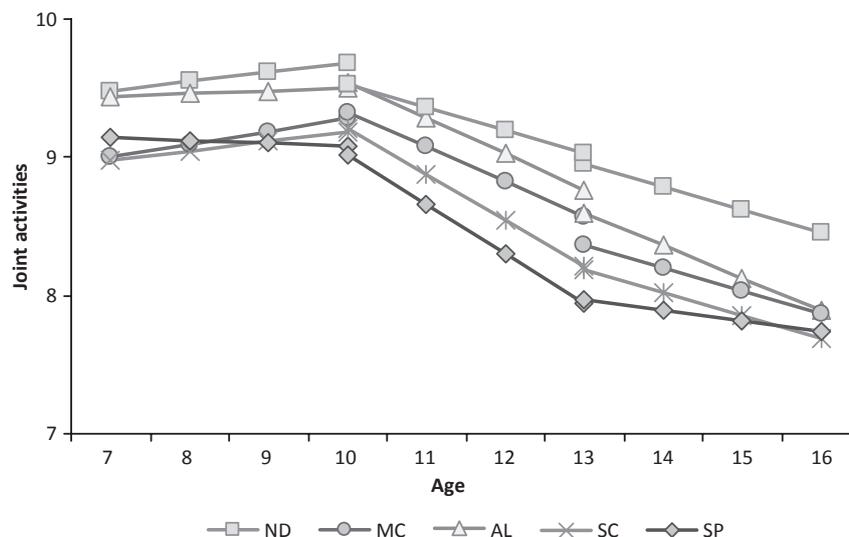


Figure 3 Development of joint activities between parents and children from childhood into adolescence for boys in five offending trajectories

Table 2. Development of joint activities for different offending trajectories

Estimates	Model 7–10		Model 10–13		Model 13–16		
	Level Age 7	Change Age 7–10	Level Age 10	Change Age 10–13	Level Age 13	Change Age 13–16	Level Age 16
Group							
ND	9.48***	0.07	9.53***	–0.17**	8.95***	–0.16**	8.44***
MC	9.01***	0.09	9.33***	–0.25***	8.59***	–0.17**	8.07***
AL	9.44***	0.02	9.54***	–0.26**	8.36***	–0.23*	8.00***
SC	8.98***	0.07	9.21***	–0.33***	8.19***	–0.17**	7.86***
SP	9.14***	–0.02	9.01***	–0.36***	7.97***	–0.08	7.96***
Group differences (Effect size)							
ND versus MC	–0.48 (0.34)**	0.03	–0.20	–0.08	–0.35	0.00	–0.37
ND versus AL	–0.07	–0.04	–0.01	–0.08	–0.58	–0.05	–0.44
ND versus SC	–0.50 (0.36)**	0.01	–0.34	–0.15*	–0.76 (0.41)***	0.00	–0.58 (0.36)*
ND versus SP	–0.34	–0.09	–0.52 (0.34)*	–0.20	–0.97 (0.52)***	0.10	–0.49
AL versus SP	–0.27	–0.06	–0.50	–0.10	–0.43	0.18	–0.04

Note. Example dummy coding: ND = 0 versus MC = 1. Effect sizes of significant effects are presented in Glass's Δ : .20 is small effect, .50 is medium effect, .80 is large effect.

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

non-delinquents; however, at ages 13 and 16 adolescent-limited offenders more closely resembled serious persistent offenders in terms of joint activities.

Despite these mean level differences, developmental changes were similar across groups. For boys in each trajectory, joint activities with the mother remained stable in childhood (between ages 7 and 10), and the groups did not differ on the rate of change. Between ages 10 and 16, joint activities significantly and linearly decreased for both non-offenders and offenders. For serious persistent offenders, the decrease in levels of joint activities stabilized by age 13. One group difference in rate of change was, however, found: Serious childhood offenders reported somewhat stronger decreases in joint activities between ages 10 and 13 than non-offenders.

