



Direct and Indirect Longitudinal Associations of Mother and Father Engagement in Middle Childhood on Adolescent Externalizing and Internalizing Behaviors

Panpan Yang¹ · Sarah L. Pachman¹ · Gabriel L. Schlomer² · Kathryn J. Edin¹

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Abstract

Parent engagement is an important aspect of parenting during childhood. However, little is known about the unique longitudinal associations of mother and father engagement with adolescents' externalizing and internalizing problem behaviors. This study uses Future of Families and Child Wellbeing Study data to examine the potential direct and indirect associations of parent engagement at age 9 on adolescent externalizing and internalizing behaviors at age 15. The analytic sample size is 1349, and at age 9, the mean age of children was 9.40 years ($SD = 0.37$). Forty-eight percent of children were female and 68% of them were from the married families. The results show that while controlling for mother engagement, higher father engagement at age 9 was directly associated with fewer adolescent internalizing behaviors, only among adolescent boys and in married families. In addition, among adolescent boys, father engagement had an indirect association with externalizing behaviors through father–child closeness. Mother engagement, however, is only found to have an indirect association with adolescents' externalizing and internalizing behaviors through maternal hostility (while controlling for father engagement). The results for mother engagement held for boys and in married families only. The findings indicate that both mother and father engagement during childhood is important and helpful to prevent adolescent problem behaviors directly or indirectly via parent–child relationship.

Keywords Father engagement · Mother engagement · Adolescent externalizing behaviors · Adolescent internalizing behaviors · Father–child closeness · Maternal hostility

Introduction

Adolescent problem behaviors (referring to both externalizing and internalizing problems) have been the subject of research for decades as they have serious concurrent and long-term negative consequences for adolescents themselves and to society (Moore et al., 2014; Piquero et al., 2012; Yonas et al., 2005). Several theories and empirical

studies point to parenting behaviors as important determinants that influence the development of adolescent problem behaviors¹ (e.g., Reid et al., 2002; Yang et al., 2023). Among these, parental engagement with children has emerged as critically important for positive development across an array of individual and contextual strata (e.g., Amato & Fowler, 2002). Only a few studies, however, have investigated whether parental engagement during childhood specifically has a long-term impact on problem behaviors during adolescence (Gold et al., 2020). Importantly, no prior studies have investigated the unique associations of mother and father engagement on adolescent externalizing and internalizing behavior problems. For example, does father engagement during early childhood matter for adolescent problem behaviors above and beyond maternal engagement? It is unclear whether and to what extent there

✉ Panpan Yang
py5452@princeton.edu

¹ Center for Research on Child and Family Wellbeing, Princeton University, Princeton, NJ, USA

² Department of Educational and Counseling Psychology, University at Albany, SUNY, Albany, NY, USA

¹ Problem behaviors in this study refer to both externalizing and internalizing problem behaviors.

are unique associations of mother and father engagement with adolescent problem behaviors. This study aims to address this question and investigates the unique longitudinal associations of mother and father engagement during middle childhood with adolescent problem behaviors.

Parent Engagement and Its Association with Adolescent Problem Behaviors

According to Lamb et al. (1987), parent engagement involves interaction, availability, and responsibility. Interaction means direct contact with children through caretaking and shared activities; availability refers to parental presence or accessibility; and responsibility represents other activities that ensure the children are taken care of, such as arranging for caregivers and making medical appointments. Though all three aspects of parent engagement are supposed to relate to children's development, most of the research in this field investigated interaction and/or availability of parent engagement and found some relationships between these two aspects of parent engagement and children's outcomes (e.g., Fagan & Wildfeuer, 2022; Gold et al., 2020). Moreover, greater parent–child interaction has been found to benefit children more than parents who are solely present (i.e., availability; Adamsons & Johnson, 2013). To align with the existing literature, the current study focuses on both interaction and availability components of parent engagement. A review of this literature, focused on parent engagement (i.e., both interaction and availability) and children's problem behaviors, is discussed below.

Several empirical studies have found that parental engagement is protective against children's problem behaviors wherein children with more engaged parents tend to have fewer problem behaviors (see Amato & Fowler, 2002; Baker et al., 2018; Mincy et al., 2016). Although this research suggests that increasing parental engagement may reduce problem behaviors and, indeed, some interventions have found this link (e.g., Sanders et al., 2000), there are several limitations within this body of research. First, most empirical studies have examined the effects of parent engagement on children's outcomes during childhood; few studies have examined adolescent outcomes. In addition, the findings from studies focused on outcomes during childhood are inconsistent. For example, one study examined the moderation effects of parent engagement on the associations between child outcomes at age 9 (i.e., social skills and internalizing and externalizing behaviors) and parents' additive risk (e.g., unemployment, low educational attainment, depression) during early childhood (from age 1 to 5; Fagan & Wildfeuer, 2022). The results on engagement showed that more paternal engagement with children during early childhood was significantly associated with fewer

externalizing behaviors at age 9. Mother engagement, however, was not linked with any of these child outcomes at age 9. Similar findings were discovered in another study such that father engagement, rather than mother engagement, had protective effects against children's problem behaviors (Chang et al., 2007). However, one study examined the relationship between children's problem behaviors at ages 5 to 9 with mother and father engagement prior to 5 ages old (Aldous & Mulligan, 2002). They found that neither mother nor father engagement was related to children's problem behaviors.

A second limitation of the parental engagement literature is that although only one analysis, to our knowledge, has explored the long-term effects of parental engagement during childhood on adolescent behavior problems, and this existing study has focused only on paternal engagement. Specifically, the study examined the association between fathers' engagement in middle childhood and adolescent behavior problems at age 15 and found that paternal engagement was associated with fewer adolescent internalizing and externalizing behaviors (Gold et al., 2020). The study by Gold et al. (2020), however, did not include maternal engagement. They did not investigate mother engagement or its association with adolescent problem behaviors and when examining father engagement, the study did not control mother engagement. Yet, according to family systems theory, parents are an interdependent subsystem of the family and mutually influence each other as well as all other members of the family (Cox & Paley, 1997; Campbell, 2023). As a result, the quality, type, and amount of engagement of one parent, as well as its impact, may depend on the other parent's engagement. To our knowledge, none of the existing studies focusing on parent engagement and adolescent outcomes have tested the unique effects of mother or father engagement while controlling for the other parent's engagement. To better understand the unique contribution of one parent's engagement on adolescents, the other parent's engagement should be considered. The current study attempts to uncover the independent associations of mother and father engagement with adolescent problem behaviors by simultaneously controlling the other parent engagement.

