



# Paternal Incarceration, Family Relationships, and Adolescents' Internalizing and Externalizing Problem Behaviors

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## Abstract

Little is known about the conditions under which paternal incarceration is harmful to children and the mechanisms that explain this. This study addressed the family relationship context in the associations between paternal incarceration and adolescents' internalizing and externalizing problem behaviors. Using data from the Future of Families and Child Wellbeing Study, a moderated mediation model was specified where paternal incarceration predicted adolescents' internalizing and externalizing problem behaviors through family relationship quality, and where the mediating role of family relationship quality was moderated by pre-incarceration family relationship characteristics. Using latent profile analyses, three pre-incarceration family clusters were identified ("Cohesive"; "Fragmented"; "Disharmonious"). Analyses indicated that the association between paternal incarceration and family relationship quality differed across pre-incarceration family clusters and that decreased father-mother relationship quality mediated the negative association between paternal incarceration and adolescents' internalizing and externalizing problem behaviors among "Cohesive" and "Fragmented", but not among "Disharmonious" family clusters. The findings suggest that adolescents with more harmonious pre-incarceration family relationships are most vulnerable to the negative consequences of paternal incarceration. The study demonstrates the need to consider the family relationship context to understand the intergenerational consequences of incarceration.

**Keywords** Criminal justice and incarceration · Adolescent risk behaviors · Family relationships · Parent–child relationships · Fathers and fatherhood

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The United States has the highest proportion of children experiencing parental imprisonment in the world, with an estimated one in fourteen children having experienced imprisonment of a residential parent (Murphey & Cooper, 2015). As the majority (93%) of the imprisoned population is male (Glaze & Maruschak, 2010), many more children experience paternal than maternal incarceration. Much evidence has linked paternal incarceration to a variety of emotional and behavioral problems among children and adolescents (for recent overviews of the literature, see Arditti & Johnson, 2022; Poehlmann-Tynan & Turney, 2021). However, the impact of paternal incarceration is more deleterious for some children than for others (Turney, 2017). Little is known about the conditions under which paternal incarceration is harmful to children and the mechanisms that explain this.

Researchers have argued that the consequences of paternal incarceration for child and adolescent developmental outcomes are shaped by the family relationship context in which incarceration occurs (Arditti, 2016; Poehlmann-Tynan & Arditti, 2018). Disruption of parent–child bonds and reduction in the quality of care are considered key mechanisms in the link between parental incarceration and child and adolescent well-being (Murray & Farrington, 2008). As positive family relationships are thought to be key for the well-being and resilience of children and adolescents (Wright et al., 2013), we argue that the role of family relationships needs to be addressed in order to understand the conditions under which and why paternal incarceration is harmful to children and families. Although the ways in which paternal incarceration affects families are thought to depend strongly on family relationship characteristics prior to incarceration (Turanovic et al., 2012), few studies have quantitatively examined this issue. Identifying mechanisms through which parental incarceration is consequential for children and identifying subgroups of children for whom parental incarceration is most impactful is a key step forward in understanding the intergenerational consequences of parental incarceration.

Scholars have recently called for methodological innovations in the parental incarceration literature that examine families as the primary unit of analysis, use latent class models to account for family heterogeneity, and test moderated mediation models to better understand the contexts in which children and families cope or thrive in these circumstances (Arditti & Johnson, 2022). This study addresses this call in two ways. First, we examined whether the family relationship quality of different dyads within the family (father–child, mother–child, and father–mother relationship quality) in middle childhood mediated the link between paternal incarceration in childhood and internalizing problem behaviors and externalizing problem behaviors in adolescence. As such, we move beyond dyadic relationships and address multiple relationships within a family. Second, we examined whether the mediation effect was moderated by pre-incarceration family relationship characteristics in early childhood. This study is novel in that it incorporates adolescent problem behaviors and family measures from before paternal incarceration and tests the role of family relationship quality as a mechanism in a single statistical model. This improves the comprehensive understanding of the role of family relationships before and after incarceration. Our paper contributes to the literature by demonstrating that the family relationship context provides an explanation of why the consequences of paternal incarceration are not the same for all children and adolescents.

Understanding the impact of paternal incarceration on adolescents' behaviors is particularly important as adolescence is a time when emotional and behavioral problems often manifest.

We used longitudinal data from the Future of Families and Child Wellbeing Study (FFCWS). The FFCWS includes mostly unmarried parents of children born between 1998 and 2000 in urban areas in the United States and follows the families from the child's birth to adolescence. The survey includes a relatively large number of ever-incarcerated fathers. The FFCWS provides a unique opportunity to study how family characteristics before incarceration influence the effects of paternal incarceration on adolescents' outcomes. To address the objectives of the study, we developed a typology (latent profiles) of family relationships before paternal incarceration took place. We then carried out a moderated mediation analysis to explore whether father-child, mother-child, and father-mother relationship quality mediated the impact of paternal incarceration on adolescents' internalizing and externalizing problem behaviors and whether this mediation effect differed by pre-incarceration family typologies.

## Background

### Effects of Paternal Incarceration on Adolescents' Internalizing and Externalizing Problem Behaviors

Research has shown a consistent association between parental incarceration and externalizing problem behaviors for both children and adolescents (Poehlmann-Tynan & Turney, 2021). The evidence regarding internalizing problems is less clear. It has been argued that "heterogeneity in the outcomes of children with incarcerated parents is the rule rather than the exception" (Poehlmann-Tynan & Arditto, 2018, p. 55). Paternal incarceration was found to be most harmful among children who are least likely to experience paternal incarceration (Turney, 2017). If the impact of paternal imprisonment differs across children's chances of experiencing paternal incarceration, it is misleading to examine the average effects of paternal incarceration on children's and adolescents' outcomes, as these effects overlook the heterogeneity of children's and adolescents' experiences. While it is thought that paternal incarceration is most harmful to children who are likely to experience the most dramatic changes in family life resulting from parental incarceration (Turney, 2017), researchers have not identified substantively and practically meaningful groups of families for whom paternal incarceration is most or least harmful.

Overall, the available evidence suggests that the effect of paternal incarceration on adolescents' problem behaviors depends on various markers of pre-incarceration family characteristics. To illustrate, the negative impact of paternal incarceration on children's outcomes has been found to be stronger when children co-resided with their fathers before imprisonment (Geller et al., 2012). However, the removal of a substance-abusing or violent father from the household due to paternal incarceration may exert a positive influence on children's behavioral outcomes (Wakefield & Powell, 2016; Wildeman, 2010). The negative consequences appear to be mainly concentrated among children and adolescents with higher-quality family relationships

before incarceration. However, other researchers have argued that paternal incarceration is often concentrated in families facing a variety of pre-existing family-related risk factors (e.g., financial hardship, family violence, problematic parenting behaviors, household conflict, parental substance use problems) that are also likely to correlate with family relationship quality, making it difficult to tease out the independent influence of paternal incarceration on family relationships and adolescent outcomes over and above broader family-related risks (Giordano et al., 2019; Ng et al., 2013).

## Paternal Incarceration and Family Relationships

We draw from family stress and family systems theory to understand the impact of paternal incarceration on families. From a family stress perspective, paternal incarceration is viewed as an ongoing source of stress that has social, economic, and psychological consequences on the family level (Lavee, 2013; see Arditti, 2016 for an application of family stress theory on parental incarceration). The stresses associated with paternal incarceration impact families' day-to-day interactions, relationship quality, and children's behaviors. How families respond to these stressors is shaped by families' resources for dealing with crises and the definition that families make of the stressors (Lavee, 2013). Family systems theory—a theoretical framework not often used in the literature on parental incarceration—emphasizes that family members within a family are interconnected and interdependent (Cox & Paley, 2003) and shifts the attention to the impact of paternal incarceration from the individual to the functioning of a family as a whole. A stressor like paternal incarceration is expected to lead to disruptions in the functioning of the entire family unit and the roles enacted within it. According to family systems theory, paternal incarceration is expected to have ripple effects on the actors within the family system, their relationships, and the family system as a whole. In the following section, we discuss the empirical evidence on the association between paternal incarceration and the three primary subsystems within the family system included in our study: father-child relationships, mother-child relationships, and father-mother relationships.

First, paternal incarceration has been found to affect the subsystem of father-child relationships. During incarceration, fathers are physically separated from their children and have limited options for meaningful and developmentally promotive father-child contact (Dennison et al., 2017). Imprisonment can disrupt fathers' paternal role (Arditti et al., 2005). After release, paternal incarceration decreases the chances of fathers' co-residence, contact, and engagement with their children (Geller, 2013; Turney & Wildeman, 2013). The second subsystem of the broader family system concerns mother-child relationships. Some researchers have suggested that mother-child relationships are affected by paternal incarceration (Arditti et al., 2003), although direct evidence is limited. One study found that women who experienced family member imprisonment and subsequently experienced increased parenting stress reported lower mother-child relationship satisfaction (Besemer & Dennison, 2018). Another study found that parental incarceration was associated with increased primary caregiver depression, which in turn was

associated with decreased caregiver-child relationship quality (Bradshaw et al., 2021). Among parents who lived together before incarceration, paternal incarceration has been associated with increased maternal neglect and physical aggression (Turney, 2014). Another study, however, found weak and inconsistent effects of paternal incarceration on mothers' parenting behaviors and parenting stress (Turney & Wildeman, 2013), suggesting no discernible effect. Together, these findings suggest that mother-child relationships can be harmed by paternal incarceration, but the evidence is inconclusive. Third, paternal incarceration may negatively influence the subsystem of father-mother relationships. Incarceration has been associated with union dissolution (Fallesen & Andersen, 2017), decreased parental relationship quality (Turney, 2015), lower degrees of fathers' cooperation with mothers in parenting, and mothers' increased probability of re-partnering (Turney & Wildeman, 2013). The limited options for intimate communication and the costs of contact can stress romantic relationships during incarceration (Braman, 2007). Overall, the empirical evidence suggests a negative impact of paternal incarceration on parental relationships.