Discussion

Transformations in parent-child relationships from childhood to late adolescence can run smoothly, but in some families parent-child relationships become impaired during adolescent years. This is in agreement with theoretical ideas and empirical studies that show a linkage between a problematic parent-child relationship and juvenile delinquency. From the perspective that different types of offenders can be differentiated according to their unique risk factors (Moffitt, 1993; Moffitt et al., 1996), the current study was the first of its kind to test the hypothesis that changes in the nature and quality of parent-child relationships would differ for boys in different offending trajectories. Findings indicated five offending trajectories, which differed in their parent-child relationships: Under the general condition of decreasing involvement of parents in their children's lives during the course of development, differential change in the relationship quality took place

depending on the offending trajectory of boys. The theoretical and practical implications of these findings will be discussed.

Parent-child relationship transformations for different offenders

In families of non-delinquents the relationship quality remained stably high during adolescence, however, parent-child involvement decreased linearly. These findings are in accordance with the developmental perspective that parent-child relationships in childhood transform gradually and smoothly during adolescence, with parents spending less time with their sons in joint activities without damaging the affective bonding (e.g., Collins & Steinberg, 2006), however, contradicts with earlier empirical work that does not distinguish delinquent from nondelinquent youth (e.g., De Goede et al., 2009; Keijsers et al., 2011). Our findings suggest that a decline in parental involvement is normative, but that such decline is not necessarily accompanied by a normative decrease in the affective quality of the parent-child relationship among nonoffending adolescents. In fact, theoretical ideas on normative developmental changes may not generalize to families in which children engage in offending, for instance because minor adolescent delinquency negatively affects the quality of parent-child relationships (e.g., Frijns, Keijsers, Branje, & Meeus, 2010; Laird, Pettit, Bates et al., 2003). Future research in which non-offenders and offenders are distinguished is needed to confirm this idea.

Adolescent-limited offenders reported high-quality relationships with their primary caretaker with parental involvement during childhood measured equally high as non-offenders. In adolescence, the relationship quality worsened considerably, however, thereby resembling the profile of serious persistent offenders from age 13 onwards. These

findings largely confirmed our hypotheses and also agree with recent study indicating that strongly declining affective qualities of parent-child relationships in adolescence co-occur with the development of moderate forms of adolescent delinquency for low-risk boys (e.g., Keijsers et al., 2009; Keijsers, Branje, Van der Valk et al., 2010; Laird, Pettit, Bates et al., 2003). Findings also suggest that from age 13 onwards, adolescent-limited offenders and serious persistent offenders are more difficult to distinguish from one another on the basis of parent-child relationship problems.

Confirming our hypotheses, serious persistent offenders had low-quality relationships lacking parental involvement in childhood, and these poor circumstances degenerated under the burdens of adolescence. In fact, findings revealed a divergent picture, in which the relationship problems of serious persistent juvenile offenders deteriorated with increasing age. This fits the notion that family processes can be an ongoing downward spiral of worsening family interactions, and that disruptive parent-child relations early in life are maintained and exacerbated throughout the process, in which of problem behavior manifest and intensify in the group of early-onset persistent offenders (Granic & Patterson, 2006; Patterson, Forgatch, Yoerger, & Stoolmiller, 1998; Patterson et al., 1990).

There was also a substantial group of boys who exhibited antisocial behavior in childhood, yet, abstained from delinquency in adolescence. In the current study, these individuals were labeled as serious and moderate childhood delinquents. Boys in these trajectories resembled the serious persistent offenders in terms of level of and developmental changes in parent-child relationships. This suggests that while the coercive family processes in which childhood problems may hinder healthy relationship development in adolescence may be taking place for these groups as well (Granic & Patterson, 2006; Patterson et al., 1990), other factors are protecting them from the delinquent track in adolescent years.

Together these findings suggest that different parent-child processes, as described in different theoretical accounts, occur for offenders in distinct trajectories. Whereas early coercive family processes (Granic & Patterson, 2006; Patterson et al., 1990) may be taking place for boys in the more serious trajectories, such processes do not seem to be present for adolescent-limited offenders. In fact, developmental changes in parent-child relationships for boys following an adolescent-limited trajectory seem well-captured by the recent reinterpretations of the monitoring literature (e.g., Keijsers et al., 2009; Keijsers, Branje, Van der Valk et al., 2010; Laird, Pettit, Bates et al., 2003). Furthermore, theoretical perspectives on smooth parent-child relationship development (e.g., Collins & Steinberg, 2006) may largely apply to non-offenders. When studying developmental changes in parent-child relationships,

it thus seems essential to distinguish youths who are involved in serious offending, transient adolescent offending, and youths who are not engaged in delinquent behaviors.