Possible Indirect Associations of Parent Engagement with Adolescent Problem Behaviors via Parent–Child Relationships

In addition to the direct associations of parent engagement on child and adolescent problem behaviors, parent engagement may have indirect associations as well. Parent–child relationships (e.g., closeness, hostility) are salient factors influencing children's behaviors (Flouri & Buchanan, 2002; Fosco et al., 2014; Schlomer et al., 2015).

It is possible that one result of greater parent engagement is enhanced relationship quality between parents and their children (Piskernik & Ahnert, 2019), which may further reduce children's behavior problems. Though the association between the quantity of parental engagement and children's outcomes has not been consistently found (e.g., Aldous & Mulligan, 2002 versus Fagan & Wildfeuer, 2022), the quality of parental engagement has been consistently found to impact children's behavior problems (Pinquart, 2017). As a result, mother and father engagement may be indirectly associated with children's behavior problems via increasing the quality of parent–child relationship. However, no empirical studies have investigated these possible indirect associations, leading to a third limitation of the existing research in this field. Taken together, to fully understand the association of parent engagement with adolescent problem behaviors, both direct and indirect associations as well as mother and father engagement should be considered, and the current study attempts to do so.

Importance of Understanding both Mother Engagement and Father Engagement

Family systems theories emphasize that mothers and fathers are essentially different in terms of their roles and power in the family (Cox & Paley, 1997; Campbell, 2023). Given the cultural and societal differences in attitudes and policies toward fathers and mothers, most mothers play a larger caregiver role in the family than fathers and tend to be more engaged with their children in daily activities. Most fathers are seen as the breadwinner and are less involved in caregiving (Lengermann and Niebrugge-Brantley, 2004). Even with the same degree of parent engagement, the processes, meanings, and outcomes are often different between mothers and fathers (Feiring & Lewis, 1996) due to the essential differences in terms of roles and dynamics as well as different expectations from children. Thus, to fully understand parent engagement, it is important and necessary to explore both mother and father engagement. In addition, as previously mentioned, mothering and fathering within a family influence each other (Cox & Paley, 1997; Campbell, 2023). How mother and father engagement relate to children's outcomes may depend on the other parent's engagement and prior research indicates that mother and father engagement is positively associated (Lamb et al., 1987). Thus, examining only one parent's engagement risks overestimating the relation between that parent's engagement and youth outcomes. In addition, the overall association between parental engagement and youth outcomes is likely smaller when only one parent is evaluated. Thus, to get a clearer and more holistic view of parental engagement, both parents' engagement should be considered when

investigating parental engagement. Despite these limitations, no existing research has been conducted that focuses on adolescent problem behaviors.

Potential Different Associations of Parent Engagement with Children's Behaviors across Marital Relationship Types

Family stress models assume that contextual factors, such as family structure, may impact the effects of parental engagement on child outcomes (Barnett, 2008). By 2004, approximately 40% of all births were to unmarried women (Hamilton et al., 2015); as rates of cohabitation and non-marital childbirths increased in the US at the end of the 20th century, this family form became more normative. In addition, increasingly, men and women are caring for children in cohabiting relationships, which have historically been less stable than marital relationships (Daugherty & Copen, 2016). This precarity may impact the amount of time and quality of engagement parents have with their children. Additionally, if a cohabiting relationship ends, fathers are not guaranteed visitation rights (whereas these rights are standard for divorced fathers). Thus, children with cohabiting parents are less likely to be close to their fathers if the cohabiting relationship ends. Research in this area has shown that married parents' relationships tend to be more stable and committed compared to parents who are cohabiting (Barnett, 2008; Osborne et al., 2007).

Two parent married couples tend to have higher household incomes and greater levels of parental education compared to cohabiting couples with children (Edin & Reed, 2005). In the married couple families, children may get more resources from their parents and parents may also have more time and be more willing to devote to their children's development, including more parent engagement (Kearney, 2023). Additionally, married parents may have more disposable income they can use to free up their time to spend more time with their children. Moreover, in married couple families, parents are more likely to interact positively with their child (Rosenkrantz Aronson & Huston, 2004), which may improve the relationship quality between parents and their child. Thus, the potential higher levels of parent engagement as well as better parent–child relationship quality in the married couple families may result in a stronger association with children's problem behaviors than in the cohabiting couple families. However, no empirical studies investigated whether and to what extent the associations of parental engagement with children's behaviors differ in married and cohabiting relationships. To fill in this gap, the current study attempts to explore the potential differences in the associations of parental engagement with adolescents' problem behaviors between married and cohabiting families.

Gender Differences

There are well-established sex differences in the prevalence of externalizing and internalizing behavior problems (Martel, 2013). Generally speaking, boys are more likely to manifest externalizing behavior problems compared to girls, while girls are more prone to internalizing symptoms (Broidy et al., 2003; Caspi et al., 2014). Additional research suggests that parenting may have greater effects on children within same-gender dyads (e.g., mothers on daughters and fathers on sons), while other studies have found evidence for unique cross-gender effects (Goagoses et al., 2022). Studies on mother and father engagement and possible differential impacts on child behavior problems based on the children's sex have not been conducted, however. As they move toward adolescence, boys tend to perceive more pressure to conform to traditional gender roles (Crouter et al., 2007), which may prompt boys to value fathers' contributions more than mothers'. Thus, their behavior may be particularly responsive to paternal engagement. Some empirical studies partly support this notion (e.g., Aldous & Mulligan, 2002; Gold et al., 2020). However, little is known about how the impacts of mothers' engagement differ by children's gender. This study attempts to explore gender differences in the impact of both paternal and maternal engagement by child sex.

Current Study

Little knowledge is known about the unique contributions of both mother and father engagement on adolescent problem behaviors. To fill in this gap, this study examines the unique direct and indirect long-term associations of mothers' and fathers' engagement during mid-childhood on adolescent boys' and girls' problem behaviors. Because the existing literature on the associations among younger children has been somewhat inconsistent, and because many studies of mother/father engagement do not account for the other parent's engagement, no specific hypotheses on whether maternal and paternal engagement will have a direct association with adolescent behaviors were formed. However, this study hypothesizes that both parents' engagement will have indirect associations with adolescent behaviors via the quality of parent-child relationships. In addition, due to the inconsistency of the prior literature, specific hypotheses about whether same-gender dyad relationships will see stronger associations than cross-gender dyad relationships were not formed. However, this study hypothesizes that parent engagement will have stronger associations in the married than in the cohabiting relationships.