A limitation of the literature on the impact of paternal incarceration on family relationship outcomes is that studies have largely focused on dyadic relationships within the family. Family systems theory emphasizes the importance of considering the family as the unit of analysis. Therefore, the focus of our study is on three measures of dyadic relationship quality within the family (father-child, mother-child, and father-mother relationship quality) rather than focusing on one dyadic relationship.

### **Pre-Incarceration Family Characteristics**

Family stress theory outlines that families' responses to stressors depend on pre-existing strains present and adaptive resources available in the family before the stressor event (Arditti, 2016; Lavee, 2013). How family relationships are affected by paternal incarceration is therefore likely to depend on pre-incarceration relationship characteristics. Pre-incarceration family relationships have been found to play a central role in determining whether father-child relationships deteriorate, improve, or remain stable in the context of paternal incarceration (Venema et al., 2022). While paternal incarceration can disrupt father-child relationships when an important attachment figure is removed from the child's life, the incarceration of an uninvolved father is likely to be less detrimental to the relationship (Turanovic et al., 2012). In line with this, paternal incarceration has been found to decrease father involvement and father-child relationship quality among residential fathers, but not among non-residential fathers (Turney & Marín, 2022; Turney & Wildeman, 2013). The same principle holds for the impact of paternal incarceration on father-mother relationships. In families where pre-incarceration relationships were positive, feelings of loss can be strong during the incarceration period (Turanovic et al., 2012). In cases of addiction or abuse, however, paternal incarceration can positively affect parental relationships (Turanovic et al., 2012; Turney, 2015). Changes in maternal parenting stress following paternal incarceration have been found to depend on pre-incarceration family characteristics, levels of adversity, and well-being (Dennison et al.,

2020). Although the available research has identified important pre-incarceration family factors that moderate the impact of paternal incarceration on family relationship outcomes, these factors are typically studied in isolation. In this study, we use latent profile analysis to model and capture the (unobserved) heterogeneity of the pre-incarceration family context.

### **The Role of Family Relationships in the Effects of Paternal Incarceration on Adolescents' Internalizing and Externalizing Problem Behaviors**

On the one hand, high-quality family relationships may foster children's and adolescents' resilience in adverse situations, and provide a buffer from the harmful consequences of paternal incarceration. As stated by Wright and colleagues: "[o]ne finding that has emerged and been reconfirmed time and time again is that [children's] resilient adaptation rests on good family (or surrogate family) relationships" (Wright et al., 2013, p. 20). On the other hand, children and adolescents from more harmonious and stable families may be more vulnerable to experiencing damaged relationship quality when facing paternal incarceration, which may lead to increased internalizing and externalizing problem behaviors. Several studies suggested that markers of damaged family relationships (e.g., maternal depression, maternal stress, ineffective parenting, decreased father engagement, and decreased father attachment) mediated the harmful effects of parental incarceration on child outcomes (Antle et al., 2019; Bradshaw et al., 2021; Dwyer Emory, 2018). If paternal incarceration is more harmful to family relationships among families with more harmonious pre-incarceration family characteristics, and if reduced family relationship quality mediates the effect of paternal incarceration on children's internalizing and externalizing problem behaviors, then this implies that children and adolescents from families with more harmonious families are especially vulnerable to the negative impacts of paternal incarceration on internalizing and externalizing problem behaviors. This study adds to the literature by testing this hypothesis in a single statistical moderated mediation model.

#### **Current Study**

In this study, we compared children who experienced paternal incarceration after age 3 up until age 9 with children who did not. We examined differences between the two groups on family characteristics at age 3 before paternal incarceration, family relationship quality at age 9, and internalizing and externalizing problem behaviors at age 15 to establish temporal ordering. We chose to measure internalizing and externalizing problem behaviors at age 15 to examine how the longer-term consequences of parental incarceration in childhood affect the longer term. Figure 1 provides a conceptual model of the study.

This study contributes to the literature on parental incarceration in three ways. First, we examine the role of family relationship quality as a mechanism in the association between paternal incarceration and outcomes in adolescence, deepening the understanding of the family processes that account for the intergenerational

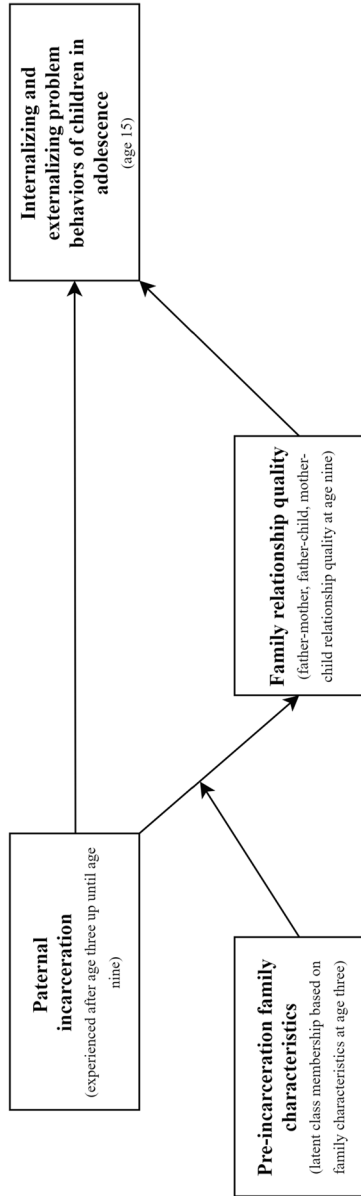


Fig. 1 Conceptual model

impact of paternal incarceration. Second, we examine the extent to which the mechanism of damaged family relationships depends on pre-incarceration family characteristics. We do so by providing a comprehensive measure of interrelated pre-incarceration family characteristics by using latent profile analysis and going beyond relatively crude measures (e.g., fathers' residential status) used in earlier research. As such, we add to the literature on the heterogeneous effects of parental incarceration by developing conceptually meaningful subgroups of families for which the consequences of parental incarceration for families and the mechanisms that account for these consequences differ. Third, inspired by family systems theory, we include multiple family subsystems (father-child, mother-child, and father-mother relationships) into a single analytical model, allowing for a family-level view of the impact of paternal incarceration on family relationships.

## Methods

### Data

The Future of Families and Child Wellbeing Study (FFCWS) is a longitudinal birth cohort study that follows 4898 focal children (born in 1998–2000) and their parents from 20 large cities in the United States (population > 200,000). The FFCWS sample is nationally representative of non-marital births in cities with populations over 200,000 (Reichman et al., 2001). The baseline interviews were conducted face-to-face with mothers in the hospital within 48 h after the birth of the focal child (response rate, 86%). Families were interviewed again when the focal child was approximately 1 ( $N=4457$ ), 3 ( $N=4365$ ), 5 ( $N=4295$ ), 9 ( $N=3813$ ), and 15 years old ( $N=3595$ , 73% of the baseline sample), mostly using a combination of telephone and at-home interviews. Children were also interviewed at ages 9 and 15 ( $N=3377$  at the 9-year survey;  $N=3444$  at the 15-year survey). Fathers were interviewed up until the 9-year survey, but attrition rates were higher. Consistent with other studies (e.g., Turney & Wildeman, 2013), we rely mainly on mothers' and children's reports to avoid issues with fathers' attrition rates. Detailed information on the FFCWS is available here: <https://ffcws.princeton.edu/documentation>.

### Sample Selection

We selected 2867 families who participated in all survey waves of interest: the mother-survey at age 3, the child and caregiver survey at age 9, and the caregiver survey at age 15. To obtain measures on pre-incarceration family characteristics, 223 observations where the father was incarcerated at the time of the year three survey were excluded, leaving 2644 families. This step was necessary as our measure of paternal incarceration ranges from after the year-3 survey up until the year-9 survey (described below). Fathers who were incarcerated at the time of the year-3 survey were dropped from the analytic sample to ensure that the measures on pre-incarceration family characteristics referred to non-incarcerated fathers.



We also excluded 77 cases in which the father or child had passed away, leaving an analytic sample of 2567 cases. See Fig. 2 for a flow chart of the sample selection.

The analytic sample differed from the total baseline sample on various sociodemographic characteristics. Families in the analytic sample on average had higher levels of educational attainment measured at the baseline survey (29.3% of mothers had less than high school education) than those who were not included in the analytic sample (40.5% of mothers had less than high school education). Families in our analytic sample were more likely to be White (20.2% of fathers) compared to the baseline sample (16.1% of fathers). These differences were likely attributable to non-random study attrition.