Limitations

This study also had several limitations. First, the sample was drawn from boys who predominantly indicated their mothers as their primary caretaker. These findings may not generalize to girls and to children's relationships with their fathers. Second, findings of group-based offending trajectories should be interpreted with caution (Nagin, 2005). Individuals who are 'assigned' to a trajectory may not actually follow this trajectory in real life. In addition, the number of trajectories, while quite robust between studies (Piquero, 2007), may vary as a function of the number of measurements, age ranges, samples characteristics, and operationalization of delinquency. Third, there is an ongoing scientific debate regarding which dimensions of parent-child relationships are related to child and adolescent norm-breaking and delinquency (review: Racz & McMahon, 2011). The current study could not address all relevant aspects of parent-child relationships, but rather used measures to assess two broad dimensions of parent-child relationships. Although tapping the quality of relationships and the level of joint activities may be relevant to our understanding of general developmental changes in parent-child relationships, future studies should also utilize more specific dimensions of relevance, such as adolescent voluntary disclosure, adolescent secrecy, and parental monitoring behaviors, including parental control and solicitation (Frijns et al., 2010; Stattin & Kerr, 2000). Furthermore, developmental changes in these specific behaviors (Keijsers et al., 2009; Keijsers, Branje, Frijns et al., 2010; Laird, Criss, Pettit, Bates, & Dodge, 2009; Laird, Pettit, Dodge, & Bates, 2003; Masche, 2010; Wang, Dishion, Stormshak, & Willett, 2011) may differ for boys in distinct offending trajectories. Also, measures with more items should be used, to better assess these dimensions. Finally, the current study did not aim to test whether problematic relationship transformations were the result of children's engagement in delinquency, or whether engagement in delinquency was the result of problematic family processes. Due to its design, causal inferences cannot be made from the current study (see also Keijsers et al., 2011). Using a descriptive method, we aimed to provide a detailed picture of the different relationship transformation problems that may occur in families with boys in different offending trajectories.

Practical implications

Our finding that the developmental course of the nature and quality of parent-child relationships dif-

fers for different offenders may have some implications for practitioners working with adolescent offenders. In practice, it can be a challenge to differentiate adolescent-limited from serious persistent offenders on basis of their levels of delinquency (Moffitt et al., 1996). The current study, moreover, indicates that relationship problems of adolescent-limited and serious persisting offenders are also alike during adolescent years. Developmental changes in parent-child relationships from childhood into adolescence were distinct, however, and could therefore provide a promising means by which adolescent-limited and serious persistent offenders may be differentiated in practice. In particular, whereas serious persistent juvenile offenders seem to have poor quality relationships with their caretakers in childhood, and even more so in adolescence, adolescent-limited offenders report good quality relationships until age 10. Hence, a retrospective assessment of the developmental changes in parent-child interactions from childhood into adolescence may provide unique and valuable information, and could be used to determine more accurately the offending trajectory of a given adolescent offender. This information could assist practitioners in deciding whether an intervention is needed, or whether the offending behavior should be considered a transient phenomenon as part of normal development towards adulthood that does not require immediate intervention.

Conclusion

In summary, this is the first study of its kind to show the unique developmental dynamics in parent-child relationships among boys with different patterns of offending. This suggests that a general theory on how parent-child relationships transform and how these transformations relate to adolescents' engagement in delinquency does not adequately describe variations among offenders. In fact, several theoretical perspectives on parent-child relationship development may largely apply to non-offenders only, and theoretical ideas on the role of parent-child relationships in the development of delinquency may apply solely to those in specific offending trajectories. Findings further suggest that a retrospective assessment of parent-child relationship transformations could help practitioners to determine more accurately the offending trajectory of a given adolescent offender.

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Key points

- It is theoretically assumed that different types of offenders exist, with their own unique etiologies, for instance in terms parent-child relationship development.
- This is the first study to examine whether transformations in parent-child relationships from childhood into adolescence vary between different offenders.
- The developmental course of the quality of parent-child relationships was different for non-offenders, adolescent-limited offenders, and serious persistent offenders.
- Findings suggest that practitioners can use a retrospective assessment of the developmental changes in parent-child relationships from childhood into adolescence to determine more accurately the offending trajectory of a given adolescent offender.

