CAMBRIDGE
UNIVERSITY PRESS

Regular Article

Longitudinal associations between early risk and adolescent delinquency: Mediators, moderators, and main effects

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Abstract

Although multiple domains of risk are theorized to predict adolescent delinquency, father-specific risk in the context of other risks is under-researched. Using the low-income Future of Families and Child Wellbeing cohort (48% Black, 27% Hispanic, 21% White, 51% boy, $N = 4,255$), the current study addressed three research questions. (1) are father-, mother-, child-, and family-level cumulative risk during early childhood associated with adolescent delinquent behavior?, (2) does child self-control in middle childhood mediate the associations between fathers' and mothers' cumulative risk and adolescent delinquent behavior, and do quality of parent's relationships with children and parental monitoring in middle childhood mediate the association between child cumulative risk and delinquent behavior?, (3) do parenting, quality of parent-child relationships in middle childhood, and child sex at birth moderate the associations among fathers', mothers', children's, and family risk and adolescent delinquent behavior? Results indicated father, child, and mother risk at ages 3–5 were significantly and positively associated with youth-reported delinquent behavior. Higher levels of family risk were associated with less delinquency when 9-year-olds felt closer to fathers than when they felt less close. Children's self-control at age 9 mediated the associations between father and child risk and delinquent behavior.

Keywords: Delinquency; father involvement; Future of Families and Child Wellbeing; resilience; risk

Adolescent delinquency has impactful and long-lasting negative effects on development and society (Roberson & Azaola, 2021; Thornberry & Krohn, 2000). Adolescents who engage in delinquent behaviors (i.e., behaviors that are illegal, carry risk of arrest, or if committed by an adult would violate criminal law) are more likely to perform poorly in school (Robison et al., 2017), abuse substances (Rocca et al., 2019), and engage with delinquent peers (Walters, 2020). As adults, they are more likely to be unemployed, arrested, and incarcerated, have poor physical and mental health, and engage in antisocial behavior (Carter, 2019; Drury et al., 2020; Kim et al., 2020).

Researchers have found that exposure to parent-, peer-, school-, community-, and family-level risk factors predict adolescent delinquency (Roberson & Azaola, 2021). Some of the most significant risk and protective factors for delinquency reside in the family system (Labella & Masten, 2018; Salmanian et al., 2021). Studies have examined family risk as a set of characteristics of the home environment (e.g., chaotic home environment, Jacobsen & Zaatut, 2022) and of the mother (e.g., maternal distress, Choe et al.,

2013). In recent years, researchers have focused on children's exposure to adverse childhood experiences (ACEs; e.g., child abuse, domestic violence; Jones & Pierce, 2021; Perez et al., 2018). The ACEs research has made important contributions to our understanding of risk for delinquency. However, it has not always distinguished the source of the risk — mother, father, another family member, or overall family that contributes to the occurrence of the risk. In particular, few studies of adolescent delinquency include fathers' risk (Simmons et al., 2018). This is a significant gap considering that fathers' and mothers' risk in heterosexual parental relationships independently contribute to children's outcomes (for review, see Cabrera et al., 2011). Research that focuses on low-income father-level risk (in addition to mother-, child-, and overall family-level risk) is needed because low-income men tend to experience more risk factors and reduced father involvement with children than higher income fathers (Kotila & Kamp Dush, 2013).

Framed within a risk and resilience perspective (Masten, 2018) and Sameroff's (2009) transactional model of development, this study addresses these gaps by including father-level risk in addition to mother-, child-, and family-level risks, as predictors of adolescent delinquent behavior. In addition, the study examines how fathers' and mothers' relationships with children, parental monitoring, and children's self-control may explain the association between all sources of risk and youth behaviors. Using data from the Future of Families and Child Wellbeing Study (FFCW), we address the following research questions: (1) are low-income fathers', mothers', children's, and family-level risk factors during early childhood associated with adolescent delinquent behavior, (2) does child self-control in middle

childhood mediate the associations between fathers', mothers', and family risk in early childhood and adolescent delinquent behavior, and do quality of parent's relationships with children and parental monitoring in middle childhood mediate the association between child risk in early childhood and delinquent behavior, and (3) do parents' engagement with children in early childhood, quality of parent's relationships with children and parental monitoring in middle childhood, and child sex at birth moderate the associations among fathers', mothers', children's, and family risk during early childhood and adolescent delinquent behavior? The focus of this study is on risk factors early in children's lives because early risk may be especially predictive of delinquent behavior in adolescence (see Murray et al., 2010; Trentacosta et al., 2013).

Theoretical foundation

The current study is guided by Masten's (2018) risk and resilience perspective and transactional theory (Sameroff, 2009). The risk perspective maintains that children's development is compromised by exposure to adverse psychological or social factors because they increase the likelihood of poor outcomes (Masten, 2013). In contrast, the resilience perspective posits that the negative impact of risk on development can be mitigated by protective factors, which can increase a child's adaptive functioning (Masten, 2013). Risk studies have sometimes examined one or two risk factors (e.g., incarceration) and at other times a constellation of risk factors (e.g., cumulative risk) in relation to child outcomes. Current thinking about risk suggests that the higher the number of risk factors present in a child's life, the greater the probability of delinquent acts (LoBraico et al., 2020; Reingle et al., 2012). Sameroff and MacKenzie (2003) argue that assessing a constellation of risk factors best captures the contextual complexities in which children develop. Researchers have also debated whether it is best to examine this constellation of risk factors separately or as additive composites in relation to outcomes (Evans et al., 2013). In the additive model, each risk factor is given equal weight and then summed to construct a composite of risk. Although the additive model does not distinguish among the effects of individual risk factors, it is advantageous because type of risk may be less important than the total number of risk factors (Evans et al., 2013; Trentacosta et al., 2013). Moreover, children's exposure to various forms of risk tend to co-occur rather than exist in isolation (Ayoub et al., 2009).

Current theory also points to the importance of examining multiple sources of cumulative risk in relation to child outcomes (Masten, 2013; Sameroff & Mackenzie, 2003). Risk can occur at the individual, family, community, and societal levels (Masten, 2013). The current study focuses on cumulative individual and family risk. Individual risk refers to characteristics of the person (i.e., fathers, mothers, children) that may increase the likelihood of poor child outcomes (Luthar, 1991). Family risk refers to characteristics and properties of the family as a whole that may be associated with poor child outcomes (e.g., household poverty, see LoBraico et al., 2020). A number of studies have examined multiple sources of cumulative risk in relation to adolescent delinquent behavior. For example, Trentacosta et al. (2013) found that multiple cumulative risk domains (early child sociodemographic risk, caregiving risk, and child attributes risk) significantly predicted a disruptive behavior diagnosis in adolescence. Using FFCW data, Miller et al. (2021) found that multiple sources of cumulative risk, including caregiving deprivation and various threats such as interpersonal violence, from birth to age 3 significantly predicted higher levels of internalizing and externalizing

behavior at age 15. In a study of 466 European American and 100 African American boys and girls from a broad range of socioeconomic levels, Deater-Deckard et al. (1998) found that cumulative risk in multiple domains (child, sociocultural, parenting, peer-related) at age 5 predicted 19%–32% of the variance in children's externalizing behaviors in middle childhood. There is growing recognition that fathers' risk factors contribute to adolescent delinquency, yet, these studies examine father risk in isolation from other sources of risk (e.g., Simmons et al., 2018; Swisher & Roettger, 2012; Yan et al., 2021). We are not aware of any studies that have included cumulative father-level risk in addition to mother-, child-, and family-level risk in studies of adolescent delinquency.