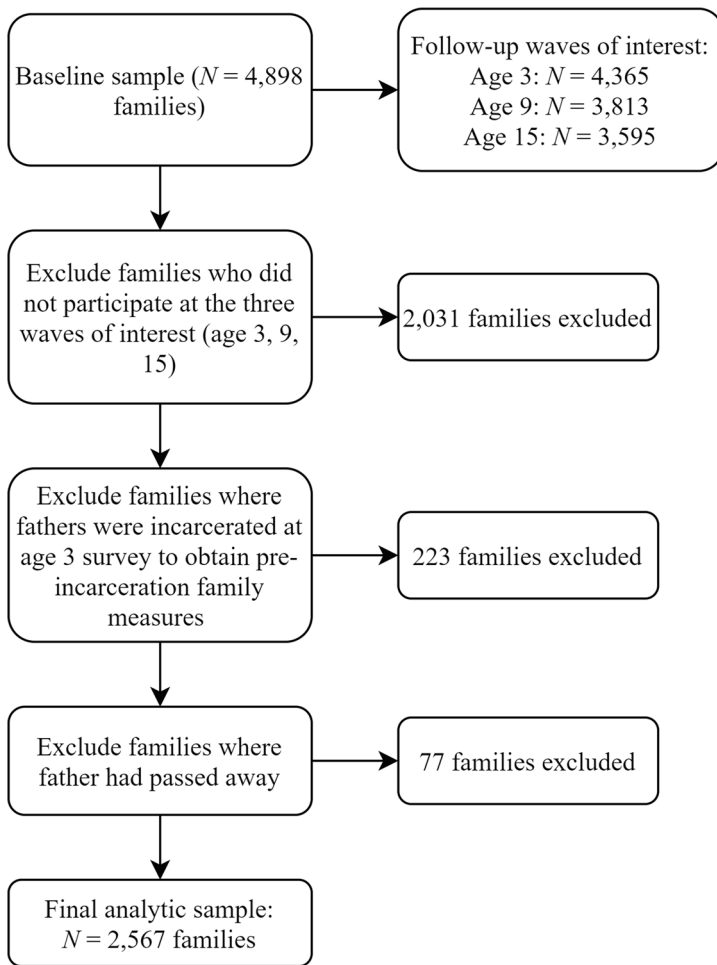


Fig. 2 Flow chart of sample selection

## Description of Measures

### Internalizing and Externalizing Problem Behaviors at Age 15

Internalizing and externalizing problem behaviors were assessed using the Child Behavior Checklist (Achenbach, 1991) at age 15, which were reported by the adolescents' primary caregiver (in 90.5% of the cases, this was the adolescent's biological mother). Caregivers assessed the extent to which various statements applied to their child (0 = *not true*, 1 = *sometimes true*, 2 = *often true*). Examples of statements in the internalizing subscale are "[adolescent] is too fearful or anxious" and "[adolescent] is unhappy, sad or depressed", and examples of the externalizing subscale included "[adolescent] destroys things belonging to the family or others" and "[adolescent] argues a lot". The item scores were averaged to create a composite score for internalizing (8 items,  $\alpha = 0.79$ ) and externalizing problem behaviors (20 items,  $\alpha = 0.88$ ).

### Paternal Incarceration

The main independent variable in this study is a binary variable indicating whether adolescents experienced paternal incarceration of their biological father during childhood after age 3 up until age 9. A unique strength of the FFCWS is the ability to rely on multiple informants to identify paternal incarceration. We captured paternal incarceration using various items that indicated whether the child's biological father was incarcerated. First, we used information on whether fathers or mothers reported that the father was incarcerated at the time of the 5-year survey or 9-year survey ("is father currently in jail?"). Second, we used information on mothers' reports of paternal incarceration between the 3- and 9-year survey ("has father spent any time in jail since the last interview?"). Third, information on paternal incarceration was based on indirect reports (e.g., mothers reporting fathers' incarceration as the reason why the father was separated from the child) and on information recorded by the survey subcontractors during the data collection. We considered fathers to be incarcerated if any measure indicated paternal incarceration (Geller et al., 2011).

### Family Relationship Quality at Age 9

The mediating variables in this study are father-child, mother-child, and father-mother relationship quality at age 9. Note that we focus on the child's biological parents for all variables relating to family relationships and characteristics in the study. Father-child and mother-child relationship quality were each measured with two child-reported items. The first item assessed how close the child felt to the biological father/mother (1 = *not very close* to 4 = *extremely close*), and the second item assessed how well the child and their biological father/mother share ideas or talk about things that matter (1 = *not very well* to 4 = *extremely well*). The second item was coded as "*not very well*" when the child had not seen or talked to the father/mother in the last month. We averaged scores of both items to create a composite item for father-child relationships ( $r = 0.71$ ) and mother-child relationships

( $r=0.34$ ). Father-mother relationship quality was assessed with one mother-reported item from the 9-year survey: “In general, would you say that your relationship with father is excellent, very good, good, fair, or poor?”. The variable was coded so that a higher score reflected higher father-mother relationship quality (1 = *poor* to 5 = *excellent*).

### Family Characteristics at Age 3 (Pre-incarceration)

We used mother-reported data on family relationship quality from the 3-year survey as a measure of pre-incarceration family characteristics for those who experienced paternal incarceration after the 3-year survey and before or at the 9-year survey. To provide a comprehensive measure of pre-incarceration family characteristics, we included eight variables, all derived from the 3-year survey: (1) a binary variable indicating whether father and mother were in a romantic relationship; (2) a binary variable indicating father-mother co-residence (which in 99.7% of cases also implied father-child co-residence); (3) one item indicating mother-father relationship quality (1 = *poor* to 5 = *excellent*); (4) a composite score of father engagement with child (13 items,  $\alpha=0.94$ ), including measures of how many days a week father sings songs or nursery rhymes, plays imaginary games, and plays outside with the child (items were coded as 0 when father did not have any contact with the child in the past year); (5) a composite score of 13 items measuring mother engagement with child ( $\alpha=0.66$ , same items as father engagement); (6) a composite score of 6 items measuring father-mother co-parenting relationship ( $\alpha=0.94$ ), including items such as “when father is with child, he acts like the father you want for your child” (1 = *never* to 4 = *always*); (7) one item measuring the frequency of father-mother arguments (1 = *never* to 5 = *always*); and (8) one item measuring the degree to which mother trusts father to take care for child for 1 week (1 = *not at all* to 3 = *very much*).

### Control Variables

Several control variables were included in the analyses that may affect the associations between paternal incarceration, family relationship quality, and adolescent problem behaviors. *Paternal problematic substance use* was measured by using the mother’s reports of whether the father had problems with keeping a job or maintaining social relationships because of drugs or alcohol use at the baseline, 1- or 3-year survey. *Domestic violence* was indicated when the mother reported ever being slapped or kicked by the child’s father at the 3-year survey. *Father impulsivity* was measured using a father-reported six-item scale at the 1-year survey (e.g., “I will often say whatever comes into my head without thinking first”, and “Often, I don’t spend enough time thinking over a situation before I act”; based on Dickman, 1990) ( $\alpha=0.83$ ). *Material hardship* was measured by calculating the sum of eight mother-reported binary items indicating whether mother encountered any issues in the past 12 months because there was not enough money (e.g., received free food or meals, did not pay full rent or mortgage payments, was evicted from home) at the 3-year survey. A dummy variable indicating

*parental depression* measured whether the father or mother met the criteria for depression at the 1 or 3-year survey as measured by the Composite International Diagnostic Instrument-Short Form (CIDI-SF; Kessler et al., 1998). We also controlled for the *mother's educational attainment*, whether the *father is Black*, and the *child's sex*, all measured in the baseline study. Further, we included controls for children's *internalizing and externalizing behaviors at age 3* as reported by mothers.

Finally, we added several variables to the model to better isolate the role of paternal incarceration during childhood and the quality of family relationship quality and to provide a more rigorous test. These variables included (1) *prior paternal incarceration*, which indicated whether the father had ever been incarcerated up until age 3 (including before the focal child's birth), as reported by the mother, father, or interviewer at the 3-year survey; (2) *future paternal incarceration*, which indicated whether the adolescent experienced paternal incarceration at the 9-year survey, between the 9- and 15-year surveys, or at the time of the 15-year survey as reported by father or mother; (3) *maternal incarceration*, which indicated whether the father or mother reported that the mother had ever been incarcerated in her lifetime, measured across all available survey waves; (4) *father-child co-residence status*, measured at the 9-year survey, and 5) *father-mother relationship status*, measured at the 9-year survey.

## Analytic Strategy

The analyses were carried out in two steps. First, we used latent profile analysis to identify latent subgroups of people with similar family relationship characteristics at age 3 (Collins & Lanza, 2009). Latent profile analysis is well-suited for this study for two reasons. First, it allows us to identify meaningful subgroups to capture the (unobserved) heterogeneity of family characteristics in the sample based on a variety of highly correlated indicators. Second, it allows us to reduce complexity. Using many individual indicators as moderators would result in a very complex model. Instead, latent cluster analysis provides meaningful subgroups that facilitate the interpretation of the effects within each subgroup. We estimated six classes and selected the optimal number of classes based on (a) Bayesian Information Criterion (BIC), with lower values indicating closer model fit; (b) Lo–Mendell–Rubin (LMR) test, Vuong–Lo–Mendell–Rubin (VLMR) likelihood ratio test, and Bootstrapped Likelihood Ratio (BLRT) test (with significant *p*-values indicating that adding one class to the model improves model fit); (c) entropy (with values closer to 1 indicating more accurate classification of observations to classes); and (d) substantive meaning and theoretical relevance. Cases were assigned to the family relationship class based on the highest class membership probability. Missing data were handled using full information maximum likelihood (FIML).