References

- Collins, W.A. (1990). Parent-child relationships in the transition to adolescence: Continuity and change in interaction, affect, and cognition. In T.P. Gullotta, R. Montemayor, & G.R. Adams (Eds.), *From childhood to adolescence: A transitional period?* (pp. 85–106). Thousand Oaks, CA: Sage.
- Collins, W.A., & Steinberg, L. (2006). Adolescent development in interpersonal context. In R.M. Lerner, E. Nancy, & D. William (Ed.), *Handbook of child psychology. Vol. 3, social, emotional, and personality development* (vol. 3, 6th edn, pp. 1003–1067). Hoboken, NJ: John Wiley & Sons.
- Conger, R.D., Lorenz, F.O., & Wickrama, K.A.S. (2004). Studying change in family relationships: The findings and their implications. In R.D. Conger, F.O. Lorenz, & K.A.S. Wickrama (Eds.), *Continuity and change in family relations: Theory, methods, and empirical findings* (pp. 383–403). Mahwah, NJ: Lawrence Erlbaum.
- De Goede, I., Branje, S., & Meeus, W. (2009). Developmental changes in adolescents' perceptions of relationships with their parents. *Journal of Youth and Adolescence*, 38, 75–88.
- Duncan, T.E., Duncan, S.C., Strycker, L.A., Li, F., & Alpert, A. (1999). *An introduction to latent variable growth curve modeling: Concepts, issues, and applications* (2nd edn). Mahwah, NJ: Lawrence Erlbaum.
- Farrington, D.P., Loeber, R., Stouthamer-Loeber, M., Van Kammen, W.B., & Schmidt, L. (1996). Self-reported delinquency and a combined delinquency seriousness scale based on boys, mothers, and teachers: Concurrent and predictive validity for african-americans and caucasians. *Criminology*, 34, 493–514.
- Frijns, T., Keijsers, L., Branje, S.J.T., & Meeus, W. (2010). What parents don't know and how it may affect their children: Qualifying the disclosure-adjustment link. *Journal of Adolescence*, 33, 261–270.