Sources of risk

Fathers' and mothers' risk
Research conducted with low-income families indicates that key parental risk factors are similar for fathers and mothers and include criminal justice involvement, depressive symptoms, substance and alcohol abuse, poor health, unemployment, and low education (Fagan, & Wildfeuer, 2022). Researchers using FFCW data found that mothers of adolescents who self-report delinquent behaviors are more likely to have been charged with breaking the law than mothers of adolescents who have not (Marçal & Maguire-Jack, 2021). Studies of low-income families have shown positive associations among maternal depression, parents' drug and alcohol abuse, and adolescents' delinquent behavior (Jackson, 2013; Marçal, 2021; Wickham et al., 2015). Parents' poor physical health has been identified as a risk factor for youth conduct disorder because it increases stress within low-income families (BeLue et al., 2015). Parental unemployment was also a significant correlate of working-class fathers' and mothers' stress in parenting (Nomaguchi & Johnson, 2016) as well as adolescent delinquency (Fleisher, 1963). Finally, in a longitudinal study of 856 third graders in a semi-rural county in New York State, Dubow et al. (2009) found significant associations between parents' low education levels and long-term child outcomes including youth aggression and low educational motivation.

Children's risk
Transactional theory suggests that children are active agents of their own development and, as such, are not only influenced by their parents, but they also influence their parents (Sameroff, 2009). Research reviews indicate that key child-level risk factors for delinquency include speech and language problems, attention problems, aggression, depression, anxiety, and poor health (Shader, 2003). Researchers have reported high rates of language impairments in conduct disordered and incarcerated youth (Brownlie et al., 2004). Meta-analyses indicated significantly increased rates of attention-deficit/hyperactivity disorder in juvenile offenders (Baggio et al., 2018). Childhood aggressive behavior during the early years (Koops & de Castro, 2006) and childhood depression and anxiety (Fontaine et al., 2019) have been found also to be longitudinally associated with delinquent behavior. Twelfth grade students with poor health lifestyles (e.g., lack of vigorous exercise, lack of sleep) were significantly more likely to engage in delinquent behaviors, compared with those with healthier lifestyles (Semenza, 2018).

Family risk
Key family-level risk factors include household poverty, family instability (i.e., repeated changes in family structure especially

during early childhood), residential mobility, biological father not residing with the child, and intimate partner violence (IPV) (Murray & Farrington, 2010). Household poverty (i.e., total household income below the poverty line) is positively associated with youth delinquent behavior (Rekker et al., 2015; Roberson & Azaola, 2021). Using US Panel Study of Income Dynamics data, Bosick and Fomby (2018) found that family instability during childhood predicted 18–26-year-old males' higher likelihood of arrest or incarceration. Decades of research have documented an association between residential mobility and youth delinquent behavior (Gasper et al., 2010). Researchers have conceptualized households with no biological father present as a contextual source of stress on children (Kotila & Kamp Dush, 2013); children raised in a household with no biological father present are more likely to engage in youth delinquent behavior than children living with two biological parents (Leiber et al., 2009). The US Office of Juvenile Justice and Delinquency Prevention includes IPV as a family risk factor because it takes place *between* romantic partners who may or may not live together (Development Services Group, Inc. 2015). Comprehensive reviews of research have shown that children are at greater risk for youth delinquency when their parents are victims of IPV (Artz et al., 2014).

Moderators

Protective factors may buffer children from the negative effects of adversity and risk. Masten (2018) suggests that parenting and caregiver–child relationships are promotive factors that can increase child resilience and help children to develop the skills they need in the context of risk. The quality of fathers' and mothers' affective relationships (e.g., attachments) with children and parents' positive engagement with children profoundly influence children's development (Ainsworth, 1989; Cassidy & Shaver, 2018; Sameroff, 2009). Driscoll and Pianta (2011) suggest that individuals' representations of attachment are best described as closeness (warmth, affection, and open communication) and conflict (behavioral opposition or overt disagreement). Children with close parental relationships and low to moderate levels of relationship conflict during childhood should be protected against the negative effects of father-, mother-, child- and family-level risk across time on their development (Gerlach et al., 2022; Hoeve et al., 2009; Yoder et al., 2016). Children with close parental relationships draw parents to them when experiencing distress, have better problem-solving skills and relationships with peers and adults, and are generally happier than children who are not as close and have more conflict with their parents (Moretti & Peled, 2004).

Researchers have found that close and supportive parental monitoring is an important protective factor for delinquency and is also associated with less increase in delinquent behaviors over time (Hoeve et al., 2009; Murphy et al., 2009; Tilton-Weaver et al., 2013). Longitudinal evidence based on a large cohort of adolescents in 5th–7th grades showed that parental monitoring buffered (i.e., protected against) the negative effects of community violence exposure on youth delinquent behavior (Low & Espelage, 2014).

Child sex at birth has been found to protect children against the negative effects of risk factors on youth delinquent behavior. For example, boys exposed to child sexual abuse are more likely to display delinquent behavior than girls (Gauthier-Duchesne et al., 2022). Boys display more externalizing behaviors than girls when fathers are absent from the household (Mott et al., 1997). Using data from the Longitudinal Studies of Child Abuse and Neglect, Leban (2021) found that boys who experienced higher ACEs were

at greater risk of externalizing trajectories than girls. These studies as well as research showing that boys are twice as likely as girls to be arrested for violent crimes (Cauffman, 2008) appear to indicate that being a girl protects children against delinquency. In this study we test whether child sex at birth moderates the association among father, mother, child, family risk, and delinquent behavior.

Mediators

Sameroff's (2009) transactional model focuses on the complex influence that child behaviors have on parental behaviors and vice versa. The influence that children have on parents and parents have on children has been examined extensively (e.g., Lansford et al., 2018). Essentially, the transactional model suggests that child behavior (e.g., early child risk) triggers parental responses (Fiese & Sameroff, 1989) and influences parent–child relationships, and parent and family risk influence child behaviors. These transactional processes can be examined with tests of mediation. Researchers suggest that children's self-control is an important mediator of the association between early childhood parental and family risk and delinquent behavior (Meldrum et al., 2020). Residing in a home with high levels of parental and family risk may expose children to highly stressful environments whereby parents are less emotionally available, provide less guidance about how to improve self-control, and do not model effective self-control strategies (Jackson et al., 2023). Jackson et al. (2023) found children's lack of self-control in school partially mediated the relationship between exposure to ACEs (i.e., ACEs include both family and parental risk factors) and later youth delinquency (Jackson et al., 2023). Similarly, Fava et al. (2022) found that self-control (and sleep problems) in early adolescence mediated the association between ACEs exposure before age 11 and delinquent behaviors in late adolescence. In a study of Portuguese boys, children's self-control partially mediated the association between exposure to trauma (e.g., parental abuse) and youth antisociality/criminality (Pechorro et al., 2021). Researchers have also examined the mediational influence of parenting behavior on the association between early child risk and youth delinquency. Nelson et al. (2019) found that severe hyperactivity at age 5 was associated with youth delinquency because it increased maternal hostility toward 10-year-olds. To the best of our knowledge, researchers have not examined the simultaneous transactional processes in which child self-control mediates the association between early father, mother, and family cumulative risk and youth delinquent behavior, and parental monitoring and parent–child relationships mediate the association between early child risk and youth delinquent behavior.