In the second step, we estimated a moderated mediation path model. In the model, the impact of paternal incarceration on adolescents' internalizing and externalizing problem behaviors is mediated by family relationship quality, and the

impact of paternal incarceration on family relationship quality is moderated by pre-incarceration family characteristics. All paths controlled for the covariates described in the previous section. All dependent variables were standardized to facilitate the interpretation of effect sizes. Model fit was assessed with the  $\chi^2$ -test (with a value of  $p > 0.05$  indicating close fit), the comparative fit index and Tucker–Lewis index (CFI and TLI, with a value of  $\geq 0.95$  indicating close fit), root mean square error of approximation (RMSEA, with a value of  $< 0.08$  indicating close fit), the RMSEA 90% confidence interval, the RMSEA close fit  $p$ -test (with  $p > 0.05$  indicating close fit), and the standardized root mean square residual (SRMR, with a value of  $\leq 0.10$  indicating close fit) (Kline, 2016). To adjust for multiple testing, we used the classical false discovery rate method (FDR; Benjamini & Hochberg, 1995) to determine the statistical significance of the theoretical paths of interest as shown in Fig. 1 (false discovery rate set to  $\alpha = 0.05$ ). To test for moderated mediation, we calculated conditional indirect effects which were tested for statistical significance using bias-corrected bootstrap standard errors with 10,000 repetitions (Hayes & Preacher, 2013). Here, the term “indirect effect” is used to describe the statistical pathway from paternal incarceration to adolescents’ problem behaviors through family relationship quality and does not necessarily imply a causal interpretation. The analyses were carried out in Mplus 8.6 (Muthén & Muthén, 1998–2017). Conditional indirect effects were calculated using the Mplus code developed by Stride and colleagues (2015; Model 7).

Although missing data on the primary variables of interest was uncommon, many observations contained missing values on the control variables. Missing data were handled using FIML including distributional assumptions about the covariates in model estimation. We carried out an additional analysis using listwise deletion. The results were substantively similar (see Supplementary Table S4). The results from the analyses using FIML are presented in the following section.

## Results

### Descriptive Statistics

Table 1 displays the descriptive statistics for families who experienced paternal incarceration after the 3-year survey up until the year 9 survey and those who did not. Of the observations in the analytic sample, 27.0% experienced paternal incarceration after 3 three up until age 9. The descriptive results indicate that respondents who experienced paternal incarceration had higher average externalizing and internalizing problem scores at age 15, and had a lower quality father-child and father-mother relationships at age 9. Those who experienced paternal incarceration showed less favorable values on virtually all family relationship characteristics in early childhood with the exception of mother–child relationship quality at year 9 and mother engagement at year 3. Correlations between the variables included in the analyses can be found in Supplementary Table S1.

**Table 1** Descriptive statistics by whether paternal incarceration after age 3 up until age 9 occurred ( $N = 2567$ )

Variables	Paternal incarceration (y3–y9, $n = 693$ , 27.0%)		No paternal incarceration (y3–y9, $n = 1874$ , 73.0%)		$p$ -value
	Mean/percentage	Standard deviation	Mean/percentage	Standard deviation	
<i>Dependent variables (y15)</i>					
Externalizing problem behaviors (range: 0 to 2)	0.30	(0.29)	0.19	(0.22)	< .001
Internalizing problem behaviors (range: 0 to 2)	0.31	(0.34)	0.24	(0.29)	< .001
<i>Meditating variables (y9)</i>					
Father-child relationship quality (range: 1 to 4)	2.41	(1.18)	2.92	(1.06)	< .001
Mother-child relationship quality (range: 1 to 4)	3.34	(0.70)	3.39	(0.65)	.065
Father-mother relationship quality (range: 1 to 5)	2.11	(1.24)	3.21	(1.24)	< .001
<i>Family characteristics in early childhood (y3)</i>					
Father and mother in a romantic relationship	43.3%	—	66.2%	—	< .001
Father-mother co-residence	38.5%	—	63.3%	—	< .001
Father-mother relationship quality (range: 1 to 5)	2.67	(1.34)	3.44	(1.36)	< .001
Father engagement (range: 0 to 7 days)	2.42	(2.01)	3.13	(1.91)	< .001
Mother engagement (range: 0 to 7 days)	4.98	(0.87)	5.01	(0.91)	.580
Co-parenting relationship (range: 1 to 4)	3.01	(1.00)	3.40	(0.89)	< .001
Father-mother arguments (range: 1 to 5)	3.34	(1.01)	2.98	(0.92)	< .001
Mother trusts father (range: 1 to 3)	2.33	(0.84)	2.63	(0.71)	< .001
<i>Control variables</i>					
Father incarcerated after year 9 up until year 15	38.3%	—	4.8%	—	< .001
Father incarcerated before age 3	72.1%	—	26.7%	—	< .001
Mother lifetime incarceration	18.6%	—	9.6%	—	< .001
Father has problems with substance use (y1–3)	24.3%	—	7.3%	—	< .001
Mother reported being slapped, kicked or hit by father (y3)	14.2%	—	4.8%	—	< .001
Father impulsivity (father reported, y1; range: 1 to 4)	2.13	(0.70)	1.91	(0.62)	< .001
Maternal hardship (y3; range: 1 to 8)	1.19	(1.38)	0.79	(1.20)	< .001

**Table 1** (continued)

Variables	Paternal incarceration (y3–y9, n = 693, 27.0%)		No paternal incarceration (y3–y9, n = 1874, 73.0%)		p-value
	Mean/percentage	Standard deviation	Mean/percentage	Standard deviation	
Mother's education (less than high school, y0)	39.8%	—	25.5%	—	< .001
Parental depression (y1–3)	50.8%	—	33.3%	—	< .001
Father race (Black, y0)	62.9%	—	46.0%	—	< .001
Child's sex (girl, y0)	47.0%	—	48.8%	—	.408
Externalizing problem behaviors (y3; range: 0 to 2)	0.69	(0.38)	0.59	(0.33)	< .001
Internalizing problem behaviors (y3; range: 0 to 2)	0.43	(0.25)	0.37	(0.22)	< .001
Father-child co-residence (y9)	22.6%	—	58.2%	—	< .001
Father and mother in a romantic relationship (y9)	18.4%	—	54.9%	—	< .001

Sample sizes vary slightly due to missing values. y0 = measured at baseline survey, y1 = measured at 1-year survey, y3 = measured at 3-year survey; y9 = measured at 9-year survey; y15 = measured at 15-year survey

**Table 2** Fit statistics for model selection in latent profile analysis ( $N = 2567$ )

	Log-likelihood	$\Delta$ Log-likelihood	BIC	$\Delta$ BIC	LMR test ( $p$ -value)	VLMR test ( $p$ -value)	BLRT-test ( $p$ -value)	Entropy	Class proportions
1-class solution	-25,231.1	—	50,572.2	—	—	—	—	—	1.00
2-class solution	-20,573.8	-4657.3	41,336.1	9236.1	.000	.000	.000	0.96	.27, .72
<b>3-class solution</b>	<b>-19,267.2</b>	<b>-1306.6</b>	<b>38,801.3</b>	<b>2534.7</b>	<b>.013</b>	<b>.013</b>	<b>.000</b>	<b>0.93</b>	<b>.18, .58, .24</b>
4-class solution	-18,607.9	-659.3	37,561.1	1240.2	.000	.000	.000	0.95	.16, .14, .14, .56
5-class solution	-18,248.8	-359.1	36,921.5	639.6	.000	.000	.000	0.92	.13, .09, .49, .16, .13
6-class solution	-17,954.6	-294.2	36,411.7	509.8	.000	.000	.000	0.93	.07, .49, .13, .10, .09, .12

Bold values represent the final model

$\Delta$  change in fit statistics relative to previous class solution, *BIC* Bayesian information criterion, *LMR* Lo-Mendell-Rubin test, *VLMR* Vuong-Lo-Mendell-Rubin test, *BLRT* bootstrap likelihood ratio test (based on 500 draws)



## Latent Profile Analysis

The model fit statistics of the one to six-class solutions of the latent profile analysis are reported in Table 2. The log-likelihood and BIC decreased with each model, and the LMR, VLMR, and BLRT tests were significant for all solutions. These indices suggest that each subsequent model was a better fit to the data than the previous one. Entropy values were satisfactory across all solutions, suggesting low classification error. As the model fit improved for each additional class, we examined where the improvement in model fit reached a point of diminishing returns (Nylund-Gibson & Choi, 2018). The relative improvement of fit strongly diminished after the 2-class model. However, in relation to the 2-class solution, the 3-class solution identified a relevant additional analytically relevant category of families that was not identified in the 2-class solution (e.g., largely non-resident fathers who maintained a degree of parental involvement). The three-class solution was also preferable over the four-class solution, as this solution divided one of the classes in the three-class solution (the “Fragmented” cluster, see the three-class solution described below) into two smaller classes: one with more and one with less involved fathers. As such, the four-class solution did not add an analytically relevant new category. For this reason, we chose the three-class model.