Methods

Data and Participants

Data from the Future of Family and Child Wellbeing study (FFCWS: <https://ffcws.princeton.edu/>) were used in the current study. The FFCWS is an ongoing large-scale longitudinal study. It has followed and collected data at the birth of 4898 children born in 20 large U.S. cities between 1998 and 2000, and when children were ages 1, 3, 5, 9, and 15. It is an at-risk sample with a 3:1 oversample of births to unmarried parents. However, when weighted, the sample is representative of all births in the US between 1998 and 2000. As is convention in many FFCWS papers, four baseline variables, which are mother's age, mother's educational level, mother's race, and mother-father marital relationship, were controlled in this study to create the weights, making the estimates nationally representative. At each interview wave, different surveys, such as primary caregiver survey, mother/father survey, teen survey, were conducted (for more details, please review <https://ffcws.princeton.edu/data-and-documentation/public-data-documentation>).

For this study, because the association of parenting behaviors in middle childhood with adolescent behavior problems is the interest, the data from age 9 and age 15 were used. Specifically, at age 9, children themselves, fathers, and primary caregivers (i.e., people who live with the focal child at least half of the time, defaulting to the mother if the child lived with both parents at this age) each completed their own surveys. At age 15, primary caregivers completed the survey. The mother engagement and hostility data at age 9 were from the primary caregiver survey limited to the primary caregivers who were biological mothers (i.e., mothers living with the child at least half of the time). The father engagement and hostility data at age 9 were from the father survey limited to fathers living with the child at least half of the time. Both mother-child closeness and father-child closeness data were from the child survey. As a result, the analytic sample for this study was $N = 1349$.

All measured parenting behaviors were from the age 9 data, and the outcome variables were from the age 15 data. Across the age 9 and age 15 surveys, less than 9% of data were missing. In addition, the comparisons at age 9 between families with and without age 15 data did not differ on mother/father engagement, maternal/paternal hostility, or mother-child closeness. However, it was found that fathers with missing data at age 15 were more likely to report lower levels of father-child closeness than fathers without missing data ($t(1249) = 3.73, p < 0.001$). Missing data in this study were handled using full information maximum likelihood estimation (Schafer & Graham, 2002).

Measures

Parent Engagement

Parent engagement was measured by assessing parental participation in developmentally appropriate activities (Cabrera et al., 2004). It included both interaction and availability of parent engagement defined by Lamb et al. (1987). A total of 10 items were included at age 9. These items have been widely used to measure parent engagement (e.g., Fagan, 2022; Gold et al., 2020). Example items included in the past month, how often you played sports or did outdoor activities together or watched TV or videos together with your child. Response choices included not once in the past month, 1–2 times in the past month, at least once a week, several times a week, and every day (coded from 0 to 4). Primary caregivers and fathers answered these questions separately about their own behaviors. All 10 items from mothers as the primary caregivers were used and averaged to represent the mother engagement. All items from fathers were averaged to get the father engagement. Higher values mean more parental engagement. The alpha reliabilities for mothers' and fathers' engagement were 0.68 and 0.79, respectively.

Parent–Child Closeness

At age 9, children reported their closeness to their mothers and fathers, respectively. One Likert-scaled item asked how close the child felt to his or her mother and father (1 = extremely close to 4 = not very close). This item was recoded so that higher scores mean a closer relationship. This measure has been used in several empirical studies and demonstrates strong validity (e.g., Gold et al., 2020; Knoester & Randolph, 2019).

Parental Hostility

Parental hostility was measured by assessing a parent's psychological aggression towards their child (Straus et al., 1998). There were five items including: in the past year, how often you have shouted, yelled, or screamed at child, or threatened to spank or hit the child but didn't actually do it. The responses included never in the past year, once, twice, 3–5 times, 6–10 times, 11–20 times, and more than 20 times. Primary caregivers (limited to mothers who are the primary caregivers) and fathers each answered these five items about their own behaviors. Similar with mother engagement, items from mothers were averaged to create maternal hostility scores. The averaged scores from fathers were used to generate paternal hostility scores. Higher scores indicate higher levels of parental hostility. The alpha reliability across items was 0.67 for mothers, and 0.61 for fathers.

Adolescent Behavior Problems

Externalizing Behavior Problems Externalizing behavior problems were measured using the items from the rule-breaking and aggressive behavior subscales of the Child Behavior Checklist (CBCL; Achenbach and Al Rescorla, 2001). The primary caregiver reported on these items at age 9 and age 15. Externalizing behavior problems at age 9 were included in current study as a control variable to test the change of behavior problems. Given developmental changes between these ages, different items are included in age 9 and age 15 externalizing problem behaviors (Achenbach and Al Rescorla, 2001). Externalizing behaviors include items from the rule-breaking and aggressive behavior subscales. In total, at age 9 there were 17 items from the rule-breaking behavior subscale and 18 items from the aggressive behavior subscale. At age 15, a total of 20 items (9 items for rule-breaking behavior and 11 items for the aggressive behavior) were included. The items were scored on a 0 = not true, 1 = sometimes true, and 2 = often true scale. Example items for rule-breaking behavior included running away from home and stealing outside the home, and example items for the aggressive behavior included physically attacking people and destroying things belonging to the family or others. The averaged scores of rule-breaking and aggressive behaviors were used to represent externalizing behavior problems. Alpha reliabilities of these items were 0.90 and 0.86 at age 9 and age 15, respectively.

Internalizing Behavior Problems All items from the anxious/depressed behavior and withdrawn subscales of CBCL were used to measure the internalizing behavior problems (Achenbach and Al Rescorla, 2001). Given the developmental changes, different items are included in age 9 and age 15 internalizing problem behaviors (Achenbach and Al Rescorla, 2001). At age 15, a total of 8 items (6 items for anxious/depressed behavior and 2 items for withdrawn) were included. Similar to externalizing behavior problems, primary caregivers reported on the items. Internalizing behavior problems at age 9 were included as a control variable to examine the change of behavior problems. Answer choices ranged from 0 (not true) to 2 (often true). Example items for anxious behavior included feeling worthless or inferiority and crying often, and for withdrawn included being underactive, slow moving, or lacking energy. The averaged scores of anxious/depressed behaviors and withdrawn were used to represent the internalizing behavior problems. Alpha reliabilities of these items were 0.83 at age 9 and 0.74 at age 15.