Current study

The current study examined the associations among father-, mother-, child-, and family-level risk during early childhood and adolescent delinquent behavior. On the basis of studies showing that risk at each of these levels predicts delinquency, we constructed separate cumulative risk composites by adding together the risk variables for each individual (e.g., fathers) and for the overall family. The main effects of each composite are examined in a multivariate, structural equation model in relation to delinquency. We focus on cumulative risk at ages 3–5 because research evidence and theory suggest early childhood is a sensitive developmental period for risk exposure (Feng et al., 2008). Although delinquent behavior peaks at around ages 16-18 (Farrington, 2004), we assessed delinquent behavior at age 15

because FFCW only collected adolescent data at this age. Drawing from the rich FFCW longitudinal data, we were able to support temporal sequencing assumptions by assessing mediators (father–child closeness, mother–child closeness, parental monitoring, child self-control) at 9 years. In addition, middle childhood is an important transition point for development of self-control (Pener-Tessler et al., 2022).

Based on the risk and resilience perspective and the plethora of studies that have found direct associations between fathers', mothers', children's, and family risk and youth delinquent behavior (e.g., Baggio et al., 2018, Bosick & Fomby, 2018), the current study tests the following hypothesis:

H1: Father-, mother-, child-, and family-level cumulative risk at ages 3–5 will be positively associated with adolescent delinquent behavior (main effects hypotheses).

Based on transactional theory and evidence that parenting mediates the association between child risk and delinquent behavior (e.g., Nelson et al., 2019), and child self-control mediates the associations among parent and family risk and delinquent behavior (e.g., Pechorro et al., 2021) the current study hypothesizes:

H2: Father, mother, and family cumulative risk at ages 3–5 will be indirectly associated with adolescent delinquent behavior via lower levels of child self-control at age 9, and child risk at age 5 will be indirectly associated with delinquent behavior via its association with lower parental monitoring at age 9 and lower levels of parent–child relationship closeness at age 9 (mediation hypotheses).

Based on the risk and resilience perspective (Masten, 2018) and evidence that higher levels of father and mother engagement with children during early childhood and closer parent–child relationships protect children from the negative influences of cumulative risk (Gerlach et al., 2022; Hoeve et al., 2009; Yoder et al., 2016), the current study hypothesizes:

H3: Higher levels of parental engagement with children at age 5, closer relationships with fathers and mothers at age 9, and higher parental monitoring at age 9 will protect children from the negative effects of father-, mother-, child-, and family-level cumulative risk at ages 3–5 on adolescent delinquent behaviors (moderation hypothesis).

Child sex at birth is also expected to influence the association between risk and delinquent behaviors.

H4: The associations among father-, mother-, child-, and family-level cumulative risk at ages 3–5 and delinquent behavior will be stronger for boys than girls (moderation hypothesis).

Method

This study used the FFCW study, which followed a cohort of nearly 5,000 children born in large United States cities between 1998 and 2000. The sampling approach resulted in a large number of Black, Hispanic, and low-income families and oversampled births to unmarried couples (McLanahan & Garfinkel, 2000). Fathers and mothers were interviewed shortly after the birth of their focal child (baseline) and again when children were 1 (Y1), 3 (Y3), 5 (Y5), 9 (Y9), and 15 (Y15) years of age. Children were interviewed at Y9 and Y15. The study sample was comprised of 3,710 unwed couples and 1,187 married couples at baseline. The analytic sample in the present study ($n = 4,255$) was limited to cases in which the child resided with the biological mother and did not have autism, mental retardation, or down's syndrome ($n = 416$ omitted). Cases were omitted also when data on all study variables (e.g., fathers' cumulative risk, mother–child closeness) were missing ($n = 226$).

Table 1. Participant characteristics

Variable	n	%	M	SD
Mother's race/ethnicity				
White, non-Hispanic	905	21.3		
Black, non-Hispanic	2,038			
Hispanic	1,144	26.9		
Other	158	3.7		
Missing	10	0.2		
Mother's education				
Less than high school	1,442	33.9		
High school or equivalent	1,297	30.5		
Some college/technical school	1,049	24.7		
College or graduate school	462	10.9		
Missing	5	0.1		
Father's education				
Less than high school	1,396	32.8		
High school or equivalent	1,380	32.4		
Some college/technical school	907	21.3		
College or graduate school	421	9.9		
Missing	151	3.5		
Mother–father relationship, Y5				
Married	1,263	29.7		
Romantic	651	15.3		
Separated	254	6.0		
Divorced	121	2.8		
Friends	719	16.9		
No relationship	888	20.9		
Missing	359	8.5		
Mother–father co-reside, Y5	1,817	42.7		
Mother–father co-reside, Y9	1,287	30.2		
M household income ≤ poverty line	1,596	50.0		
M household income, Y5, median			24,000	43,690
Mother's age, baseline, M			25.18	6.08
Father's age, baseline, M			27.85	7.12
Child sex at birth				
Boy	2,185	51.4		
Girl	2,073	48.6		

The first author of this paper received institutional review board approval for this study. The study analysis code is available from the first author. This study was not preregistered.

Sample characteristics

As shown in Table 1 slightly less than half of the mothers in the sample were Black (47.9%). Less than one-third were Hispanic (26.9%), non-Hispanic White (21.3%), and Other race/ethnicity (3.7%). Approximately one-third of mothers (33.9%) and fathers (32.8%) completed less than high school at baseline. The median household income at Y5 was $24,000. On average, mothers and

Measures

Adolescent delinquent behavior

Delinquent behavior at Y15 was measured using items from the National Longitudinal Study of Adolescent Health (Add Health) Wave I and Wave II Home Visit interviews with teenagers. The adapted FFCW survey included 13 of the items from the original Add Health survey (e.g., deliberately damaged property, taken something from a store without paying for it, gotten into a serious physical fight). Adolescents indicated whether they engaged in each delinquent behavior *never* (0), *1 or 2 times* (1), *3 or 4 times* (2), or *5 or more times* (3). The items are then summed to construct a measure of self-reported delinquent behavior (range: 0-39; $\alpha = .74$).

Risk variables

Four risk composite variables were constructed by adding together risk items for fathers, mothers, children, and families.

Fathers' and mothers' cumulative risk

Six indicators of fathers' and mothers' risk at Y3 and/or Y5 were assessed: drug and/or alcohol abuse, unemployment, being charged with breaking the law, depressive symptoms, low education, and poor health status. All indicators were dichotomous variables coded so that 0 = *no risk* and 1 = *presence of risk*. The items were identical at Y3 and Y5 except education, a relatively static construct asked only at Y3. Parents who indicated that they experienced a risk factor at either Y3 or Y5, or at both times, were then coded as having experienced risk in that category (e.g., depressive symptoms at Y3 and/or Y5). The father risk indicators at Y3/Y5 were added together to construct a single measure of early childhood fathers' cumulative risk; the same was done for mothers. Thus, each parent's cumulative risk could range from 0-6.

To assess *drug and/or alcohol abuse*, each parent was asked two questions at Y3 and Y5: "In the past year, was there ever a time drinking interfered with your life?" and "In the past year, did your drug use interfere with life?" Those who answered *yes* to either question were coded as having problems with drugs/alcohol at Y3 or Y5.

Unemployment was measured with two items at Y3 and Y5 that asked parents whether they did any regular work for pay in the last week and whether they were looking for work. Parents who indicated that they did not work in the past week and were looking for work were coded 1 = *unemployed.* Otherwise, parents were coded 0 = *employed or not looking for work.*

Mothers and fathers were also asked at Y3 and Y5 whether the police or courts had charged them with *breaking the law* in the past two years. Parents who answered affirmatively were scored with 1; others received a score of 0.

The Composite International Diagnostic Interview-Short Form (CIDI-SF, Kessler et al., 1998) was used at Y3 and Y5 to classify parents according to criteria for a DSM-IV major *depressive episode.* Parents were asked screening questions about whether they have had feelings of depression ("Did you feel sad or blue for two more weeks in the past 12 months?"). If so, they were asked specific questions regarding: (1) losing interest, (2) feeling tired, (3) change in weight, (4) trouble sleeping, (5) trouble concentrating, (6) feeling worthless, and (7) thinking about death. The constructed dichotomous variable for a depressive episode is based on a liberal definition of depression, requiring an affirmative response to the screening question and parent report of experiencing three or more of the specific CIDI-SF items.