Descriptive statistics for the three latent profiles are shown in Table 3. The first class (58.2% of the sample) contained predominantly intact family structures at the year-3 survey, with the most overall positive values on the family relationship indicators. We labeled the first class “Cohesive”. In this class, 18.6% of children experienced paternal incarceration after age 3 up until age 9, of which 38.4% experienced fathers’ first-time incarceration. Families in this class had the lowest rates of paternal incarceration and the highest rates of first-time incarceration. The second class (23.9% of the sample) contained mostly families with non-resident fathers where fathers and mothers were not in a romantic relationship. Father-mother relationship quality averaged between “fair” and “good”, and co-parenting relationships were relatively positive. On average,

**Table 3** Means and percentages for indicators of the latent profile analysis ( $N = 2567$ )

Indicators in the latent profile analysis	Class 1 (58.2%); Cohesive	Class 2 (23.9%); Fragmented	Class 3 (17.9%); Disharmonious
Father and mother in a romantic relationship	95.8%	16.8%	0.0%
Father-mother co-residence	92.8%	10.9%	0.0%
Father-mother relationship quality (1 = <i>poor</i> , 5 = <i>excellent</i> )	4.09	2.51	1.20
Father engagement (range: 0 to 7 days)	4.12	1.90	0.10
Mother engagement (range: 0 to 7 days)	5.05	4.87	5.01
Co-parenting relationship (range: 1 to 4)	3.82	3.29	1.41
Father-mother arguments (1 = <i>never</i> , 5 = <i>always</i> )	2.80	3.30	3.78
Mother trusts father (% very much)	94.5%	60.4%	1.2%

All indicators are measured at the 3-year survey

fathers engaged in activities with their children almost 2 days per week. We labeled the second class “Fragmented”. In this class, 38.0% of children experienced paternal incarceration, of which 25.8% experienced fathers’ first-time incarceration. The last class (17.9% of the sample) had the least positive values on all family relationship indicators. This class was characterized by non-resident fathers, a lack of romantic relationships between father and mother, poor father–mother relationship quality, and a near total absence of father involvement in the child’s life. In this group, co-parenting relationships were poor, trust was low, and arguments between mother and father were frequent. We labeled the third class “Disharmonious”. In the third class, 39.7% of children experienced paternal incarceration, of which 13.9% experienced fathers’ first-time incarceration. Families in this class had the highest rates of paternal incarceration and the lowest rates of first-time paternal incarceration.

Table 4 presents descriptive statistics of the main variables of interest split by paternal incarceration and pre-incarceration family characteristic cluster membership. Adolescents who experienced paternal incarceration in early or middle childhood had statistically significantly higher externalizing problem behavior scores across all latent classes. Internalizing problem behaviors were statistically significantly higher among adolescents who experienced paternal incarceration in the “Disharmonious” clusters, but not in the “Cohesive” and “Fragmented” clusters. Father–child and mother–father relationship quality scores at age 9 were lower among those who experienced paternal incarceration in early or middle childhood but only in the “Cohesive” and “Fragmented” family clusters. Those with and without paternal incarceration experiences in early or middle childhood experiences did not differ, in any cluster, in terms of mother–child relationship quality at age 9. In relation to the control variables, children in the “Disharmonious” classes faced the most severe disadvantages (e.g., higher rates of maternal incarceration, paternal substance use problems, and domestic violence; results shown in Supplementary Table S2).

### Moderated Mediation Analysis

We estimated a path model that included the following pathways: (1) from paternal incarceration to adolescent problem behaviors, (2) from paternal incarceration to family relationship quality, (3) from family relationship quality to adolescent problem behaviors, (4) from all control variables to all predicted variables. Two interaction terms were used to test for moderation, in which the variables on paternal incarceration and latent class membership were used: (i) paternal incarceration  $\times$  “Fragmented” latent class membership and (ii) paternal incarceration  $\times$  “Disharmonious” latent class membership. Both interaction terms were included in the paths from paternal incarceration to the three family relationship variables. The “Cohesive” family relationship cluster served as the reference group. The direct effect of paternal incarceration in early or middle childhood on family relationship quality at age 9 therefore refers to the coefficient for the “Cohesive” cluster. Latent class membership was also used as a predictor in all paths. Note that all dependent variables were standardized. The model fit the data well ( $\chi^2(5) = 7.28$ ,  $p = 0.20$ , RMSEA = 0.01, RMSEA 90% confidence interval = 0.00 to 0.03, probability

**Table 4** Descriptive statistics of main study variables by paternal incarceration after age 3 up until age 9 and latent class membership ( $N = 2567$ )

	Class 1 ( $N = 1494$ , 58.2%); Cohesive			Class 2 ( $N = 614$ , 23.9%); Fragmented			Class 3 ( $N = 459$ , 17.9%); Disharmonious		
	Paternal incarceration ( $N = 278$ , 18.6%)	No paternal incarceration ( $N = 1216$ , 81.4%)	Difference	Paternal incarceration ( $N = 233$ , 38.0%)	No paternal incarceration ( $N = 381$ , 62.0%)	Difference	Paternal incarceration ( $N = 182$ , 39.7%)	No paternal incarceration ( $N = 277$ , 60.3%)	Difference
	$M$ (SD)	$M$ (SD)	$p$ -value (two-tailed)	$M$ (SD)	$M$ (SD)	$p$ -value (two-tailed)	$M$ (SD)	$M$ (SD)	$p$ -value (two-tailed)
<i>Dependent variables (y15)</i>									
Externalizing problem behaviors	0.27 (0.28)	0.17 (0.21)	<.001	0.29 (0.27)	0.21 (0.25)	<.001	0.34 (0.33)	0.23 (0.25)	<.001
Internalizing problem behaviors	0.27 (0.32)	0.23 (0.29)	.091	0.29 (0.30)	0.25 (0.28)	.052	0.39 (0.39)	0.27 (0.33)	<.001
<i>Mediating variables (y9)</i>									
Father-child relationship	2.70 (1.1)	3.24 (0.80)	<.001	2.50 (1.18)	2.73 (1.14)	.012	1.85 (1.11)	1.73 (1.07)	.252
Mother-child relationship	3.34 (0.72)	3.40 (0.62)	.187	3.34 (0.66)	3.35 (0.74)	.703	3.32 (0.73)	3.41 (0.67)	.208
Father-mother relationship	2.47 (1.32)	3.71 (1.15)	<.001	2.00 (1.17)	2.58 (1.27)	<.001	1.68 (1.04)	1.73 (1.17)	.644

$p$ -values were calculated with two-sided  $t$ -tests.  $y9$  = measured at 9-year survey;  $y15$  = measured at 15-year survey

RMSEA  $\leq 0.05 = 1.00$ , CFI = 0.999, TLI = 0.986, SRMR = 0.002). For reference, we estimated a model without interaction terms, in which we found statistically significant indirect effects of paternal incarceration on adolescents' externalizing problem behaviors through father-mother relationship quality (model shown in Supplementary Figure S3). Figure 3 shows the results for the moderated mediation model (full results of the model are available in Supplementary Table S4).

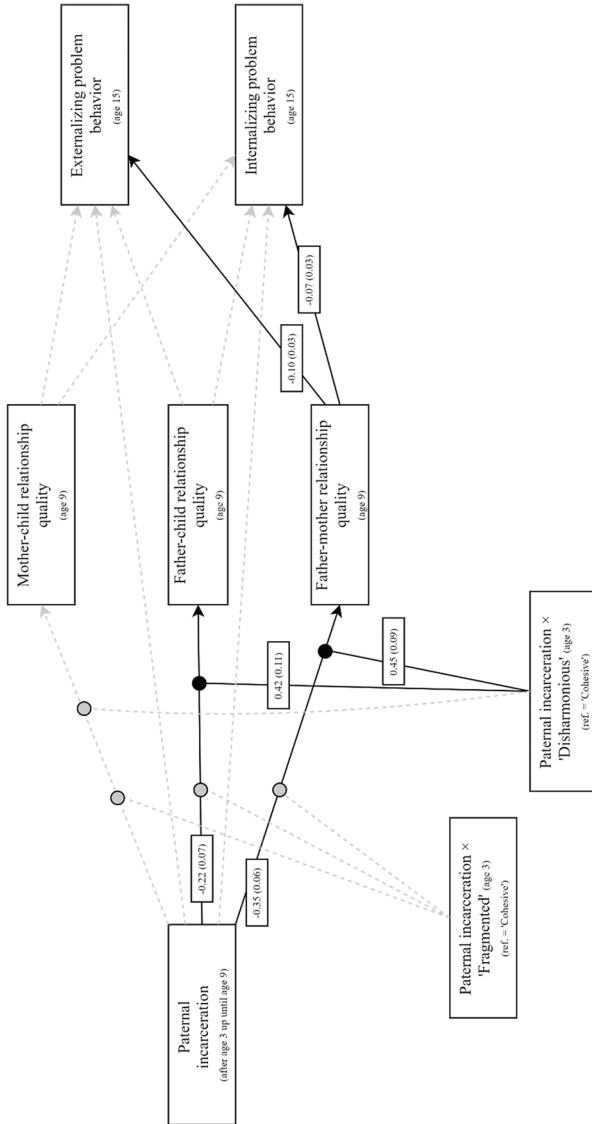
### Moderating Effect of Pre-Incarceration Family Cluster on the Association Between Paternal Incarceration and Family Relationship Quality

The associations between paternal incarceration in early or middle childhood and family relationship quality at age 9 were found to differ by pre-incarceration family cluster. This pattern was strongest for father-mother relationships. For families best characterized by the "Cohesive" family cluster at age 3, the association between paternal incarceration and father-mother relationships was negative ( $b = -0.35$ ,  $p < 0.001$ ). The interaction term between paternal incarceration and being characterized by the "Fragmented" cluster was not statistically significant, indicating no differences in the association between paternal incarceration and father-mother relationship quality in relation to the "Cohesive" cluster. As such, the relationship between paternal incarceration and father-mother relationship quality was also negative for the "Fragmented" cluster. The interaction term between paternal incarceration and being characterized by the "Disharmonious" cluster was a statistically significant predictor of father-mother relationship quality ( $b = 0.45$ ,  $p < 0.001$ ). This interaction implied a null-association between paternal incarceration and father-mother relationship quality at age 9 in the "Disharmonious" cluster ( $b = 0.09$ ,  $p > 0.05$ ).