Group (Stratification) Variables

Due to the gender differences in externalizing and internalizing behavior problems, all models were further

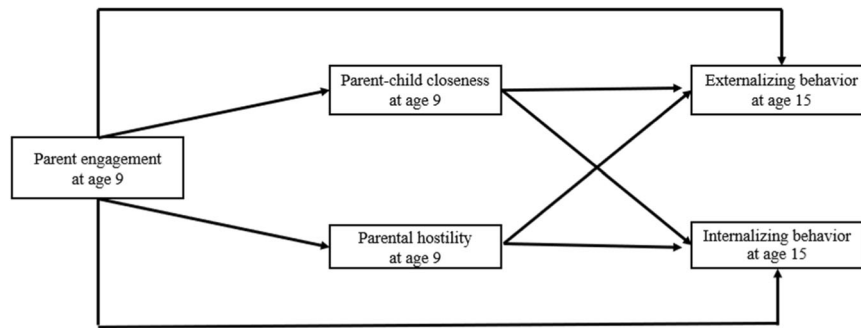


Fig. 1 Theoretical Model of the Current Study. *Note.* Mothering and fathering were tested separately. Specifically, when testing the associations of mothering, (1) mother–child closeness, mother engagement, and maternal hostility at age 9 were included in the model; and (2) father engagement at age 9, child problem behaviors at age 9 and four variables at baseline (mother’s age, mother’s educational level, mother’s race and mother–father marital status) were controlled.

grouped by child gender (52% boys and 48% girls). Given the potential differential effects of maternal and paternal parenting on child behavior problems among married and cohabiting parents, this study also examined all the models grouped by mother–father marital status at age 9 (68% married status versus 20% cohabiting status; the remaining 12% were others or missing status).

Control Variables

Four variables at baseline that were related to the sample representativeness were controlled for in all models in this study: (1) mother’s age at baseline ($Mean = 27$ ages old, $SD = 6.17$), (2) mother’s educational level at baseline (26% less than high school, 27% high school or equivalent, 27% some college or technique certificate, and 20% college or higher), (3) mother’s race (31% non-Hispanic white, 34% non-Hispanic black, 31% Hispanic, and 4% others), and (4) mother–father marital status (44% married, 37% cohabiting, and 19% others). In addition, the lagged dependent variables, which were externalizing behavior problems and internalizing behavior problems at age 9, were also controlled in all models.

Analytical Plan

Structural equation models were used to test the direct and indirect longitudinal associations of mother and father engagement with adolescent behavior problems. Figure 1 depicts the basic theoretical model. First, the basic model on the entire sample was run for mother and father engagement, separately. When running the model for mothers or fathers, the other parent’s engagement, child externalizing and internalizing problem behaviors at age 9, and the four control variables at baseline (i.e., mother’s age, mother’s race, mother’s educational level, and mother–father marital

status) were controlled by including them as exogenous predictors of externalizing and internalizing. To test indirect associations, bootstrapping with $N = 1000$ iterations was used to estimate parameters and 95% confidence intervals (MacKinnon et al., 2004). Parameter reliability is evidenced when the 95% confidence intervals in the bootstrapped results do not include zero.

Similarly, when testing the associations of fathering, (1) father–child closeness, father engagement, and paternal hostility at age 9 were included in the model; and (2) mother engagement at age 9, child problem behaviors at age 9 and four variables at baseline (mother’s age, mother’s educational level, mother’s race, and mother–father marital status) were controlled

status) were controlled by including them as exogenous predictors of externalizing and internalizing. To test indirect associations, bootstrapping with $N = 1000$ iterations was used to estimate parameters and 95% confidence intervals (MacKinnon et al., 2004). Parameter reliability is evidenced when the 95% confidence intervals in the bootstrapped results do not include zero.

Second, to test the gender differences and marital status differences, multigroup structural equation models were run using child gender and mother–father marital status as grouping variables. For each, only one grouping variable was added to the basic model. As a result, a total of four models were run at this step: (1) mother model with child gender as a grouping variable, (2) mother model with mother–father marital status as a grouping variable, (3) father model with child gender as a grouping variable, and (4) father model with mother–father marital status as a grouping variable. Last, chi-square tests were used to determine the significance of group differences. Specifically, the significant coefficients in each multigroup model were constrained to be the same between boys and girls and between married and cohabiting families. The chi-square difference between the unconstrained (i.e., basic multigroup model) and constrained models was calculated to test whether the group differences were significant. The group differences test was done for all the four models in the second step. All models were run in Mplus (Muthen & Muthen, 1998–2017).

Results

Preliminary Analyses

Descriptive statistics for the core measures are summarized in Table 1. A series of paired sample t -tests show that

Table 1 Descriptive Statistics for the Measures

	Boys (<i>n</i> = 704)	Girls (<i>n</i> = 645)	Married families (<i>n</i> = 922)	Cohabiting families (<i>n</i> = 270)	Overall (<i>N</i> = 1349)
Baseline					
Mother age (mean in years)	27	27	28	25	27
Mother educational level, <i>n</i> (%)					
Less than high school	189 (27%)	163 (25%)	184 (20%)	123 (45%)	352 (26%)
High school or equivalent	194 (28%)	169 (26%)	226 (25%)	83 (31%)	363 (27%)
Some college or technique certificate	178 (25%)	184 (29%)	259 (28%)	56 (21%)	362 (27%)
College or higher	142 (20%)	129 (20%)	252 (27%)	8 (3%)	271 (20%)
Mother race, <i>n</i> (%)					
Non-Hispanic white	219 (31%)	198 (31%)	350 (38%)	36 (13%)	417 (31%)
Non-Hispanic black	230 (33%)	226 (35%)	253 (27%)	115 (43%)	456 (34%)
Hispanic	217 (31%)	197 (31%)	265 (29%)	117 (43%)	414 (31%)
Others	37 (5%)	21 (3%)	51 (6%)	2 (1%)	58 (4%)
Mother–father marital status, <i>n</i> (%)					
Married	322 (46%)	273 (42%)	568 (62%)	3 (1%)	595 (44%)
Cohabiting	261 (37%)	244 (38%)	261 (28%)	176 (65%)	505 (37%)
Others	121 (17%)	128 (20%)	93 (10%)	91 (34%)	249 (19%)
Mean (Standard Deviation)					
Age 9					
Mother engagement	2.66 (0.53)	2.71 (0.56)	2.70 (0.51)	2.64 (0.58)	2.68 (0.54)
Father engagement	2.47 (0.71)	2.36 (0.71)	2.42 (0.67)	2.43 (0.76)	2.41 (0.71)
Mother–child closeness	3.63 (0.70)	3.69 (0.67)	3.69 (0.65)	3.54 (0.81)	3.66 (0.69)
Father–child closeness	3.51 (0.81)	3.63 (0.69)	3.61 (0.70)	3.47 (0.88)	3.57 (0.76)
Maternal hostility	1.37 (0.99)	1.24 (0.99)	1.28 (0.96)	1.39 (1.05)	1.31 (0.99)
Paternal hostility	1.28 (1.05)	1.05 (0.95)	1.18 (0.98)	1.29 (1.10)	1.17 (1.01)
Child externalizing behavior	0.16 (0.19)	0.13 (0.17)	0.14 (0.16)	0.18 (0.21)	0.15 (0.18)
Child internalizing behavior	0.17 (0.20)	0.17 (0.18)	0.16 (0.17)	0.20 (0.22)	0.17 (0.19)
Age 15					
Child externalizing behavior	0.18 (0.20)	0.16 (0.21)	0.15 (0.18)	0.21 (0.25)	0.17 (0.21)
Child internalizing behavior	0.22 (0.25)	0.26 (0.30)	0.22 (0.26)	0.27 (0.29)	0.24 (0.28)

