



Published in final edited form as:

*J Fam Psychol.* 2015 February ; 29(1): 39–48. doi:10.1037/fam0000043.

## Mediation and Moderation of Divorce Effects on Children's Behavior Problems

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### Abstract

Using data from the NICHD Study of Early Child Care and Youth Development, we examined children's internalizing and externalizing behavior problems from age 5 to age 15 in relation to whether they had experienced a parental divorce. Children from divorced families had more behavior problems compared with a propensity score-matched sample of children from intact families according to both teachers and mothers. They exhibited more internalizing and externalizing problems at the first assessment after the parents' separation and at the last available assessment (age 11 for teacher reports, or age 15 for mother reports). Divorce also predicted both short-term and long-term rank-order increases in behavior problems. Associations between divorce and child behavior problems were moderated by family income (assessed before the divorce) such that children from families with higher incomes prior to the separation had fewer internalizing problems than children from families with lower incomes prior to the separation. Higher levels of pre-divorce maternal sensitivity and child IQ also functioned as protective factors for children of divorce. Mediation analyses showed that children were more likely to exhibit behavior problems after the divorce if their post-divorce home environment was less supportive and stimulating, their mother was less sensitive and more depressed, and their household income was lower. We discuss avenues for intervention, particularly efforts to improve the quality of home environments in divorced families.

### Keywords

divorce; internalizing and externalizing behavior problems; longitudinal study

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In today's world, divorce is a normative event, affecting approximately half of all marriages in the U.S. (U.S. Census Bureau, 2004). Many of the children caught up in the experience of divorce exhibit difficulties in functioning, including frequent behavior problems and deficiencies in academic performance, even years following the event (Amato, 2001, 2010; Amato & Keith, 1991; Lansford et al., 2006; Wood, Repute, & Rosh, 2004). Parental divorce does not affect all children to the same extent, however. Some children ride out the dissolution of their family relatively unscathed, whereas others continue to show difficulties in behavioral and psychological adjustment (Amato, 1994, 2000, 2001; Hetherington, 1989, 1999; Kelly & Emery, 2003; Lansford, 2009). The developmental psychopathology framework (Davies & Cicchetti, 2004; Sroufe & Rutter, 1984) informs this investigation of

why some children function better than others following parental divorce. This framework focuses on studying processes over time in development, stresses the importance of individual trajectories of adjustment to adverse events (Cummings, Davies, & Campbell, 2000), and focuses attention on risk and protective factors that can affect these trajectories. Drawing on these concepts of risk and protection, we examined why some children function better than others following parental separation. We model longitudinal trajectories of behavior problems in a sample of children whose parents separated and a matched control sample of children in continuously married families and examine both mediators and moderators of the hypothesized association between parental divorce and behavior problems.

## Adaptation over Time

Understanding patterns of adaptation is an important aspect of the developmental psychopathology model (Cummings et al., 2000) and researchers have frequently used growth-curve modeling to investigate how children adapt to their parents' divorce over time in terms of absolute change, or change in mean levels over time. Lansford et al. (2006) examined trajectories of children's internalizing and externalizing behavior problems from 1 year prior to 3 years following parental separation, using a group matched on ethnicity, gender and socioeconomic (SES) status as a comparison. They found that separation/divorce was related to trajectories of increasing internalizing and externalizing problems, though there was some evidence of pre-divorce differences in externalizing problems. Using a similar multi-level modeling approach, Magnusen and Berger (2009) also observed that experiencing family status transitions, such as into a single-mother or step-father family, was associated with increases in behavior problems over time. Magnusen and Berger also found that individuals in divorced families differed from individuals in intact families in systematic ways leading to selection biases. Longitudinal associations between divorce and children's adjustment were also found in several other studies (Cherlin, Chase-Lansdale, & McRae, 1998; Ge, Natsuaki, & Conger, 2006; Strohschein, 2005). In sum, prior research shows that divorce is associated with changes in child behavior problems, though these findings are tempered by selection effects and preexisting differences between children in divorced families and children in intact families. The current study contributes to this literature by modeling absolute change in child behavior, while controlling for selection effects through propensity score-based matching, which is rare in studies of divorce (Frisco, Muller, & Frank, 2007).

In addition to modeling children's adjustment to divorce as a trajectory representing absolute change in behavior problems, an alternative is to model relative changes in their behavior over time, using children's own pre-divorce behavior as a control. This approach allows for an examination of whether children of divorce exhibit a change in their rank-ordering of behavior problems relative to other children. Although studies which control for predivorce characteristics of the child are comparatively rare, including pre-divorce measures of child behavior in analyses of divorce effects is particularly critical, given the evidence supporting a selection perspective on divorce effects (Amato, 2000; Clarke-Steward & Brentano, 2006). Essentially, this perspective argues that some children show difficulties in functioning prior to divorce, and therefore the purported effects of divorce might be eliminated if children's level of functioning prior to the divorce were taken into account (Videon, 2002; Allison &

Furstenberg, 1989; Hetherington, 1999). Indeed, many researchers who have adopted this approach report that controlling for pre-divorce differences reduces or eliminates divorce effects (Cherlin, Church-Lansdale & McRea, 1998; Størksen et al, 2005). If pre-divorce differences are not controlled for, even longitudinal data cannot effectively speak to the causal effect of divorce (Sun & Li, 2001). The present study contributes to this literature by modeling both trajectories of absolute change in children from divorced and intact families, as well as relative change, controlling for pre-divorce behavior.