Regarding father-child relationship quality at age 9, we found a statistically significant negative association with paternal incarceration in early or middle childhood in the "Cohesive" group ( $b = -0.22$ ,  $p < 0.001$ ). In the "Fragmented" cluster, both the interaction term and the main effect of paternal incarceration on father-child relationships were not statistically significant. The interaction term between paternal incarceration and the "Disharmonious" cluster was positive and statistically significant ( $b = 0.42$ ,  $p < 0.001$ ). The interaction term implied that paternal incarceration positively related to father-child relationship quality ( $b = 0.20$ ,  $p = 0.034$ ), but this effect was not considered statistically significant after applying the FDR correction. No effects of paternal incarceration on mother-child relationship quality were found.

### Direct Effects on Adolescents' Problem Behaviors

We found that various factors were related to adolescents' problem behaviors at age 15. Although we found a significant positive association between paternal incarceration and externalizing problems ( $b = 0.12$ ,  $p = 0.031$ ), this association was not considered statistically significant after applying the FDR correction. No statistically significant association between paternal incarceration and internalizing problem behaviors was found. Higher quality father-mother relationship quality at age 9 significantly predicted adolescents' lower externalizing problem behaviors ( $b = -0.10$ ,



**Fig. 3** Moderated mediation model ( $N=2567$ ). Only pathways corresponding to the conceptual model are depicted. Coefficients in black are statistically significant after FDR correction for multiple testing. Robust standard errors are shown in parentheses. Gray dashed arrows represent non-significant pathways. All dependent variables are standardized. All paths control for prior paternal incarceration, paternal incarceration between ages 9 and 15, maternal lifetime incarceration, paternal problematic substance use, household violence, father impulsivity, maternal hardship, mother's educational attainment, parental depression, father's race, child's sex, children's internalizing and externalizing behaviors at age 3, father-child co-residence at age 9, and father-mother relationship status at age 9. All paths include the main effects of latent class membership. Model fit statistics are as follows:  $\chi^2(5)=7.28$ ,  $p=.20$ , RMSEA = 0.01, RMSEA 90% confidence interval = 0.00–0.03, probability RMSEA  $\leq 0.05 = 1.00$ , CFI = 0.999, TLI = 0.986, and SRMR = 0.002

$p < 0.001$ ) and internalizing problem behaviors ( $b = -0.07$ ,  $p = 0.006$ ), whereas father-child and mother-child relationship quality were not significantly associated with adolescents' problem behaviors.

### Conditional Indirect Effects

To test for moderated mediation, we calculated the conditional indirect effects of paternal incarceration in early or middle childhood through the family relationship quality at age 9 variables on internalizing and externalizing problem behavior for each of the three pre-incarceration family clusters (full results are available in Supplementary Table S5). We found statistically significant indirect effects of paternal incarceration on externalizing problem behavior through decreased father-mother relationship quality for the "Cohesive" cluster ( $b = 0.037$ , 99% CI = [0.012; 0.072]) and the "Fragmented" cluster ( $b = 0.023$ , 99% CI = [0.004; 0.055]). For internalizing problem behaviors, we found similar patterns. Statistically significant indirect effects of paternal incarceration through decreased father-mother relationship quality on internalizing problem behaviors were found in the "Cohesive" cluster ( $b = 0.025$ , 99% CI = [0.002; 0.057]) and the "Fragmented" cluster ( $b = 0.016$ , 99% CI = [0.001; 0.044]). For the "Disharmonious" cluster, no statistically significant indirect effects were found. Overall, the results provided evidence for a moderated mediation, as the degree to which father-mother relationship quality mediated the relation between paternal incarceration and adolescents' problem behaviors differed by pre-incarceration family cluster.

### Sensitivity Analyses

Sensitivity analyses (not shown) revealed that the results were largely robust to an alternative, more stringent model specification. In this alternative model, we did not include families experiencing paternal incarceration at the time of the year-9 survey in our measure of parental incarceration to more strictly establish temporal ordering. Compared to the main model, the only substantive difference was that the indirect effect of paternal incarceration on internalizing problem behavior through father-mother relationship quality for the "Fragmented" cluster was no longer statistically significant.

### Discussion

There is increasing evidence that paternal incarceration, on average, negatively affects children's outcomes (Lee & Wildeman, 2021; Wakefield & Wildeman, 2013). Few studies have addressed the mechanisms that account for the largely negative consequences of incarceration for children's outcomes and the conditions under which these occur. Drawing from family stress theory and family systems theory, we conceptualized paternal incarceration as a stressor with ripple effects for the whole family and outlined that its consequences differed based on pre-incarceration family characteristics. Using longitudinal data from the FFCWS—a survey uniquely suited to examine the intersection between paternal incarceration, family life, and

adolescents' outcomes—we found that family relationships play an important role in the consequences of paternal incarceration for children.

First, we developed three family clusters based on early childhood family relationships before paternal incarceration took place (“Cohesive”, “Fragmented”, and “Disharmonious”). Although other studies have applied clustering analyses to the heterogeneity of populations exposed to parental incarceration (Dennison et al., 2020; Johnson et al., 2018; Kremer et al., 2020; Ng et al., 2013), our study is unique in its focus on developing pre-incarceration family clusters that are then used in a moderated mediation framework. The findings demonstrated that latent profile analysis provided a meaningful way to analyze the heterogeneity of pre-incarceration family characteristics, going beyond measures often used in previous research such as father-child co-residence (Geller et al., 2012; Turney & Wildeman, 2013). Using this methodology, we identified two different groups of non-resident fathers; non-resident fathers who were involved in family life to some degree, and non-resident fathers who were largely disengaged from family life. This distinction would be overlooked when solely considering measures of fathers' residential status. Furthermore, the three groups identified in the latent profile analysis provide conceptually and practically meaningful groups of families for which paternal incarceration is most deleterious. Rates of paternal incarceration as well as pre-incarceration risk factors (e.g., material hardship, domestic violence, paternal substance abuse, parental depression) varied markedly across the three clusters.

Second, we demonstrated that the association between paternal incarceration and family relationships differed across pre-incarceration family clusters and by family relationship type. Our research underscores that to comprehensively understand the impact of paternal incarceration on family relationships, researchers must consider pre-incarceration family relationships and include multiple types of relationships within the family in their analyses. Our findings are consistent with previous research showing that father-child and father-mother relationships are negatively affected by paternal incarceration, but mother-child relationships are not (Turney, 2023; Turney & Wildeman, 2013). Thus, it becomes clear that paternal incarceration has different consequences for different dyadic relationships within the family. The results are also in line with earlier research suggesting that the negative effects of paternal incarceration on family relationships are concentrated in families with more positive relationships before imprisonment (Turanovic et al., 2012; Turney, 2023). The lack of effects of paternal incarceration on family relationship quality in the “Disharmonious” clusters may be explained by a floor effect; family relationships that were already poor are unlikely to decrease further in quality because of incarceration.

Third, we found evidence that diminished father-mother relationship quality operates as a mechanism through which the negative consequences of paternal incarceration for adolescents' problem behaviors are transmitted, but only among families in the “Cohesive” and “Fragmented” clusters. The results were most pronounced for externalizing problem behaviors, as the indirect effect on internalizing problem behaviors for the “Fragmented” family cluster was not statistically significant in a more rigorous analysis. Our study is the first to demonstrate that the working of the family relationship mechanism in the link between paternal incarceration and adolescent problem behavior depends on pre-incarceration family characteristics. If

pre-incarceration family characteristics had not been included in the analyses, we would have overlooked the heterogeneity of indirect effects based on pre-incarceration family characteristics. This finding contributes to our understanding of the family relationship processes through which parental incarceration affects adolescent outcomes. The results are in line with the idea that among families with less harmonious family relationships, who on average also more often faced other family-related risks (e.g., paternal substance abuse, family violence, parental depression), the stressor of paternal incarceration may not have additional negative consequences for behavioral problems among youth over and above the disadvantage already faced (Giordano et al., 2019).

The key takeaway message of this study is that it is essential to view the impact of paternal incarceration on families within the family relationship context in which paternal incarceration occurs. The study deepens our understanding of how pre-incarceration family characteristics shape the impact of paternal incarceration on father-mother and father-child relationships and points out that decreased father-mother relationship quality is likely a central pathway through which paternal incarceration affects adolescents' problem behaviors—but only among families with higher quality pre-incarceration family characteristics. Our findings support the idea that families with higher quality pre-incarceration family relationships may be more vulnerable to the negative impact of paternal incarceration, as the changes caused by paternal incarceration are more severe. However, family stress theory underscores that it may be precisely these families that also have more adaptive resources to recover from the crisis in the longer term. In line with family systems theory, our findings support the notion that the consequences of paternal incarceration should be viewed at the family level rather than on the individual or the dyadic level. Family systems theory further points to the potential role of relationships with stepparents, siblings, and grandparents. Including these more complex family dynamics in the parental incarceration literature (for example sibling incarceration or stepfather incarceration) would be an interesting avenue for further research.