mother engagement, mother–child closeness, and maternal hostility were significantly higher than father engagement ($t(1322) = 12.33$, $p < 0.001$), father–child closeness ($t(1242) = 3.93$, $p < 0.001$), and paternal hostility ($t(1180) = 3.72$, $p < 0.001$). This indicates that mothers demonstrated a higher quantity of engagement than fathers, on average. And the relationship between mothers and children tends to be closer than the relationship between fathers and children. However, mothers also reported more hostility behaviors towards their children than fathers. The correlation results (see Table 2) showed that mother

engagement was significantly and negatively associated with maternal hostility ($r = -0.08$, $p < 0.01$), and father engagement was significantly and positively associated with father–child closeness ($r = 0.07$, $p < 0.05$). All parenting behaviors except paternal hostility at age 9 were significantly associated with child internalizing problem behaviors at age 15 and all parenting behaviors except mother engagement at age 9 were significantly associated with child externalizing problem behaviors at age 15 ($-0.06 \leq r \leq 0.24$, $p < 0.05$). All the significant associations between parenting and children’s problem behaviors were at

Table 2 Correlations between Core Measures

	1	2	3	4	5	6	7	8	9	10
1. Mother engagement at age 9	\									
2. Father engagement at age 9	0.21***	\								
3. Mother–child closeness at age 9	0.05	0.07*	\							
4. Father–child closeness at age 9	0.06*	0.07*	0.40***	\						
5. Maternal hostility at age 9	−0.08**	0.002	0.03	−0.04	\					
6. Paternal hostility at age 9	0.03	0.01	−0.002	−0.04	0.29***	\				
7. Child externalizing behavior at age 9	−0.03	−0.04	−0.06*	−0.11***	0.36***	0.16***	\			
8. Child internalizing behavior at age 9	−0.06*	−0.06*	−0.05	−0.04	0.18***	0.01	0.64***	\		
9. Child externalizing behavior at age 15	−0.04	−0.06*	−0.07*	−0.11***	0.24***	0.11***	0.46***	0.16***	\	
10. Child internalizing behavior at age 15	−0.06*	−0.13***	−0.06*	−0.09**	0.13***	0.01	0.29***	0.30***	0.47***	\

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

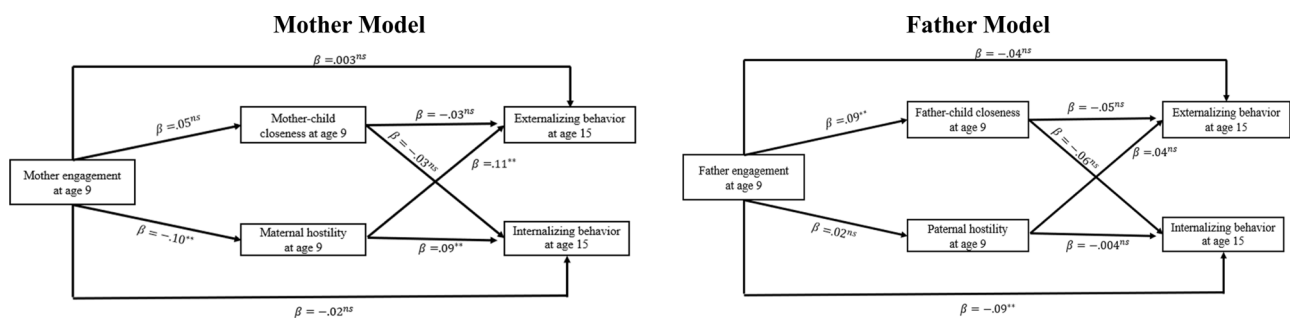


Fig. 2 Direct and Indirect Associations of Parent Engagement with Adolescent Problem Behaviors for All Sample. *Note.* In the two models, the other parent engagement at age 9, child problem behaviors at age 9, and four control variables at baseline (mother’s age, mother’s

educational level, mother’s race, and mother–father marital status) were controlled. *ns* = not significant, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

the expected direction, such that more parent engagement and parent–child closeness was associated with fewer adolescent problem behaviors, while more parental hostility was related to more adolescent problem behaviors.

The correlations between the parenting measures ranged from 0.002 to 0.40 (see Table 2), indicating that there were no multicollinearity issues when adding all the parenting behaviors to one model.

Mother Model

While controlling father engagement and child problem behaviors at age 9 as well as four baseline control variables, mother engagement at age 9 did not have a significant direct association with adolescent problem behaviors. However, mother engagement at age 9 had a significant bootstrapped indirect association with adolescent externalizing and internalizing behaviors at age 15 via maternal hostility (see Fig. 2 – Mother Model). Higher mother engagement was associated with less maternal hostility ($\beta = -0.10$, $p < 0.01$), which further predicted fewer adolescent externalizing behaviors ($\beta = 0.11$, $p < 0.001$) and internalizing behaviors ($\beta = 0.09$, $p < 0.01$).

The multigroup models indicate that this indirect association was only found for boys and in the context of married families. Specifically, as shown in Fig. 3 – Mother Model, for boys, more mother engagement was associated with less maternal hostility ($\beta = -0.15$, $p < 0.001$), which further predicted fewer internalizing behaviors ($\beta = -0.09$, $p < 0.05$), though this indirect association was not found for girls. The indirect association of mother engagement on adolescent problem behaviors via maternal hostility was fully replicated in the context of married families (see Fig. 4 – Mother Model). However, no direct or indirect associations between mother engagement and adolescent problem behaviors were found in the cohabiting families.