Mother's and father's *educational risk* were based on each parent's report of the highest level of education completed at Y3 (1 = *less than high school diploma*, 2 = *high school diploma or equivalent*, 3 = *some college or technical training*, 4 = *college graduate or graduate school*). Parents who completed less than a high school diploma were coded as having *educational risk* = 1. Parents who completed high school or higher were coded as having *no educational risk* = 0.

Data regarding *poor health status* was obtained from the question, "In general, how is your health?" which was posed to fathers and mothers at Y3 and Y5. Responses to this question ranged from 1 = *excellent* to 5 = *poor*. Parents who indicated that their health was *fair* or *poor* were coded as having health risk (= 1). All other parents were coded as having no risk (= 0).

Child risk

Six indicators of child risk were assessed: poor health, speech and language problems, and four indicators of child behavioral risk. Data regarding child's *poor health status* were obtained from the Y3 and Y5 primary caregiver questionnaire (mostly mothers) that asked, "In general, how would you describe your child's health?". Responses to this question ranged from 1 = *excellent* to 5 = *poor*. Parents who indicated that the child's health was *fair* or *poor* at Y3 and/or Y5 were coded as having health risk (= 1). All other children were coded as having no risk (= 0). Data regarding child's *speech and language problems* were obtained from the Y5 primary caregiver questionnaire that asked, "Has a doctor told you that your child has a speech/language problem?" Responses to this question were 1 = *yes* and 0 = *no*.

The Child Behavior Checklist/2–3 and 4–18 (CBCL, Achenbach, 1992; Achenbach & Rescorla, 2001) were administered to parent caregivers at Y3 and Y5 to assess children's problem behaviors. The FFCW survey forms at Y3 and Y5 included most of the CBCL items (56 of the original 100 behavior problem items at Y3, and 72 out of the original 113 items at Y5). Items from the *Withdrawn/Depressed* (8 items at Y3 and 9 items at Y5, $\alpha = .65$, .56), *Anxious/Depressed* (8 items at Y3 and 13 items at Y5, $\alpha = .65$, .61), *Aggression* (19 items at Y3 and 20 items at Y5, $\alpha = .84$, .84), and *Attention Problems* (6 items at Y3 and 11 items at Y5, $\alpha = .71$, .67) subscales were used in this study. Respondents rated each behavior on a scale from 0 = *not true* to 2 = *very true or often true*. Children who obtained a subscale score 2 standard deviations above the mean at Y3 and/or Y5 were then designated as risk (= 1) (e.g., attention problems at Y3 and/or Y5). The normative CBCL scores were not be used to establish clinical cutoffs because FFCW did not use all items in the full measure.

Family risk

Five indicators of overall family risk at Y3 and Y5 were assessed: IPV, residential mobility, the biological father not residing with the child, household poverty, and family instability. IPV at Y3 was assessed with one item that asked mothers whether they have been seriously hurt in a fight with the other parent since the child's birth. At Y5, mothers were asked the same question about the last two years. Reports of being hurt in a fight at Y3 and/or Y5 were coded as risk (= 1). Absence of such reports were coded as no risk (= 0).

Residential mobility was assessed with two items where mothers reported how many times the family moved at Y3 (since birth) and Y5 (in the last two years). Mothers who indicated that the family moved two or more times at Y3 and/or Y5 were rated as having risk (= 1). Mothers who indicated that the family moved once or not at all at Y3 and Y5 were rated as having no risk (= 0).

Data regarding the biological father not residing with the child was obtained from the Y3 and Y5 constructed variables that indicated whether or not the biological parents lived together all or most of the time or 7 nights per week. Parents who did not reside together all or most of the time or 7 nights per week at Y3 and/or Y5 were rated as having risk (= 1). Those who lived together at Y3 and Y5 were rated as no risk (= 0).

Household poverty was based on FFCW constructed variables of poverty categories at Y3 and Y5: 1 = 0%–49% of the poverty line, 2 = 50%–99%, 3 = 100%–199%, 4 = 200%–299%, 5 = 300%+). These were determined by mothers' reports of total household income and size for the past 12 months, and the official poverty thresholds for the corresponding years. Poverty status was recoded so that 1 = *less than 100% of the poverty line* at Y3 and/or Y5 and 0 = *100% of the poverty line or greater* at Y3 and Y5.

Family instability was measured by maternal reports of the number of changes a child has experienced in coresident family structure from birth to Y5 that resulted from a mother's union (marriage and cohabitation) dissolution or new formation (see Fomby & Osborne, 2017). Transitions from cohabitation to marriage as a union status change were not included. The number of family transitions reported by mothers ranged from 0 to 3. Instability was defined as having 1 or more transitions based on evidence that on average, children nationwide experience .43 relationship transitions through age 5 (Brown et al., 2016). Sensitivity analyses further verified that having 1 or more transitions was a better predictor of adolescent delinquency than having 2 or more transitions ($rs = .11, .07$, respectively).

Moderating (protective) and mediating variables

Parent–child relationship closeness at Y9 was indicated by the focal child's response to six parallel questions pertaining to their relationships with the mother and biological father. Two items were obtained from the National Survey of Children's Health: "How close do you feel with your mom/dad?" (0 = *not very close* to 3 = *extremely close*) and "How well do you and your mom/dad share ideas or talk about things that matter" (0 = *not very well* to 3 = *extremely well*). These items have been shown to be strong markers of the quality of parent–child relationships (Bandy & Moore, 2008). Four items asked the child to indicate the degree to which the parent includes them in important decisions, listens to their side of an argument, spends enough time with them, and misses events or activities that are important to them. These items are measured on a scale from 0 = *never* to 3 = *always*. The six mother items ($\alpha = .68$) and six father items ($\alpha = .75$) were summed to construct an observed measure of children's perceptions of mother–child closeness and father–child closeness, respectively.

Father and mother engagement with child (8 items for each parent) were included at Y5 and were reported by mothers and fathers. Response options ranged from 0 = *no days per week* to 7 = *seven days per week*. Sample self-report items included how often the parent plays games, sings songs or nursery rhymes, reads stories, plays inside with toys, and hugs or shows physical affection. Parents' responses to the items were summed, with higher scores indicating higher levels of engagement (father $\alpha = .90$, mother $\alpha = .69$, range = 0–56).

Parental monitoring was assessed with five child reported items at Y9. Children were asked how often the primary caregiver knows what you are doing during free time, which friends you hang out with, things that happen when you are not with her/him, where you are going and with whom, and what you spend money on. Item scores ranged from 0 = *never* to 3 = *always*. A latent variable was derived from the five monitoring items because of low reliability ($\alpha = .46$, range = 0–15).

FFCW used the Social Skills Rating System (SSRS-T[teacher report], Gresham & Elliott, 1984) to assess *child self-control* at Y9 (10 items from the teacher version). Teacher perceptions of self-control in the classroom are highly predictive of child outcomes including delinquent behavior and student graduation from high school, even after accounting for students' achievement, background characteristics, and school aspirations (Soland, 2017). Teachers are asked to rate the child's behavior from 1 = *never* to 4 = *very often*. Sample items include: controls temper in conflict with peers, receives criticism well, and accepts peers' ideas for group activities. The SSRS-T is a reliable and valid teacher rating scale of children's social behavior in terms of temporal stability, internal consistency, inter-rater reliability, and construct and criterion validity (Elliott et al., 1988). Gresham et al. (2011) reported strong reliability and validity for the teacher report of classroom-related self-control, and Walthall et al. (2005) found good support for the factor structure of child self-control (teacher report) and consistency in the factor structure based on race and gender. The self-control items were summed ($\alpha = .94$, range = 10 to 40).