## Limitations

The study was limited in a few ways. The observational nature of the study limited our ability to draw causal conclusions. Discerning the causal effects of paternal incarceration on child outcomes is problematic because of the complex processes of selection into incarceration through criminal lifestyle, mental problems, and substance use. Paternal incarceration could simply be a marker of a pre-existing disadvantage rather than causally affecting child well-being (Wakefield & Wildeman, 2013). Paternal incarceration often constitutes a “tightly coupled package” with other family-related risk factors (e.g., parental drug use, and violence within the family). Such risk factors could be more impactful on children's social disadvantage and criminal behavior in later life than the singular event of parental incarceration (Giordano et al., 2019). Although we controlled for various confounders that tap into pre-incarceration paternal criminality to estimate the independent effect of paternal incarceration, it is important to underscore that any measure of paternal



incarceration also captures unmeasured elements of pre-incarceration criminality, criminal justice system contact, and other problem behaviors in the family as well as post-incarceration reintegration processes. Future research should try to empirically integrate the link between paternal incarceration and adolescents' outcomes in the context of both pre-incarceration family relationship context as well as pre-existing family-related risk factors like parental drug use and violence within the family.

A further limitation relates to our measure of paternal incarceration. The time span of our measure was relatively wide (after age 3 up until age 9). This may be problematic, as recent studies suggested that the effects of paternal incarceration on children's developmental outcomes may depend on the timing of the event (Turney, 2022; Young et al., 2020). Due to the various subgroups of pre-incarceration family characteristics used in the analyses, however, having a wider time span was required to retain sufficient sample sizes to conduct meaningful statistical analyses. Another limitation of the paternal incarceration measure in the FFCWS was that it contained limited or no information on the duration of the incarceration spell, the type and severity of the crime, the number of incarceration spells, the correctional facility type (e.g., jail, minimum security prison, maximum security prison), facility location, details on whether the child witnessed the arrest and was aware of father's incarceration, and the degree to which family contact was maintained during the incarceration spell. Future research would benefit from collecting incarceration-specific information to study the conditions under which and the mechanisms through which paternal incarceration affects children's outcomes more closely. Another limitation relates to the use of single-actor reports; we mostly used caregiver reports to measure family relationships and youth behavior. This may be problematic, as reports of family relationships and adolescent behaviors have been found to differ across informants (Mikelson, 2008; Robinson et al., 2019). As such, future studies should ideally rely on multiple informants.

A further limitation relates to generalizability. The FFCWS oversampled unmarried parents in urban areas. As a result, the data are not generalizable to all families. For example, the data do not represent the experiences of more privileged families affected by paternal incarceration. The experiences of these families may be another source of heterogeneity. Although the data were well suited for our study purposes (as many families in the sample experienced paternal incarceration), children from more advantaged families were underrepresented. Future research on paternal incarceration would benefit from using nationally representative data that contain detailed information about paternal incarceration.

Last, the analyses span multiple developmental periods. On the one hand, the long time span is a strength of our study as it provided a unique opportunity to disentangle the role of pre-incarceration family characteristics in early childhood in the link between paternal incarceration in early or middle childhood and children's outcomes in adolescence. On the other hand, the analyses provided limited possibilities to examine how relationships between children with their parents and family changed from early childhood through adolescence due to factors other than paternal incarceration. It is possible that during the years between the survey waves, factors other than paternal incarceration that are not included in the model have affected family relationship quality and adolescents' behaviors. Further, we

could not explore the possible age-graded nature of the impact of paternal incarceration within this study. The family stress-proximal process model further underscores the need to include measures of concepts such as parenting stress, ambiguous loss, caregiver parenting, contact and visitation experiences, youth coping, and social support in future research on the effects of parental incarceration (Arditti, 2016).

## Policy Implications

As the negative consequences of paternal incarceration were found to depend on the pre-incarceration family context, a one-size-fits-all policy approach to supporting children experiencing paternal incarceration is unlikely to be effective for all children and families. The needs of families may vary widely across different pre-incarceration family contexts. Families with more “Cohesive” pre-prison family relationships were also most likely to experience first-time paternal incarceration. During incarceration, these families are likely to have different family-related needs. It is plausible that for more cohesive families, the primary need is to prevent family relationships from deteriorating, which could be addressed by providing facilities to maintain meaningful family contact during imprisonment. For families with more complex relationships, such as families in “Fragmented” and “Disharmonious” clusters, the primary needs may center on repairing fragile relationships, which may require more in-depth family relationship programs. In addition, families in the “Disharmonious” cluster in particular tended to have higher levels of disadvantage, indicating high risk and the greatest need for support. For these families, broader social welfare policies and community programs may be most effective. In sum, policies that aimed at mitigating the negative impact of paternal incarceration on families need to be sensitive to the relationship characteristics of families prior to incarceration.

## Conclusion

Our study extends prior research by demonstrating that it is essential to address the family relationship context to understand the consequences of paternal incarceration for children. We found that the associations between paternal incarceration, family relationships, and adolescents’ internalizing and externalizing problem behaviors differed by family relationship characteristics before incarceration, and that decreased father-mother relationship quality mediated the association between paternal incarceration and adolescents’ problem behaviors when family relationships before incarceration were of high quality. The findings of this study bring us closer to understanding which children are vulnerable when facing paternal incarceration, and why. A more nuanced and detailed understanding of the heterogeneous consequences of paternal incarceration aids in understanding the intergenerational consequences of incarceration, and in developing effective policy efforts to mitigate harm for children affected by paternal incarceration.

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s40865-024-00253-6>.

## Declarations

**Conflict of Interest** The authors declare no competing interests.

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## References

- Achenbach, T. M. (1991). *Manual for the child behavior checklist/4-18 and 1991 profile*. University of Vermont.
- Antle, K., Gibson, C. L., & Krohn, M. D. (2019). The mediating role of family dynamics in the relationship between paternal incarceration and child behavior problems. *Journal of Crime and Justice*, 43(1), 16–35. <https://doi.org/10.1080/0735648X.2019.1619615>
- Arditti, J. A. (2016). A family stress-proximal process model for understanding the effects of parental incarceration on children and their families. *Couple and family psychology: Research and practice*, 5(2), 65–88. <https://doi.org/10.1037/cfp0000058>
- Arditti, J. A., & Johnson, E. I. (2022). A family resilience agenda for understanding and responding to parental incarceration. *American Psychologist*, 77(1), 56–70. <https://doi.org/10.1037/amp0000687>
- Arditti, J. A., Lambert-Shute, J., & Joest, K. (2003). Saturday morning at the jail: Implications of incarceration for families and children. *Family Relations*, 52(3), 195–204. <https://doi.org/10.1111/j.1741-3729.2003.00195.x>
- Arditti, J. A., Smock, S. A., & Parkman, T. S. (2005). “It’s been hard to be a father”: A qualitative exploration of incarcerated fatherhood. *Fathering*, 2(3), 267–288. <https://doi.org/10.3149/fth.0303.267>
- Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society: Series B (methodological)*, 57(1), 289–300. <https://doi.org/10.1111/j.2517-6161.1995.tb02031.x>
- Besemer, K. L., & Dennison, S. M. (2018). Family imprisonment, maternal parenting stress and its impact on mother-child relationship satisfaction. *Journal of Child & Family Studies*, 27(12), 3897–3908. <https://doi.org/10.1007/s10826-018-1237-7>
- Bradshaw, D., Creaven, A.-M., & Muldoon, O. T. (2021). Parental incarceration affects children’s emotional and behavioral outcomes: A longitudinal cohort study of children aged 9 to 13 years. *International Journal of Behavioral Development*, 45(4), 310–316. <https://doi.org/10.1177/0165025421995918>
- Braman, D. (2007). *Doing time on the outside: Incarceration and family life in urban America*. University of Michigan Press. <https://doi.org/10.3998/mpub.17629>
- Collins, L. M., & Lanza, S. T. (2009). *Latent class and latent transition analysis*. John Wiley & Sons, Inc. <https://doi.org/10.1002/9780470567333>
- Cox, M. J., & Paley, B. (2003). Understanding families as systems. *Current Directions in Psychological Science*, 12(5), 193–196. <https://doi.org/10.1111/1467-8721.01259>
- Dennison, S., Besemer, K., & Low-Choy, S. (2020). Maternal parenting stress following paternal or close family incarceration: Bayesian model-based profiling using the HILDA longitudinal survey. *Journal of Quantitative Criminology*, 36(4), 753–778. <https://doi.org/10.1007/s10940-019-09430-z>
- Dennison, S., Smallbone, H., & Occhipinti, S. (2017). Understanding how incarceration challenges proximal processes in father-child relationships: Perspectives of imprisoned fathers.