Father Model

Unlike mother engagement, father engagement at age 9 had a direct association with adolescent internalizing behaviors at age 15 ($\beta = -0.09$, $p < 0.01$; see Fig. 2 – Father Model), while controlling for mother engagement and child behavior problems at age 9 as well as the other four baseline control variables. More father engagement at age 9 was associated with fewer adolescent internalizing behaviors at age 15. This

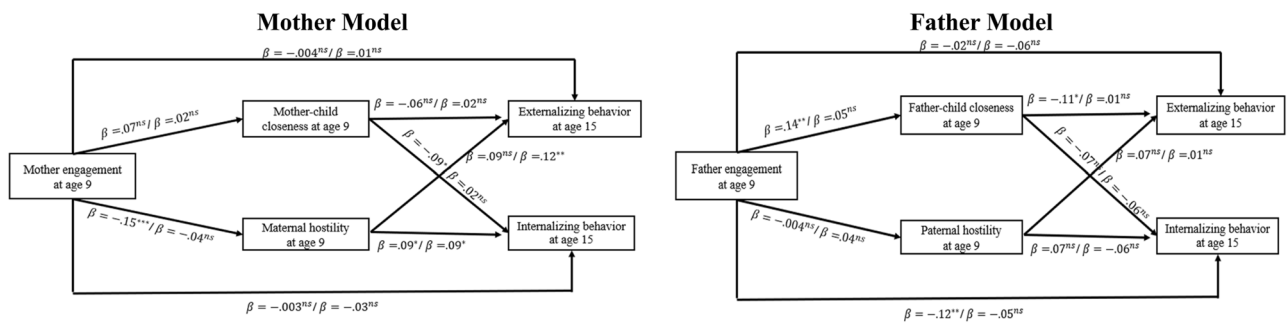


Fig. 3 Direct and Indirect Associations of Parent Engagement with Adolescent Problem Behaviors Grouped by Child Gender. *Note.* In the two models, the other parent engagement at age 9, child problem behaviors at age 9, and four control variables at baseline (mother’s age,

mother’s educational level, mother’s race, and mother–father marital status) were controlled. The coefficients on the left of the slash were boys, and the coefficients on the right of the slash were girls. *ns* = not significant, **p* < 0.05, ***p* < 0.01, ****p* < 0.001

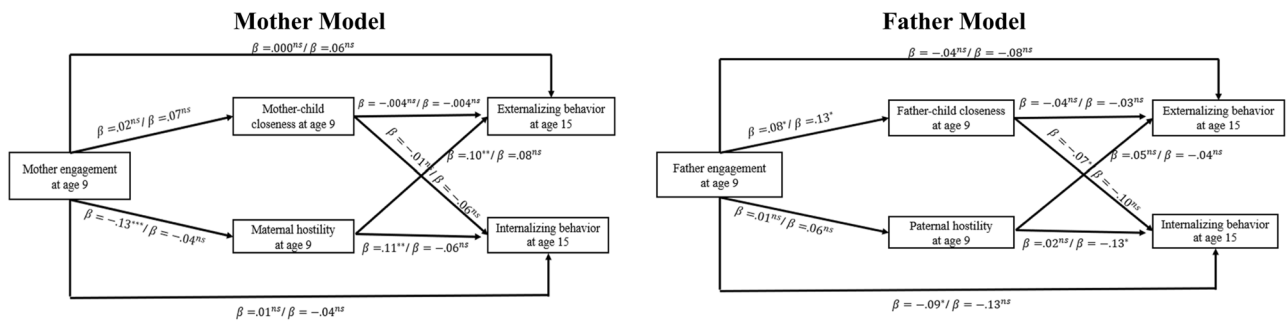


Fig. 4 Direct and Indirect Associations of Parent Engagement with Adolescent Problem Behaviors Grouped by Marital Status. *Note.* In the two models, the other parent engagement at age 9, child problem behaviors at age 9, and four control variables at baseline (mother’s age,

mother’s educational level, mother’s race, and mother–father marital status) were controlled. The coefficients on the left of the slash were married families, and the coefficients on the right of the slash were cohabiting families. *ns* = not significant, **p* < 0.05, ***p* < 0.01, ****p* < 0.001

significant association was confirmed in the bootstrapping results by having 95% confidence intervals without including zero.

The multigroup models show that this direct association was only found for boys and only among married families (see Fig. 3– Father Model and Fig. 4 – Father Model, respectively). In addition, for boys, indirect effects showed father engagement was indirectly related to adolescent externalizing behaviors via father–child closeness (see Fig. 3 – Father Model). More father engagement was associated with higher levels of father–child closeness ($\beta = 0.14, p < 0.01$), which was further associated with fewer subsequent adolescent boys’ externalizing behaviors ($\beta = -0.11, p < 0.05$). Among married families, father engagement had an indirect association on adolescent internalizing behaviors via father–child closeness (see Fig. 4 – Father Model). More father engagement was associated with higher levels of father–child closeness ($\beta = 0.08, p < 0.05$), which was further related to fewer subsequent internalizing behaviors ($\beta = -0.07, p < 0.05$). In sum, father engagement at age 9 was found to have both direct and indirect associations with adolescent problem behaviors for boys and within married families.

Chi-Square Test for the Significance of Group Differences

Gender Differences

The chi-square difference between the unconstrained (i.e., basic multigroup model) and constrained (i.e., by having the significant coefficients constrained to be equal between boys and girls) models was calculated. The results of chi-square difference, for both mother and father models, indicate the gender differences were significant (for mother model: $\Delta\chi^2(15) = 345.99, p < 0.001$; for father model: $\Delta\chi^2(11) = 332.89, p < 0.001$).

Marital Status Differences

The chi-square test indicates that, for both mother and father models, the differences between cohabiting and married families were significant as evidenced by the significant chi-square difference between the constrained and unconstrained models (for mother model: $\Delta\chi^2(13) = 294.19, p < 0.001$; for father model: $\Delta\chi^2(11) = 166.72, p < 0.001$).

Sensitivity Analyses

To test the robustness of the results, two sensitivity tests were done. First, as household income may be associated with the levels of mother and father engagement (McLanahan & Percheski, 2008), household income at age 9 was added to all the models as a covariate. The results were unchanged after adding household income. Second, as adolescent externalizing and internalizing problem behaviors are the interests of this study, the outcomes from the primary caregiver-reported data were used in the current study. There are no teen-reported externalizing and internalizing problem behaviors from CBCL in FFCWS (i.e., Youth Self-Report). However, FFCWS has a teen-reported depression measure from the Center for Epidemiologic Studies Depression Scale and teen-reported anxiety measure drawn from the Brief Symptom Inventory 18. When using teen-reported depression as the outcome, the same results for both the mother and father models were obtained. However, the results for teen-reported anxiety were not fully replicated, such that no significant associations in the mother model were found and only the indirect association of father engagement with adolescent anxiety via father–child closeness was found. Because parent-reported internalizing behaviors in this study include both depression and anxiety as well as withdrawn behaviors, the parent-reported measures have much more variance than the teen-reported depression or anxiety measures. Thus, more significant results would be expected for parent-reported measure of internalizing behaviors than teen-reported depression or anxiety measures. Taken together, two sensitivity tests indicate the results in the current study were robust.