Child sex assigned at birth was included as a moderator (1 = *female*, 0 = *male*). This variable was obtained from the baseline interview with mothers.
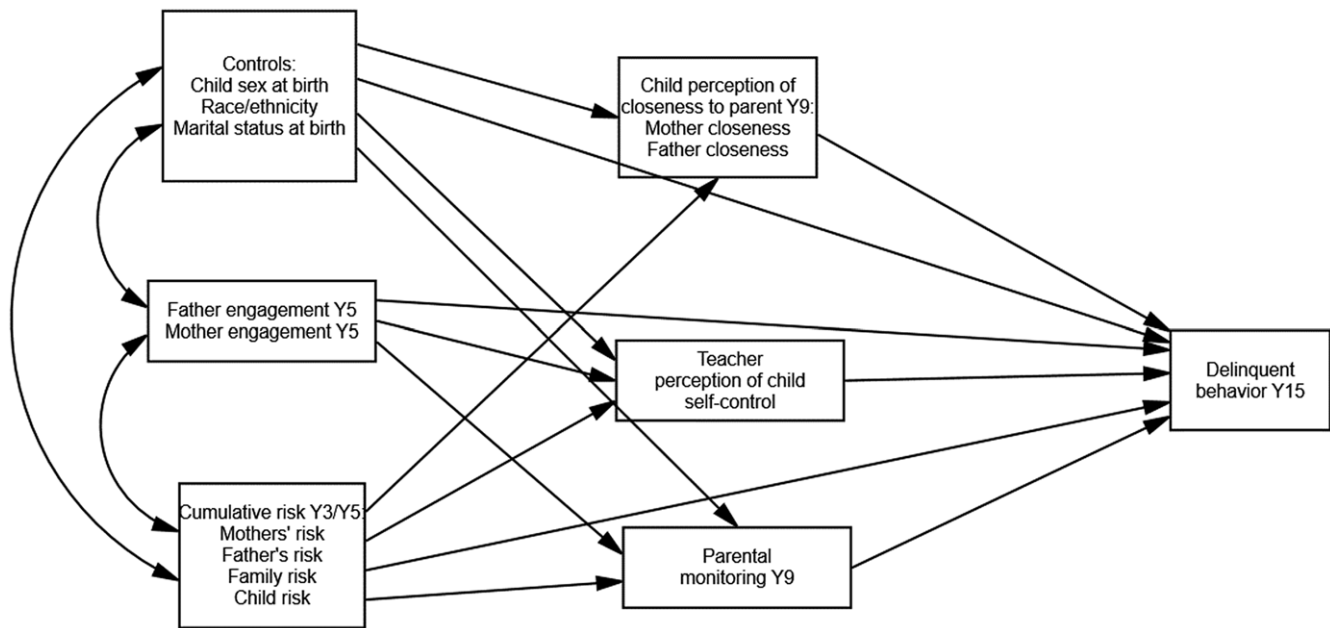
Controls

Youths of color are more likely than White youth to be arrested for violent behavior and to be incarcerated in juvenile delinquency centers (Abrams et al., 2021). Therefore, we controlled for *mother's race/ethnicity*, which was measured at baseline based on mother's report indicating whether she was Non-Hispanic White, Black, Hispanic, or Other (includes Asian American and American Indian). Given that the effects of father and mother risk may relate to father non-residence later in development, biological father not residing with the child at Y9 was controlled using a constructed dichotomous variable that indicated whether or not the biological parents lived together all or most of the time or 7 nights per week. Finally, mother–father *marital status* was controlled with one item at baseline (1 = *married*, 0 = *unmarried*).

Data analysis

We first calculated descriptive statistics for sample characteristics, individual risk items and risk composites using SPSS software. Next, we conducted bias analyses to determine if cases that were missing delinquency data differed from cases that were not missing data on demographic characteristics. Next, we calculated Pearson correlation coefficients for all continuous study variables. The SPSS multiple imputation function with 20 iterations was used to handle any missing data before estimating these bivariate associations.

Structural equation modeling (SEM) with AMOS software was used to test our model (see Figure 1). Three indices were used to assess fit: comparative fit index (CFI), root mean square error of approximation (RMSEA), and the Tucker–Lewis index (TLI). CFI,

Figure 1. Hypothesized SEM with mother, father, child and family cumulative risk at Y5; mediators at Y9; controls; and delinquent behavior at Y15.

RMSEA, and TLI were selected because they are the least affected by estimation technique and sample size under conditions of multivariate normality, especially with large sample sizes (Cangur & Ercan, 2015). Little (2013) provides the following guidelines for these indices (CFI: >.90 is acceptable; RMSEA: < .08 is acceptable; TLI > .95 indicates goodness of fit).

Multiple imputation was carried out on the SEM in AMOS. If a participant was missing any items in the cumulative risk composites (e.g., substance abuse item in the father risk composite) or observed variables (e.g., delinquent behavior), then the whole composite or observed variable was considered missing. See Appendix A for details, as well as frequencies for item-level missingness in the risk composites. Based on recommendations from Mazza et al. (2015), we applied multiple imputation and incorporated auxiliary variables to handle missing data at the variable level. We incorporated marital status and race/ethnicity as auxiliary variables based on their correlations with risk item missingness. This approach mitigates the loss in power due to missing items in composite and scale scores. Auxiliary variables (which can also serve as confounding variables) help to reduce measurement error in mediation analyses that include observed and latent variables (Fritz et al., 2016).

Because the delinquency variable was skewed (3.22) and highly kurtotic (15.38), we conducted bootstrapping, a nonparametric resampling procedure to generate the estimates (Streukens & Leroi-Werelds, 2016). Bootstrapping was conducted with 5,000 samples and a bias-corrected confidence interval of 95 in the SEM. Direct and indirect effects were calculated. We used the estimands command to estimate specific indirect effects (e.g., child risk → mother–child closeness → delinquent behavior). Effect sizes were calculated using squared multiple correlations. For example, the effect size of fathers' cumulative risk on delinquency was determined by subtracting the squared multiple correlation for delinquency when father risk was excluded from the analysis ($R^2_{excluded}$) from the squared multiple correlation with all risk variables (and other predictors) in the model ($R^2_{not\ excluded}$), divided by $1 - R^2_{not\ excluded}$.

Moderation analyses were conducted by first mean centering the risk composites (e.g., fathers' cumulative risk) and parenting variables (e.g., mother–child closeness) and then multiplying each risk composite times each parenting variable (e.g., mother risk X closeness). These interactions enabled us to examine whether the parenting variables protected youth from risk at ages 3 and 5. We examined five sets of possible protective effects. Each set included the four risk composites (father, mother, family, child). The first set examined their product with mother engagement at Y5. The next four sets examined father engagement at Y5, mother–child closeness at Y9, father–child closeness at Y9, and parental monitoring, respectively. Five SEMs were then fitted with each set of interaction terms. Finally, all significant interaction terms were then placed in a final model. Multi-group analysis was used to examine and compare the structural equation models for child sex at birth (boys and girls, moderation effects).

Because we conducted two sets of SEMs in this study (one set examining direct and indirect effects and one set examining moderation effects), we adjusted for familywise error using Bonferroni's correction by establishing an alpha level of .05 divided by 2 = .025.