- Granic, I., & Patterson, G.R. (2006). Toward a comprehensive model of antisocial development: A dynamic systems approach. *Psychological Review*, 113, 101–131.
- Keijsers, L., Branje, S., Frijns, T., Finkenauer, C., & Meeus, W. (2010). Gender differences in keeping secrets from parents in adolescence. *Developmental Psychology*, 46, 293–298.
- Keijsers, L., Branje, S.J.T., Van der Valk, I.E., & Meeus, W. (2010). Reciprocal effects between parental solicitation, parental control, adolescent disclosure, and adolescent delinquency. *Journal of Research on Adolescence*, 20, 88–113.
- Keijsers, L., Frijns, T., Branje, S.J.T., & Meeus, W. (2009). Developmental links of adolescent disclosure parental solicitation and control with delinquency: Moderation by parental support. *Developmental Psychology*, 45, 1314–1327.
- Keijsers, L., & Laird, R.D. (2010). Introduction to special issue. Careful conversations: Adolescents managing their parents' access to information. *Journal of Adolescence*, 33, 255–259.
- Keijsers, L., Loeber, R., Branje, S., & Meeus, W. (2011). Bidirectional links and concurrent development of parent-child relationships and boys' offending behavior. *Journal of Abnormal Psychology*, 120, 878–889.
- Kerr, M., & Stattin, H. (2000). What parents know, how they know it, and several forms of adolescent adjustment: Further support for a reinterpretation of monitoring. *Developmental Psychology*, 36, 366–380.
- Kerr, M., Stattin, H., & Trost, K. (1999). To know you is to trust you: Parents' trust is rooted in child disclosure of information. *Journal of Adolescence*, 22, 737–752.
- Lacourse, E., Nagin, D., Tremblay, R.-E., Vitaro, F., & Claes, M. (2003). Developmental trajectories of boys' delinquent group membership and facilitation of violent behaviors during adolescence. *Development and Psychopathology*, 15, 183–197.
- Laird, R.D., Criss, M.M., Pettit, G.S., Bates, J.E., & Dodge, K.A. (2009). Developmental trajectories and antecedents of distal parental supervision. *The Journal of Early Adolescence*, 29, 258–284.
- Laird, R.D., Marrero, M.D., & Sentse, M. (2010). Revisiting parental monitoring: Evidence that parental solicitation can be effective when needed most. *Journal of Youth and Adolescence*, 39, 1431–1441.
- Laird, R.D., Pettit, G.S., Bates, J.E., & Dodge, K.A. (2003). Parents' monitoring-relevant knowledge and adolescents' delinquent behavior: Evidence of correlated developmental changes and reciprocal influences. *Child Development*, 74, 752–768.
- Laird, R.D., Pettit, G.S., Dodge, K.A., & Bates, J.E. (2003). Change in parents' monitoring knowledge: Links with parenting, relationship quality, adolescent beliefs, and antisocial behavior. *Social Development*, 12, 401–419.
- Larson, R.W., Richards, M.H., Moneta, G., Holmbeck, G., & Duckett, E. (1996). Changes in adolescents' daily interactions with their families from ages 10 to 18: Disengagement and transformation. *Developmental Psychology*, 32, 744–754.
- Loeber, R., & Dishion, T. (1983). Early predictors of male delinquency: A review. *Psychological Bulletin*, 94, 68–99.
- Loeber, R., Drinkwater, M., Yin, Y., Anderson, S.J., Schmidt, L.C., & Crawford, A. (2000). Stability of family interaction from ages 6 to 18. *Journal of Abnormal Child Psychology*, 28, 353–369.
- Loeber, R., Farrington, D.P., Stouthamer-Loeber, M., Moffitt, T.E., & Caspi, A. (1998). Development of male offending: Key findings from the first decade of the pittsburgh youth study. *Studies on Crime and Crime Prevention*, 7, 141–171.
- Loeber, R., Farrington, D.P., Stouthamer-Loeber, M., & Van Kammen, W.B. (1998). *Antisocial behavior and mental health problems: Explanatory factors in childhood and adolescence*. Mahwah, NJ: Lawrence Erlbaum.
- Loeber, R., Stouthamer-Loeber, M., Farrington, D.P., Lahey, B.B., Keenan, K., & White, H.R. (2002). Editorial introduction: Three longitudinal studies of children's development in pittsburgh: The developmental trends study, the pittsburgh youth study, and the pittsburgh girls study. *Criminal Behaviour and Mental Health*, 12, 1–23.
- Marshall, S.K., Tilton-Weaver, L.C., & Bosdet, L. (2005). Information management: Considering adolescents' regulation of parental knowledge. *Journal of Adolescence*, 28, 633–647.
- Masche, J.G. (2010). Explanation of normative declines in parents' knowledge about their adolescent children. *Journal of Adolescence*, 33, 271–284.
- Moffitt, T.E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, 100, 674–701.
- Moffitt, T.E., & Caspi, A. (2001). Childhood predictors differentiate life-course-persistent and adolescence-limited antisocial pathways among males and females. *Development and Psychopathology*, 13, 355–375.
- Moffitt, T.E., Caspi, A., Dickson, N., Silva, P., & Stanton, W. (1996). Childhood-onset versus adolescent-onset antisocial conduct problems in males: Natural history from ages 3 to 18 years. *Development and Psychopathology*, 8, 399–424.
- Muthen, B., & Muthen, L.K. (2000). Integrating person-centered and variable-centered analyses: Growth mixture modeling with latent trajectory classes. *Alcoholism: Clinical and Experimental Research*, 24, 882–891.
- Nagin, D.S. (2005). *Group-based modeling of development*. Cambridge, MA: Harvard University Press.
- Patterson, G.R., Bank, L., & Stoolmiller, M. (1990). The preadolescent's contributions to disrupted family process. In R. Montemayor, G.R. Adams, & T.P. Gullotta (Eds.), *From childhood to adolescence. A transitional period?* (pp. 107–133). Newbury Park, CA: Sage.
- Patterson, G.R., Forgatch, M.S., Yoerger, K.L., & Stoolmiller, M. (1998). Variables that initiate and maintain an early-onset trajectory for juvenile offending. *Development and Psychopathology*, 10, 531–547.
- Patterson, G.R., & Stouthamer-Loeber, M. (1984). The correlation of family management practices and delinquency. *Child Development*, 55, 1299–1307.
- Patterson, G.R., & Yoerger, K. (1997). A developmental model for late-onset delinquency. In W.D. Osgood (Ed.), *Motivation and delinquency* (pp. 119–177). Lincoln, NE: University of Nebraska Press.
- Pettit, G.S., Keiley, M.K., Laird, R.D., Bates, J.E., & Dodge, K.A. (2007). Predicting the developmental course of mother-reported monitoring across childhood and adolescence from early proactive parenting, child temperament, and parents' worries. *Journal of Family Psychology*, 21, 206–217.
- Piquero, A.R. (2007). Taking stock of developmental trajectories of criminal activity. In A.M. Liberman (Ed.), *The long view of crime: A synthesis of longitudinal research* (pp. 23–78). New York: Springer.
- Racz, S.J., & McMahon, R.J. (2011). The relationship between parental knowledge and monitoring and child and adolescent conduct problems: A 10-year update. *Clinical Child and Family Psychology Review*, 14, 377–398.
- Reid, J.B., & Patterson, G.R. (1989). The development of antisocial behaviour patterns in childhood and adolescence. *European Journal of Personality*, 3, 107–119.
- Shanahan, L., McHale, S.M., Crouter, A.C., & Osgood, D.W. (2007). Warmth with mothers and fathers from middle childhood to late adolescence: Within- and between-families comparisons. *Developmental Psychology*, 43, 551–563.
- Smetana, J.G., Metzger, A., Gettman, D.C., & Campione-Barr, N. (2006). Disclosure and secrecy in adolescent-parent relationships. *Child Development*, 77, 201–217.
- Stattin, H., & Kerr, M. (2000). Parental monitoring: A reinterpretation. *Child Development*, 71, 1072–1085.