Discussion

Parenting behaviors have been hypothesized to play a critical role in influencing adolescent problem behaviors by several studies (e.g., Reid et al., 2002; Yang et al., 2023). However, knowledge on the longitudinal effects of parent engagement during childhood on adolescent problem behaviors is limited. Most research on parent engagement focuses on young children’s problem behaviors (e.g., Chang et al., 2007; Fagan & Wildfeuer, 2022) and, importantly, no existing studies have investigated the potential indirect association of parent engagement with adolescent outcomes. To fill this gap, the current study used longitudinal data from FFCWS to shed light on the potential direct and indirect associations of mother and father engagement with adolescent externalizing and internalizing behaviors. These associations were further examined for adolescent boys and girls, and for adolescents in married and cohabiting

families, to explore the potential differences by children gender and marital status.

Importance of Father Engagement on Reducing Adolescent Boys’ Internalizing Behaviors

Consistent with some research on problem behaviors during childhood (Chang et al., 2007; Fagan & Wildfeuer, 2022), greater father engagement, rather than mother engagement, was found to have a direct association with lower levels of adolescent internalizing behaviors. One possible reason may be due to the roles that mothers and fathers play in the family. Though there have been some relatively recent changes, most mothers play a larger caregiver role in the family than most fathers do (Lengermann and Niebrugge-Brantley, 2004). It is possible that children may take for granted mother engagement. However, father engagement is more incongruous with the father role for children and may thus be more valued.

Interestingly, the direct association between father engagement and adolescent internalizing behaviors was only found for adolescent boys. This finding is partly consistent with prior research that found paternal parenting was more important for adolescent boys in predicting adolescent problem behaviors (Yang et al., 2022). Fathers are more likely to be involved with their same- than opposite-sex children (Raley & Bianchi, 2006). In addition, boys at the transition to adolescence tend to feel more pressure to conform to traditional gender roles (Crouter et al., 2007), which may prompt boys generate greater attachment to their fathers; accordingly, father–son relationships may take on a more significant role in male adolescents’ lives.

Indirect Associations of Mother Engagement via Maternal Hostility and Father Engagement via Father–Child Closeness with Adolescent Problem Behaviors

Though mother engagement was not found to have a direct association with adolescent problem behaviors when controlling for father engagement and other factors, mother engagement was found to have an indirect association through maternal hostility. More mother engagement was associated with less maternal hostility, which further predicted fewer adolescent externalizing and internalizing behaviors. Similarly, greater father engagement was also found to have an indirect association with adolescent boys’ externalizing behaviors, though through father–child closeness. More father engagement was related to greater father–son closeness, which further predicted boys displaying fewer externalizing behaviors. This is an interesting finding. Mother engagement is more congruous with mothers’ cultural roles in the family. Thus, positive

mothering behavior may be not viewed as a benefit or extra for children and may be less likely produce more positive changes between mothers and children, such as increasing mother–child closeness. The non-significant correlation between mother engagement and mother–child closeness in this study shows evidence for this point. In contrast, father engagement is more incongruous with the cultural father role in the family; children may more likely view this positive fathering behavior as a benefit, particularly for boys, who may have more pressure to conform to traditional gender roles at this life-course stage (Crouter et al., 2007). Thus, more father engagement may indirectly impact boys' problem behaviors via enhancing father–son closeness.

Greater maternal engagement was associated with less maternal hostility, which was further associated with fewer adolescent problem behaviors. No prior literature or theory, to our best knowledge, would suggest why this is so. However, it is possible that since maternal hostility is more incongruent with mothers' cultural roles (e.g. nurturers rather than disciplinarians), maternal hostility may be particularly harmful, and may be particularly likely to lead to acting out among adolescents. In addition, more mother engagement can lead to more positive interactions between mothers and children (e.g., playing/reading together, talking with each other), which may result in less maternal hostility. This is also shown by the significant correlation between mother engagement and maternal hostility. Thus, more mother engagement would relate to fewer adolescent problem behaviors indirectly via maternal hostility. To fully understand the mechanism of this indirect association, more research is needed.

Differences between Married and Cohabiting Families

All the associations (including direct and indirect) of mother and father engagement on adolescent problem behaviors were only found in married families, rather than in the cohabiting families. The findings were consistent with the hypothesis that there would be stronger direct and indirect associations of mother and father engagement with adolescent problem behaviors in married families than in cohabiting families. It is also consistent with prior research that found the importance of married relationships on parenting and children's behaviors (Baker et al., 2018; Rosenkrantz Aronson & Huston, 2004). A married relationship is associated with more family stability and less family stress (Barnett, 2008). In this family context, parents tend to perform more positive behaviors to children (Rosenkrantz Aronson & Huston, 2004); the quality of parent–child relationship are more likely to be influenced by these positive parenting behaviors (Piskernik & Ahnert, 2019). The descriptive statistics in the current study also

imply that the parent–child relationship in married families tends to be closer than in cohabiting families, while the level of parental hostility in married families seems lower than in cohabiting families. Thus, in a married relationship, the associations of parent engagement with adolescent problem behaviors are more likely to show up directly or indirectly through enhancing parent–child relationship quality.

In addition, married status does not just mean “*marriage*” between mothers and fathers. In a married relationship, for instance, the household income and parent educational level may be higher than in other marital relationships (Edin & Reed, 2005). Parents in a married relationship may have more time to get involved in their child's development and provide more resources to their child as well, such as more parent engagement in current study. The higher levels of parent engagement may bring more benefits for a child in a married family. Taken together, though cohabiting relationships between mothers and fathers have becoming more normative, this study suggests that a married relationship is more important than a cohabiting relationship between mothers and fathers to enhance the protective impact of parent engagement against adolescent problem behaviors.

Rethinking Quantity of Parenting versus Quality of Parenting

The quality of parenting has been found to play a more important role in influencing children's problem behaviors than quantity of parenting (Fabricius et al., 2012). The quality of parenting has been consistently found to impact children's outcomes (Flouri & Buchanan, 2002; Fosco et al., 2014; Schlomer et al., 2015), while the influence of quantity is not robust (Aldous & Mulligan, 2002; Eitle, 2005). Building on the literature, this study indicates that research must move beyond questions of quantity versus quality. It is more important to consider how quantity of parenting and quality of parenting work together to influence children's problem behaviors. This study suggests that greater quantity of positive parenting can enhance the quality of parenting to further reduce adolescent problem behaviors. This finding is aligned with some prior research (Eitle, 2005).