## Moderating the Effects of Divorce: Risk and Protective Factors

According to Amato (2000, pg. 1272), “Protective factors act like shock absorbers and weaken the links between divorce-related events and people’s experience of stress, and hence the extent to which divorce is followed by negative emotional, behavioral, or health problems.” In selecting protective and risk factors, we drew from Garnezy’s (1985) tripartite model of protective factors, which includes (a) dispositional characteristics of the child, (b) family characteristics, and (c) extrafamilial contexts. We limited our focus to the first two areas, considering how their effects might buffer children from the effects of divorce. Within the domain of dispositional attributes we examined child intelligence as a potential moderating factor; within the domain of family characteristics we examined positive parenting as a protective factor and higher family income prior to the divorce as a potential buffer.

Child intelligence has often been identified as an important protective factor for children experiencing adversity (Rutter, 2006). For example, Hawaiian children in Werner’s (1993) study of resilience coped more effectively with extreme poverty when they had higher levels of intelligence. In a similar manner, more intelligent children may be better equipped cognitively to handle the challenges presented by a parental divorce. They may be better able to understand why their parents are separating and to reason about possible benefits of divorce for their parents and perhaps themselves. Although intelligence is frequently studied in research on child resilience, it is rarely considered as a protective factor for children of divorce. In one study, Katz and Gottman (1997) did find that children’s intelligence partially buffered them from the negative effects of marital conflict and dissolution in terms of peer relations and academic achievement. In the present study, we extend Katz and Gottman’s work by looking at the relation between child intelligence and post-divorce adjustment over a longer and later age period rather than the 3-year period from age 5 to age 8 they observed.

Positive parenting, including being sensitive and responsive to the child’s needs, is likely to protect children from the negative fallout associated with parental divorce because it increases the child’s sense of stability and security in the parent-child relationship and can strengthen the child’s coping abilities when faced with the challenges of parental separation (Amato, 2000; Hetherington, 1999; Kelly & Emery, 2003; Krishnakumar & Buehler, 2000). Wolchik and colleagues (2000) reported that maternal acceptance of the child moderated post-divorce stress and predicted fewer internalizing and externalizing problems in children aged 8–12. However, this study lacked a comparison group of intact families, and the researchers were not able to model longitudinal associations between parenting and child adjustment. These limitations are addressed in the current study.

Adults have more trouble adjusting to divorce if they have less income (Amato, 2000; Booth & Amato, 1991; Duffy, Thomas & Trayner, 2002). Extending this finding to children of divorce, one might expect that children from families with higher incomes prior to the divorce would be less affected by their parents' separation than children whose families had fewer monetary resources, because they would be less likely to experience stresses from poor housing, education, neighborhoods, and communities. The current study further contributes to this research area by testing for moderating effects of these three factors.

## Processes Linking Divorce and Children's Problem Behaviors

A focus on process is an important aspect of the developmental psychopathology approach, and for this reason we examine four post-separation processes, or mediators, through which divorce might lead to problems in children's adjustment: family income, mother's depressive symptoms, mother's sensitivity to the child, and the quality of the home environment. Family income is likely to decline after a divorce (Fields, 2003), and parents with limited resources generally experience greater stress and have less energy to devote to their children and the children are more likely to have mental health difficulties (Barrett & Turner, 2005). Parents are also likely to provide less sensitive care to their children following a divorce and may experience more depressive symptoms as well (Whiteside & Becker, 2000). In addition, the environment in the home of a divorced family may be less supportive of children's development (Poehlmann & Fiese, 1994), because parents are distracted and distressed and unable to provide the same level of cognitive and social stimulation. Each of these factors may offer a pathway through which divorce could result in adjustment difficulties in children following a divorce.

## The Current Study

In the current study we modeled children's trajectories of problem behaviors assessed by multiple informants from age 5 to age 15. We sought to model the effects of a variety of protective factors to identify dispositional or family characteristics that characterize children who fare better or worse following divorce. Lastly, we examined the processes that link parental divorce with problem outcomes. This study is particularly unique in the literature on divorce for several important reasons. First, unlike many studies of divorce effects (e.g. Cherlin et al., 1991; Morrison & Cherlin 1995; Robbers et al., 2011) we took a quasi-experimental approach to our analyses, using propensity score matching to attain a sample of divorced and intact families. Secondly, we analyzed the effects of divorce from multiple perspectives to gain a comprehensive understanding of the potential effects on children's adjustment: we modeled trajectories of internalizing and externalizing behavior problems to determine if divorce related to the intercept or slope of problem behaviors; we modeled rank order changes in problem behaviors by taking into account children's pre-divorce level of problem behaviors; and divorced and intact families were compared at the assessment immediately before the divorce and again at the assessment immediately following the divorce to examine the short-term effect of divorce, to complement the long-term effect of divorce addressed by the first two approaches. Lastly, longitudinal assessments of family characteristics make our findings particularly informative, as we were able to test for both moderation (using pre-divorce assessments) and mediation (using post-divorce assessments)

To our knowledge, nowhere in the literature have such comprehensive analyses been undertaken in a single study.