Results

Descriptive analyses

Descriptive statistics for the risk composites indicated mothers reported an average of 1.01 risk factors and fathers reported 1.40 risk factors at Y3/5 (see Table 2). Youths were exposed to an average of 1.67 family-level risk factors. This was largely because nearly 50 percent of mothers reported household incomes below the poverty line and 56 percent of mothers and fathers did not reside together at Y5. The average delinquent behavior score was 1.40 (range = 0-39). As noted above, the data were skewed, with approximately 54.1 percent of youth indicating that they did not engage in any delinquent acts. Twenty-four percent of FFCW cases were missing delinquent behavior data. Data were more likely to be missing when mothers reported they are Hispanic and Other

Table 2. Correlation matrix, means, and standard deviations

		1	2	3	4	5	6	7	8	9	10	11
1. Delinquent behavior Y15	Pearson Correlation	1	.10	.15	.10	.10	−.01	−.08	−.06	−.09	−.06	−.19
	Sig. (2-tailed)		<.001	<.001	<.001	<.001	.627	<.001	<.001	<.001	<.001	<.001
2. Mother risk Y3/Y5	Pearson Correlation		1	.19	.18	.15	−.01	−.10	−.05	−.05	−.06	−.16
	Sig. (2-tailed)			.000	.000	.000	.661	<.001	.019	.006	.003	<.001
3. Father risk Y3/Y5	Pearson Correlation			1	.27	.17	.01	−.20	−.04	−.17	−.08	−.21
	Sig. (2-tailed)				.000	<.001	.618	<.001	.043	<.001	<.001	<.001
4. Family risk Y3/Y5	Pearson Correlation				1	.13	.03	−.28	−.05	−.20	−.06	−.18
	Sig. (2-tailed)					<.001	.283	<.001	.043	<.001	.012	<.001
5. Child risk Y3/Y5	Pearson Correlation					1	−.04	−.05	−.08	−.03	−.10	−.12
	Sig. (2-tailed)						.079	.049	.002	.344	<.001	<.001
6. M engagement Y5	Pearson Correlation						1	.10	.07	−.01	.05	−.03
	Sig. (2-tailed)							<.001	<.001	.721	.006	.150
7. F engagement Y5	Pearson Correlation							1	.03	.24	.03	.08
	Sig. (2-tailed)								.244	<.001	.124	.002
8. M-C closeness Y9	Pearson Correlation								1	.273	.38	.066
	Sig. (2-tailed)									<.001	<.001	.004
9. F-C closeness Y9	Pearson Correlation									1	.18	.100
	Sig. (2-tailed)										<.001	<.001
10. Monitoring Y9	Pearson Correlation										1	.087
	Sig. (2-tailed)											<.001
11. Self-control Y9	Pearson Correlation											1
	Sig. (2-tailed)											
	M	1.40	1.01	1.40	1.67	.71	37.20	25.69	12.98	11.18	11.07	26.57
	SD	2.48	1.03	1.30	1.17	.53	9.28	14.44	3.20	4.35	2.79	6.46

M = mother; F = father; C = child.

race/ethnicity versus Black and White: for delinquent behavior ($\chi^2[3] = 39.66$, $p < .001$), child risk ($\chi^2[3] = 64.30$, $p < .001$), father risk ($\chi^2[3] = 35.56$, $p < .001$), and family risk ($\chi^2[3] = 356.78$, $p < .001$), but not for mother risk ($\chi^2[3] = 5.23$, $p = .264$). These results indicate the data are not missing at random.

Bivariate analyses

Pearson correlation coefficients for associations among mother, father, child, and family cumulative risk composites ranged from .10 to .19 (see Table 2). The correlation between mother–child closeness and father–child closeness at Y9 was .27, $p < .001$. All risk composites at Y3/Y5 were significantly associated with delinquent behavior at Y15, with correlations ranging from .10 to .15, $ps < .001$. Mother–child closeness and father–child closeness were inversely associated with delinquent behavior, $r = -.06$ and $r = -.09$, $ps < .001$, respectively.

Multivariate analyses

Model testing
We tested a SEM that regressed delinquent behaviors at Y15 on father, mother, child, and family cumulative risk at Y3/Y5, mother and father engagement with child at Y5, Y9 variables (children's perceptions of their closeness with mothers and fathers, parental monitoring, and teacher perception of child self-control), and

control variables (mother's race/ethnicity, child sex at birth, marital status at birth, and biological father not residing with the child at Y9). Children's perceptions of their closeness with mothers and fathers at Y9, parental monitoring at Y9, and teacher perception of child self-control at Y9 were also regressed on father, mother, child, and family cumulative risk at Y3/Y5 (see Figure 1). There were no interaction terms in this model. This model produced an acceptable fit to the data, $\chi^2(df = 74) = 207.09$, $p < .001$; CFI = .99, TLI = .98; RMSEA = .021 (90% CI = .017–.024).

We then tested a SEM that included the same variables as in model 1, plus interaction effects (protective factors analysis). This model produced an acceptable fit to the data, $\chi^2(df = 151) = 747.75$, $p < .001$; CFI = .98, TLI = .96; RMSEA = .030 (90% CI = .027–.032).

Direct effects
Table 3 provides estimates (bias-corrected) for the model assessing direct linkages in the SEM with no interaction effects (test for H1). Y3/Y5 cumulative father risk ($\beta = .06$, $p < .001$; effect size = .01), Y3/5 mother risk ($\beta = .06$, $p = .001$; effect size = .01), and child risk ($\beta = .05$, $p = .001$; effect size = .011) were positively associated with Y15 delinquent behavior. Child self-control was the only Y9 variable associated with delinquency ($\beta = − .15$, $p < .001$; effect size = .02).