Implications

This study found that father engagement during childhood is important above and beyond maternal engagement, and that more father engagement in middle childhood had both direct and indirect effects on adolescent internalizing behaviors at age 15. This suggests that father engagement during childhood should be encouraged by practitioners and

policymakers. What is more, *both* mother engagement and father engagement have long-term beneficial effects on reducing adolescent problem behaviors, though only indirectly for mothers. In addition to promoting father engagement, mothers should be encouraged to increase their engagement with children, which may curb expressions of hostility that may be particularly harmful to children. Importantly, this study found that these associations were held for adolescent boys and in the married families only. To reduce adolescent boys' problem behaviors, enhancing both fathers' and mothers' engagement would be helpful. Additional empirical research with a focus on adolescent girls' problem behaviors is still needed to provide evidence for best practices in interventions focusing on girls. Furthermore, these proposed evidence-based interventions on parent engagement were supported in married families only.

Limitations and Future Directions

The current study has some limitations. First, adolescent externalizing and internalizing behaviors were measured by primary caregivers' reports. However, during adolescence, children tend to pursue greater autonomy and spend less time with their parents (Larson et al., 1996). Primary caregivers may know less about their youth's problem behaviors than the youth themselves (Yang et al., 2021). Thus, adolescent externalizing and internalizing behaviors in this study may be underreported. Furthermore, all the data were from parent reports, except parent–child closeness which was child report. This might result in the method variance bias. To partly compensate for these biases, a sensitivity test was conducted using teen-reported depression and anxiety. The results were replicated for depression. However, additional studies using teen-reported externalizing and internalizing measures, not captured in the FFCWS, as well as multi-reported data for parenting are still needed and encouraged to bolster these findings.

Second, mother and father engagement in this study were measured using the same items. On the one hand, this makes the results comparable. On the other, as the nature of mothering and fathering may be different, especially given differing gender roles, using the same items to assess mother and father engagement may be poorly calibrated to capture all of the important dimensions of each role. One study, for example, pointed out that fathers tend to engage more in physical and unpredictable play with children, while mothers are more likely to engage in caretaking activities with children (Lamb & Lewis, 2004). Without capturing and measuring the differences of mother and father engagement, it is difficult to fully understand the unique influence of mother and father engagement on children's outcomes (Lamb & Lewis, 2004). Unfortunately, this limitation is very common in the existing research

focusing on the comparisons between mothering and fathering. In addition, as discussed in the Introduction, Lamb et al. (1987) proposed three characteristics of parent engagement, which are interaction, availability, and responsibility. The current study measured and examined two aspects (i.e., interaction and availability) of parent engagement. Further work is encouraged to investigate the other aspect of parent engagement.

Third, parent–child closeness at age 9 in the FFCWS data was measured using a single item, which may not capture all aspects of close relationship between parent and child. In particular, for mothers as the primary caregivers, the close relationship between mothers and their children may be reflected in more aspects of parenting compared to fathers and as a result may not capture the breadth of mother–child closeness. Further research is needed to replicate the current study using a nuanced measure for parent–child closeness by including more aspects. Additionally, the somewhat low internal consistency for the parental hostility measures in current study should be mentioned, though it may indicate that the parental hostility items used in this study are better conceptualized as an additive scale than a latent measure. Furthermore, given the data limited, parent engagement as well as parent–child closeness and parental hostility were measured at the same time (age 9). It is possible that direction from parent engagement to parent–child closeness and parental hostility may not be tested clearly. Future research is recommended to test indirect associations of parent engagement with adolescent problem behaviors via parent–child closeness and parental hostility using three-time points.

Fourth, the analytic sample in this study was mothers and fathers who live with their child at least half of the time. The amount of time parents had contact may be associated with parenting (Gold et al., 2020). Thus, the amount of time parents had contact may be an important factor. Future research is recommended to include this factor as a control variable or conceptual variable to better understand parent engagement. Last, the current study used data from FFCWS. The analytic sample was limited to residential mothers and fathers, given the research interest focusing on unique contributions of mothers and fathers and making the other parent engagement controlling comparable. Thus, the findings in the current study may not generalize to non-residential parents. Additionally, the current study examined the longitudinal associations between parent engagement and adolescent problem behaviors. Interpretations beyond the correlation, such as causality, cannot be warranted.

Conclusion

There is limited knowledge on the longitudinal associations between parent engagement during childhood and

adolescent problem behaviors. No existing research investigated the potential indirect longitudinal associations between parent engagement and adolescent problem behaviors via parent–child relationships. Thus, the current study attempts to fill in this gap by examining mother and father engagement, separately. Mother engagement was found to only have an indirect longitudinal association with adolescent problem behaviors via maternal hostility. Whereas father engagement was found to have both a direct association with adolescent problem behaviors as well as an indirect association via father–child closeness. All these associations were found for boys and in married families only. These findings suggest that improving mother and father engagement during childhood would be helpful to reduce adolescent boys’ problem behaviors as well as adolescent problem behaviors in married families.

Authors’ Contributions PY conceived of the study, designed and coordinated the study, drafted the manuscript. SP participated in its design and coordination and helped to draft the manuscript. GS participated in its design and drafted the manuscript. KE participated in the design and helped to draft the manuscript. All authors read and approved the final manuscript.

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Data Sharing Declaration Data used in this paper are publicly available in <https://ffcws.princeton.edu/>.

Compliance with ethical standards

Conflict of interest The authors declare no competing interests.

Ethical approval The original project grant was approved by the IRB at Princeton University. The current study was deemed exempt by Princeton University because the study uses deidentified secondary data. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants.

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Panpan Yang is a research specialist II at the Center for Research on Child and Family Wellbeing, Princeton University. Her research interests include child and adolescent problem behaviors, parenting, and quantitative methodology that can be used to developmental psychology.

Sarah L. Pachman is a director at the Center for Research on Child and Family Wellbeing, Princeton University. Her major research interests include poverty, housing, child and adolescent well-being, and social policies.

Gabriel L. Schlomer is an associate professor in Department of Educational and Counseling Psychology, University at Albany, SUNY. His major research interests include adolescent behavior problems, pubertal development, and genetic contributions to these behaviors.

Kathryn J. Edin is a William Church Osborn Professor of Sociology and Public Affairs, and director at the Center for Research on Child and Family Wellbeing, Princeton University. Her research interests include poverty, inequality, fatherhood, and social policies.