- Journal of Developmental and Life-Course Criminology*, 3(1), 15–38. <https://doi.org/10.1007/s40865-017-0054-9>
- Dickman, S. J. (1990). Functional and dysfunctional impulsivity: Personality and cognitive correlates. *Journal of Personality and Social Psychology*, 58(1), 95–102. <https://doi.org/10.1037/0022-3514.58.1.95>
- Dwyer Emory, A. (2018). Explaining the consequences of paternal incarceration for children's behavioral problems. *Family Relations*, 67(2), 302–319. <https://doi.org/10.1111/fare.12301>
- Fallesen, P., & Andersen, L. H. (2017). Explaining the consequences of imprisonment for union formation and dissolution in Denmark. *Journal of Policy Analysis and Management*, 36(1), 154–177. <https://doi.org/10.1002/pam.21933>
- Geller, A. (2013). Paternal incarceration and father-child contact in fragile families. *Journal of Marriage and Family*, 75(5), 1288–1303. <https://doi.org/10.1111/jomf.12056>
- Geller, A., Cooper, C. E., Garfinkel, I., Schwartz-Soicher, O., & Mincy, R. B. (2012). Beyond absenteeism: Father incarceration and child development. *Demography*, 49(1), 49–76. <https://doi.org/10.1038/jid.2014.371>
- Geller, A., Garfinkel, I., & Western, B. (2011). Paternal incarceration and support for children in fragile families. *Demography*, 48(1), 25–47. <https://doi.org/10.1007/s13524-010-0009-9>
- Giordano, P. C., Copp, J. E., Manning, W. D., & Longmore, M. A. (2019). Linking parental incarceration and family dynamics associated with intergenerational transmission: A life-course perspective. *Criminology*, 57(3), 395–423. <https://doi.org/10.1111/1745-9125.12209>
- Glaze, L. E., & Maruschak, L. M. (2010). *Parents in prison and their minor children*. <https://www.bjs.gov/content/pub/pdf/pptmc.pdf>
- Hayes, A. F., & Preacher, K. J. (2013). Conditional process modeling: Using structural equation modeling to examine contingent causal processes. In G. R. Hancock & R. O. Mueller (Eds.), *Quantitative methods in education and the behavioral sciences: Issues, research, and teaching. Structural equation modeling: A second course* (pp. 219–266). Information Age Publishing.
- Johnson, E. I., Arditti, J. A., & McGregor, C. M. (2018). Risk, protection, and adjustment among youth with incarcerated and non-resident parents: A mixed-methods study. *Journal of Child and Family Studies*, 27, 1914–1928. <https://doi.org/10.1007/s10826-018-1045-0>
- Kessler, R. C., Andrews, G., Mroczek, D., Ustun, B., & Wittchen, H. (1998). The World Health Organization composite international diagnostic interview short-form (CIDI-SF). *International Journal of Methods in Psychiatric Research*, 7(4), 171–185. <https://doi.org/10.1002/mpr.47>
- Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). Guilford Publications: The Guildford Press.
- Kremer, K. P., Poon, C. Y. S., Jones, C. L., Hagler, M. A., Kupersmidt, J. B., Stelter, R. L., Stump, K. N., & Rhodes, J. E. (2020). Risk and resilience among children with incarcerated parents: Examining heterogeneity in delinquency and school outcomes. *Journal of Child and Family Studies*, 29(11), 3239–3252. <https://doi.org/10.1007/s10826-020-01822-1>
- Lavee, Y. (2013). Stress processes in families and couples. In G. W. Peterson & K. R. Bush (Eds.), *Handbook of marriage and the family* (pp. 159–176). Springer US. [https://doi.org/10.1007/978-1-4614-3987-5\\_8](https://doi.org/10.1007/978-1-4614-3987-5_8)
- Lee, H., & Wildeman, C. (2021). Assessing mass incarceration's effects on families. *Science*, 374(6565), 277–281. <https://doi.org/10.1126/science.abj7777>
- Mikelson, K. S. (2008). He said, she said: Comparing mother and father reports of father involvement. *Journal of Marriage and Family*, 70(3), 613–624. <https://doi.org/10.1111/j.1741-3737.2008.00509.x>
- Murphey, D., & Cooper, P. M. (2015). *Parents behind bars: What happens to their children?* <https://doi.org/10.13140/RG.2.1.2444.4243>
- Murray, J., & Farrington, D. P. (2008). The effects of parental imprisonment on children. *Crime and Justice*, 37(1), 133–206. <https://doi.org/10.1086/520070>
- Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus user's guide* (8th ed.). Muthén & Muthén.
- Ng, I. Y. H., Sarri, R. C., & Stoffregen, E. (2013). Intergenerational incarceration: Risk factors and social exclusion. *Journal of Poverty*, 17(4), 437–459. <https://doi.org/10.1080/10875549.2013.833161>
- Nylund-Gibson, K., & Choi, A. Y. (2018). Ten frequently asked questions about latent class analysis. *Translational Issues in Psychological Science*, 4(4), 440–461. <https://doi.org/10.1037/tps0000176>
- Poehlmann-Tynan, J., & Arditti, J. A. (2018). Developmental and family perspectives on parental incarceration. In C. Wildeman, A. R. Haskins, & J. Poehlmann-Tynan (Eds.), *When parents are incarcerated: Interdisciplinary research and interventions to support children* (pp. 53–81). American Psychological Association. <https://doi.org/10.1037/0000062-004>

- Poehlmann-Tynan, J., & Turney, K. (2021). A developmental perspective on children with incarcerated parents. *Child Development Perspectives*, 15(1), 3–11. <https://doi.org/10.1111/cdep.12392>
- Reichman, N. E., Teitler, J. O., Garfinkel, I., & McLanahan, S. S. (2001). Fragile families: Sample and design. *Children and Youth Services Review*, 23(4–5), 303–326. [https://doi.org/10.1016/S0190-7409\(01\)00141-4](https://doi.org/10.1016/S0190-7409(01)00141-4)
- Robinson, M., Doherty, D. A., Cannon, J., Hickey, M., Rosenthal, S. L., Marino, J. L., & Skinner, S. R. (2019). Comparing adolescent and parent reports of externalizing problems: A longitudinal population-based study. *British Journal of Developmental Psychology*, 37(2), 247–268. <https://doi.org/10.1111/bjdp.12270>
- Stride, C. B., Gardner, S. E., Catley, N., & Thomas, F. (2015). *Mplus code for mediation, moderation and moderated mediation models*. [http://www.figureitout.org.uk/models\\_and\\_index.pdf](http://www.figureitout.org.uk/models_and_index.pdf)
- Turanovic, J. J., Rodriguez, N., & Pratt, T. C. (2012). The collateral consequences of incarceration revisited: A qualitative analysis of the effects on caregivers of children of incarcerated parents. *Criminology*, 50(4), 913–959. <https://doi.org/10.1111/j.1745-9125.2012.00283.x>
- Turney, K. (2014). The consequences of paternal incarceration for maternal neglect and harsh parenting. *Social Forces*, 92(4), 1607–1636. <https://doi.org/10.1093/sf/sot160>
- Turney, K. (2015). Hopelessly devoted? Relationship quality during and after incarceration. *Journal of Marriage and Family*, 77(2), 480–495. <https://doi.org/10.1111/jomf.12174>
- Turney, K. (2017). The unequal consequences of mass incarceration for children. *Demography*, 54(1), 361–389. <https://doi.org/10.1007/s13524-016-0543-1>
- Turney, K. (2022). Chains of adversity: The time-varying consequences of paternal incarceration for adolescent behavior. *Journal of Quantitative Criminology*, 38(1), 159–196. <https://doi.org/10.1007/s10940-020-09485-3>
- Turney, K. (2023). Parental incarceration and parent–youth closeness. *Journal of Marriage and Family*, 1–23. <https://doi.org/10.1111/jomf.12919>
- Turney, K., & Marín, E. (2022). Paternal incarceration: Resilience in father-child relationships. In J. E. Glick, V. King, & S. M. McHale (Eds.), *Parent-child separation* (pp. 109–130). Springer. [https://doi.org/10.1007/978-3-030-87759-0\\_5](https://doi.org/10.1007/978-3-030-87759-0_5)
- Turney, K., & Wildeman, C. (2013). Redefining relationships: Explaining the countervailing consequences of paternal incarceration for parenting. *American Sociological Review*, 78(6), 949–979. <https://doi.org/10.1177/0003122413505589>
- Venema, S. D., Haan, M., Blaauw, E., & Veenstra, R. (2022). Paternal imprisonment and father-child relationships: A systematic review. *Criminal Justice and Behavior*, 49(4), 492–512. <https://doi.org/10.1177/00938548211033636>
- Wakefield, S., & Powell, K. (2016). Distinguishing petty offenders from serious criminals in the estimation of family life effects. *Annals of the American Academy of Political and Social Science*, 665(1), 195–212. <https://doi.org/10.1177/0002716216633078>
- Wakefield, S., & Wildeman, C. (2013). Children of the prison boom: Mass incarceration and the future of American inequality. *Oxford University Press*. <https://doi.org/10.1093/acprof:oso/9780199989225.001.0001>
- Wildeman, C. (2010). Paternal incarceration and children's physically aggressive behaviors: Evidence from the fragile families and child wellbeing study. *Social Forces*, 89(1), 285–309. <https://doi.org/10.1353/sof.2010.0055>
- Wright, M. O., Masten, A. S., & Narayan, A. J. (2013). Resilience processes in development: Four waves of research on positive adaptation in the context of adversity. In *Handbook of resilience in children* (pp. 15–37). Springer US. [https://doi.org/10.1007/978-1-4614-3661-4\\_2](https://doi.org/10.1007/978-1-4614-3661-4_2)
- Young, B., Collier, N. L., Siennick, S. E., & Mears, D. P. (2020). Incarceration and the life course: Age-graded effects of the first parental incarceration experience. *Journal of Developmental and Life-Course Criminology*, 6(3), 256–279. <https://doi.org/10.1007/s40865-020-00143-7>