- Steinberg, L. (1990). Autonomy, conflict, and harmony in the family relationship. In G.R. Elliott, & S.S. Feldman (Eds.), *At the threshold: The developing adolescent* (pp. 255–276). Cambridge, MA: Harvard University Press.
- Stouthamer-Loeber, M., Loeber, R., Wei, E., Farrington, D.P., & Wikstrom, P.O.H. (2002). Risk and promotive effects in the explanation of persistent serious delinquency in boys. *Journal of Consulting and Clinical Psychology, 70*, 111–123.
- Wang, M.T., Dishion, T.J., Stormshak, E.A., & Willett, J.B. (2011). Trajectories of family management practices and early adolescent behavioral outcomes. *Developmental Psychology, 47*, 1324–1341.
- Willoughby, T., & Hamza, C.A. (2010). A longitudinal examination of the bidirectional associations among perceived parenting behaviors, adolescent disclosure and problem behavior across the high school years. *Journal of Youth and Adolescence, 40*, 463–478.

Appendix 1: Questionnaires

Relationship quality

In the past year, how often have you....

1. Thought your mother was really good?
2. Thought your mother really bugged you a lot?
3. Felt proud of your mother?
4. Wished that you had a different mother?
5. Thought that your mother gave you problems?
6. Felt that your mother was easy to get along with?
7. Felt that your mother loved you?
8. Felt that your mother was too strict or hard on you?
9. Wished that your mother would just leave you alone?
10. Liked being your mothers kid?
11. Felt that your mother was happy?
12. Felt that when your mother said something, she really meant it?
13. Felt that when your mother punished you, you got the punishment that you deserved?

Joint activities

1. How often do you and your mom do things together at home?
2. On weekdays, how often do you do something together with your mom, like making something, playing a game, talking, or going out together?
3. And on weekend days?
4. How often do your help your mom?

Appendix 2: Background characteristics of five distinct developmental offending trajectories from childhood to late adolescence

Trajectory	Background		
	% caretaker = biological mother	High-risk at screening (%)	Black ethnicity (%)
Non-delinquents	97.5	24.2	45.8
Moderate childhood delinquents	96.6	52.7	57.4
Adolescent-limited delinquents	97.9	31.9	55.3
Serious childhood delinquents	95.8	70.0	69.2
Serious persistent delinquents	97.0	73.1	61.2
Total	96.8	50.8	57.8

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