**Table 3.** Parameter estimates (bias-corrected) in the path analysis

Paths in the model			b	SE	BCBI β [lower, upper]	p
Delinquency Y15	←	M risk Y3/5	.10	.02	.06 [.02, .10]	.001
Delinquency Y15	←	F risk Y3/5	.14	.04	.06 [.03, .10]	***
Delinquency Y15	←	Fam risk Y3/5	.04	.06	.02 [−.03, .07]	.535
Delinquency Y15	←	C risk Y3/5	.18	.06	.05 [.01, .10]	.002
Delinquency Y15	←	M− C closenessY9	−.02	.02	−.02 [−.08, .03]	.297
Delinquency Y15	←	F− C closeness Y9	−.02	.01	−.03 [−.07, .01]	.067
Delinquency Y15	←	Monitoring Y9	−.01	.20	−.00 [−.08, .07]	.984
Delinquency Y15	←	M engagement Y5	−.00	.00	−.01 [−.05, .02]	.372
Delinquency Y15	←	F engagement Y5	−.01	.00	−.03 [−.06, .00]	.103
Delinquency Y15	←	Self− control Y9	−.07	.01	−.15 [−.19, −.11]	***
M− C closeness Y9	←	M risk Y3/5	−.04	.04	−.02 [−.05, −.01]	.295
M− C closeness Y9	←	F risk Y3/5	−.07	.05	−.03 [−.06, .01]	.168
M− C closeness Y9	←	Fam risk Y3/5	−.23	.06	−.08 [−.12, −.04]	***
M− C closeness Y9	←	C risk Y3/5	−.27	.07	−.06 [−.10, −.03]	***
M− C closeness Y9	←	M engagement Y5	.02	.01	.08 [.05, .10]	***
M− C closeness Y9	←	F engagement Y5	−.01	.00	−.02 [−.05, .01]	.214
F− C closeness Y9	←	M risk Y3/5	.14	.05	.05 [.02, .08]	.005
F− C closeness Y9	←	F risk Y3/5	−.39	.06	−.11 [−.14, −.08]	***
F− C closeness Y9	←	Fam risk Y3/5	−.52	.07	−.14 [−.18, −.08]	***
F− C closeness Y9	←	C risk Y3/5	−.05	.08	−.01 [−.03, .02]	.560
F− C closeness Y9	←	M engagement Y5	−.02	.01	−.04 [−.09, −.01]	.007
F− C closeness Y9	←	F engagement Y5	.08	.00	.29 [.26, .31]	***
Monitoring Y9	←	M risk Y3/5	.00	.01	.00 [−.05, .05]	.980
Monitoring Y9	←	F risk Y3/5	−.02	.01	−.06 [−.12, −.01]	.015
Monitoring Y9	←	Fam risk Y3/5	−.03	.01	−.07 [−.13, −.02]	.017
Monitoring Y9	←	C risk Y3/5	−.09	.01	−.16 [−.21, −.12]	***
Monitoring Y9	←	M engagement Y5	.00	.00	.08 [.04, .12]	***
Monitoring Y9	←	F engagement Y5	.00	.00	−.01 [−.05, .03]	.635
Self− control Y9	←	M risk Y3/5	−.15	.06	−.04 [−.05, .01]	.017
Self− control Y9	←	F risk Y3/5	−.66	.08	−.14 [−.17, − .11]	***
Self− control Y9	←	Fam risk Y3/5	−1.03	.09	−.20 [−.24, −.16]	***
Self− control Y9	←	C risk Y3/5	−.49	.11	−.07 [.− 10, −.03]	***
Self− control Y9	←	M engagement Y5	−.03	.01	−.06 [−.09, −.03]	***
Self− control Y9	←	F engagement Y5	−.01	.01	−.02 [−.06, .01]	.101
Total Indirect Effects						
Delinquency Y15	←	M risk Y3/5	.02	.01	.01 [00, .02]	.041
Delinquency Y15	←	Fam risk Y3/5	.03	.04	.01 [−.01, .04]	.109
Delinquency Y15	←	F risk Y3/5	.05	.01	.03 [.02, .03]	***
Delinquency Y15	←	C risk Y3/5	.04	.08	.02 [.00, .02]	.039

BCBI = Bias− corrected bootstrapped 95% confidence interval (b = 5,000); lower = lower boundary of the 95% confidence interval; upper = upper boundary of the 95% confidence interval. M = mother. Fam = family. F = father. C = child. Control variables include race/ethnicity (reference group for race/ethnicity is non− Hispanic Black), child sex at birth, marital status, and M − F coresidence at Y9. ***p < .001.

Indirect effects (mediation analyses)

Bias-corrected estimates for indirect effects are shown in Table 3 (test for H2). There was a significant total indirect effect of father cumulative risk on delinquent behavior. The estimands test showed that the positive association between father risk at Y3/Y5 and delinquent behavior at Y15 was significantly mediated by child
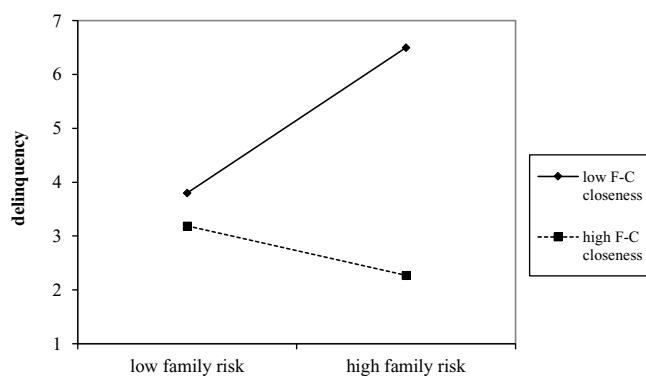
Figure 2. Graph showing moderation effect of father–child closeness on the association between family risk and delinquency. FC = father child.

self-control at Y9 ($\beta = .03$, $p < .001$). Specifically, father risk at Y3/Y5 was negatively associated with self-control, which in turn was negatively associated with delinquent behavior. There were no additional specific indirect effects in the model.

Protective factor analyses

Two moderation effects were found to be significant (test for H3). Children's perceptions of closeness to fathers at Y9 significantly moderated the association between family cumulative risk at Y3/Y5 and delinquent behavior ($b = -.065$, $p < .001$; the complete table including moderation analyses is available from the authors). Youth who reported feeling close to their fathers reported significantly fewer delinquent behaviors when family cumulative risk was high compared with youth who were not close to fathers (see Fig. 2).

Multiple group analysis (H4) revealed a significant child sex moderation effect on the association between child risk and delinquent behavior, $\chi^2\Delta = 4.85$, $p = .024$. Boys with higher levels of cumulative child risk at Y3/Y5 were more susceptible to delinquent behaviors than girls with higher level of cumulative child risk. There were no sex X risk moderations for father risk, $\chi^2\Delta = .04$, *ns*; mother risk, $\chi^2\Delta = .29$, *ns*; or family risk, $\chi^2\Delta = .32$, *ns*.

Discussion

National prevalence studies have shown that the majority of youth engage in at least 1 delinquent act (Snyder et al., 2003). Evidence from the FFCW data set are consistent with these findings. About 59% of 15-year-olds reported at least 1 delinquent behavior (range was from 0 to 27 delinquent behaviors). A growing body of research has examined multiple sources of cumulative risk (e.g., caregiver risk, child risk, Trentacosta et al., 2013) in relation to adolescent delinquent behavior, but few studies have included assessments of fathers' cumulative risk *in addition to* mothers', children's and family risk (e.g., Simmons et al., 2018; Swisher & Roettger, 2012; Yan et al., 2021). This is important because children's behaviors are influenced by myriad factors, among the most critical are child, mother, father, and family. Our study suggests that excluding fathers is an important gap in delinquency research. The results of the SEM showed that father's cumulative risk during early childhood, as well as mothers' and children's risk, were significantly and positively associated with youth reports of delinquent behavior (main effects). Our findings have important implications for researchers examining predictors of adolescent

delinquency. Specifically, research that omits fathers' risk may not obtain a full picture of predictors of delinquency.

Child and mother cumulative risk at ages 3–5 were significantly and directly associated with youth delinquent behavior. Many studies have found that higher levels of cumulative mothers' risk predicts delinquent behavior during adolescence (e.g., Deater-Deckard et al., 1998; Miller et al., 2021). It is also now well established that early child developmental risk factors predict youth delinquent behavior (e.g., Staff et al., 2015). These child risk factors may be manifestations of neuropsychological deficits in early childhood (Moffitt, 2005). Studies indicate that children with these developmental deficits are also at increased risk for delinquency when they are exposed to high levels of disadvantage in the home environment (Staff et al., 2015). The current study extends the findings of previous researchers by showing the combination of cumulative child, father, and mother risk in early childhood increase the likelihood of youth delinquency. Early intervention with children, fathers, and mothers who show evidence of cumulative risk may be important for programs aiming to prevent and reduce the occurrence of youth delinquency.

Based on the transactional model, we hypothesized that child self-control at age 9 would mediate the association between fathers', mothers', and family cumulative risk and delinquent behavior, and parental monitoring at age 9 and lower levels of father–child and mother–child relationship closeness would mediate the association between child risk at ages 3–5 and delinquent behavior. Although we did not find support for parental monitoring or parent–child relationship closeness as mediators of the association between early child cumulative risk and adolescent delinquent behavior, child self-control at age 9 mediated the association fathers' cumulative risk and delinquent behavior. This is a new finding showing that the pathways through which father risk influences children are through the child himself/herself. One alternate possible explanation, however, is that fathers and children are both at risk for delinquent behavior due to shared genetic influences (Azeredo et al., 2019). We did not find support for father–child or mother–child closeness as mediators of the association between early child risk and delinquent behavior. It is noteworthy that child risk was significantly related to mother–child but not father–child closeness, but neither mother–child nor father–child closeness was related to delinquency. Researchers have suggested that father–child relationships have a special quality that is different from mother–child relationships (Grossmann et al., 2008). Specifically, fathers offer security to young children in situations that are challenging and stimulating (Grossman et al., 2008). Many fathers like to stimulate children through "rough and tumble" play. This type of play is very enjoyable to young children but can also become overwhelming when the child is overstimulated (Pellegrini, 2002). Conceivably, fathers' engagement in supportive play might help children who are at high risk to inhibit their behaviors (i.e., fathers model social control), which may result in children engaging in less delinquent behavior as adolescents. Fathers' engagement in play during early and middle childhood would be a fruitful area for future research on mediators of the association between child risk and delinquent behavior.

The finding that parental monitoring at age 9 did not mediate the associations between cumulative child risk and delinquent behavior may be due to the age when monitoring was assessed. Parents tend to take a more active role in monitoring when children approach adolescence (e.g., digital behavior, Anderson, 2016). Parental monitoring may become more important for

predicting delinquent behavior during the adolescent years (Racz & McMahon, 2011). Many studies have found that consistent and supportive parental monitoring during adolescence is associated with lower delinquency (for review Racz & McMahon, 2011).

We found limited support for our hypothesis that child sex at birth would moderate the associations among cumulative risk variables and delinquent behavior: boys with higher levels of child-level risk at ages 3–5 were significantly more likely to report delinquent behavior than girls with higher levels of risk. This is consistent with literature pointing to boys' particular vulnerability to delinquency (Leban, 2021; Gauthier-Duchesne et al., 2022). Father–child relationship closeness at age 9 significantly moderated the association between early family cumulative risk and delinquent behavior. These findings are important because they highlight the importance of fathers' positive parenting as protective against the negative effects that family risk can have on children's social adaptation. The challenge is to be able to intervene so that cumulative family risk does not negatively impact fathering, as it typically tends to do.

The lack of significant moderation effect of mother–child closeness at age 9 on the association between any cumulative risk variables during early childhood and adolescent delinquent behavior may be explained by Lerner and Bornstein's (2021) specificity principle, which states that specific child outcomes involve "coaction of specific individuals at specific times in specific places through specific processes." The father–child relationship might be particularly important during middle childhood in protecting children from the negative effects of early risk on later delinquency because of the uniqueness of father–child relationships compared with mother–child relationships (e.g., McDowell et al., 2002). Fathers may have an inhibitory effect on delinquency because they are more sensitive to early warning signs given their own exposures and experiences or because they provide a sense of safety and security.

Limitations

A limitation of the current study is that other potentially significant sources of risk (e.g., peer, school) are not included as predictors of delinquency. The measure of children's perceptions of parent–child closeness has been widely used in research (Bandy & Moore, 2009), but it has not been validated with low-income children. The measure of parental monitoring was only administered to primary caregivers (mostly mothers). There were also limitations with the measures of child self-control. Specifically, teacher assessments like other self-report measures are susceptible to systematic bias. There was also potential race bias in the risk indices. For example, the father and mother risk item, "charged with breaking the law," as an indicator of criminal justice involvement may be biased against families of color. Moreover, being charged with breaking the law does not mean being convicted of a crime or incarcerated (these variables were not available in all waves of data collection). Although convictions and incarcerations are also race-biased, they are stronger risk factors than being charged with breaking the law. The measures of father and mother engagement at age 5 are counts of the number of days parents are involved with children, which may be confounded by some of our risk items (e.g., biological father does not reside with child, unemployment).

There was substantial missing data especially for fathers. Bias analyses showed that the study variables (and items within the risk composites) were more likely to be missing among Hispanic, Other, and unmarried parents at baseline. The current study may

therefore be more applicable to parents who were married at baseline and Black and non-Hispanic White families and children. Although our study has the strength of longitudinal design spanning early childhood to adolescence, it is limited in the inclusion of repeat measures. A period of 10 years separated the measures of cumulative risk and youth delinquent behavior, and mediating variables were measured only in middle childhood. More proximal assessments of risk and delinquent behavior may produce larger effects. It is nonetheless significant that father, mother, and child risk measured during early childhood (at ages 3–5) were longitudinally associated with adolescent delinquent behavior. Another limitation of the study is that it assumes a family structure with a mother and father and thus, is not inclusive of same sex co-parents.

Conclusions

A significant contribution of the current study is the inclusion of father-level risk, not just mother, family, and child risk, in the association between risk and delinquency, as is typically done in the literature. Our findings indicate that it is important to assess father, as well as mother, family, and child risk, during early childhood because they each significantly predict adolescent delinquent behavior in multivariate analyses. Importantly, fathers who have closer relationships with children during middle childhood protect them against the negative effects of family risk on delinquent behavior. Another significant finding was that the pathway through which higher father risk was associated with delinquency was through lower levels of child self-control at age 9.

It is important for policy makers and programs serving children and families to identify which levels of risk in the family system are associated with delinquent behaviors. Our findings indicate that low-income fathers (as well as mothers and children) should be included in interventions aimed at preventing risk for delinquency. These interventions should acknowledge that many low-income fathers have positive relationships with their children and that these need to be encouraged and supported so that they can protect children from the negative effects of risk on their behaviors. Programs that target mothers at the exclusion of fathers, for example, may be less effective at preventing juvenile delinquency than programs that include both parents as well as children. Also, programs that ignore child risk may be less effective than those that consider it when formulating parenting programs and curricula. These findings highlight the importance of addressing risk as early as possible to reduce the odds that children will engage in delinquent behaviors and potentially become involved in the justice system.

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Appendix A. Risk item descriptives, missing data and associations with auxiliary variables

Risk variable	*n*	%	*n* missing	% missing	Marital status χ^2	Race/eth. χ^2
F depression	530	12.5	1,659	39.0	155.52***	46.30***
F drug abuse	672	15.8	2,078	48.8	189.19***	82.43***
F poor health	380	8.9	1,661	39/0	152.73***	45.73***
F criminal charges	529	12.4	1,664	39.1	155.78***	48.12***
F low education	1,396	32.8	151	3.5	183.64***	15.91***
F unemployed	579	13.6	0	0		
M depression	1,034	24.3	583	13.7	4.60*	9.45*
M drug abuse	369	8.7	566	13.3	6.08*	11.65**
M poor health	779	18.3	579	13.6	5.57*	9.58*
M criminal charges	381	9.0	582	13.7	6.42*	9.08*
M low education	1,442	33.9	5	.1	1.64	5.01
M unemployed	1,223	28.7	0	0		
Fam poverty	1,934	45.5	566	13.3	6.08*	11.65**
Fam instability	705	16.6	0	0		
Fam absent bio. F	2,179	51.2	569	13.4	6.44*	11.05**
Fam multiple moves	917	21.6	917	13.4	6.44*	11.67**
Fam IPV	143	3.4	806	18.9	36.67***	12.85**
C speech/language	258	6.1	0	0		
C poor health	106	2.5	651	15.3	16.01***	8.74*
C attention	176	2.5	2,151	50.6	.65	38.03***
C anxious/depress.	142	3.4	2,163	50.8	.53	50.31***
C withdrawn/depress.	142	3.3	2,163	50.8	.53	50.31***
C aggression	150	3.5	2,235	52.5	.08	40.98***

*$p < .05$. **$p < .01$. ***$p < .001$.
Notes. F = father. M = mother. Fam = family. C = child. Bio = biological. Depress = depressed.