The following specific hypotheses were tested:

1. We anticipated that, on average, children from divorced families would have more internalizing and externalizing behavior problems than children from intact families (Ge, Natsuaki, & Conger, 2006; Lansford et al., 2006; Strohschein, 2005). We hypothesized that this difference would be evident in a higher mean number of behavior problems and a sharper increase in problems following parental separation, even after accounting for the child's pre-divorce behavior problems.
2. Divorce effects will be moderated by several protective factors related to child and family characteristics. We anticipated that more intelligent children and children with sensitive mothers would be buffered from the negative consequences of divorce. Finally, we anticipated that children from more affluent families prior to the divorce would be less affected by their parents' separation because they had experienced less stress and strain in their pre-divorce family.
3. Divorce effects will be mediated by family and parental characteristics including post-divorce custodial parent income, post-divorce maternal sensitivity and depressive symptoms, and the quality of the post-divorce home environment.

## Method

### Participants

Participants were the families in the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development. These families were recruited in 1991, shortly after their child's birth, from hospitals at 10 sites across the United States (Little Rock, AR; Irvine, CA; Lawrence, KS; Boston, MA; Philadelphia, PA; Pittsburgh, PA; Charlottesville, VA; Morganton, NC; Seattle, WA; and Madison, WI). Specific recruitment procedures are detailed more thoroughly by the NICHD Early Child Care Research Network (ECCRN) (2005). When infants were 1 month old, 1,364 mothers completed a home interview and became part of the initial study sample. This sample included a substantial proportion of low education parents (30% had no more than a high school degree), ethnic minority families (13% were African American compared with the national proportion of 12%), and the mean income level was the same as the U.S. average (\$37,000).

### Procedures and Variables

Detailed measures of family demographics, maternal behaviors, and children's characteristics and adjustment were obtained from multiple informants beginning when children were 1 month of age and continuing until they were 15 years old. Assessments were

conducted when children were 1, 3, 9, 12, 15, 24, 36, 42, 46, 50, and 54 months old, in Kindergarten and grades 1, 2, 3, 4, 5, 6, and 7, and at ages 14 and 15 years.

**Marital status variables**—Children’s experience of a parents’ divorce was determined from information collected from mothers at multiple time points. Mothers reported on their current marital arrangements when children were 1, 3, 9, 12, 15, 24, 36, 42, 46, 50, and 54 months old, in Kindergarten ( $M = 5.10$  years) and grades 1 ( $M = 6.45$  years), 2 ( $M = 7.39$  years), 3 ( $M = 8.42$  years), 4 ( $M = 9.32$  years), 5 ( $M = 10.6$  years), 6 ( $M = 11.36$  years), and 7 ( $M = 12.5$  years), and at ages 14 and 15 years. Of the original sample of 1364 children, 355 families were lost to attrition before the children were 15 years old resulting in a 73.4% retention rate in the study ( $N = 1009$  at age 15). Families who remained in the study until age 15 did not differ significantly in minority status from families who failed to continue, but they were more likely to be considered above the poverty line according to their income-to-needs ratio,  $\chi^2(1, N = 1273) = 27.25, p < .001$ ; to have an older mother,  $r(1362) = .14, p < .001$ ; and to have a mother with more years of education,  $r(1361) = .14, p < .001$ .

For analyses, the entire sample was examined for reports of divorce. Of the original sample ( $N = 1364$ ), 770 mothers (56.5% of the original sample) reported being continuously married at available time points and 260 (19.1%) mothers began the study married at 1 month and subsequently reported a separation or divorce. The remaining 334 families who began the study at one month were excluded either because they reported cohabitating with a partner ( $N = 153, 11.2\%$ ); were widowed or single parents at the first assessment ( $N = 150, 11\%$ ), reported an ambiguous change from married to partnered/living together ( $N = 18, 1.3\%$ ) began the study separated ( $N = 11, 0.8\%$ ), or had extensive missing data on the marital status variable ( $N = 2, 0.1\%$ ).

These 260 families comprised the divorced sample for all analyses; the distribution of children’s ages at the time of separation is presented in Table 1.

**Propensity to divorce and selection of a matched control group**—To reduce selection effects relating to divorce, we created a score reflecting a couple’s propensity to divorce by combining covariates of divorce into a composite score (Rosenbaum & Rubin, 1983). Six variables that previous research had shown to co-vary with divorce were analyzed for inclusion: mother’s age, father’s ethnicity, couple’s socioeconomic status, couple’s marital conflict, mother’s depression, and mother’s parenting stress. Socioeconomic status (SES) was defined as the average of five standardized indicators collected at the first assessment: mother’s education, father’s education, father’s employment status, mother’s employment status, and family’s income-to-needs ratio. When divorce status was regressed onto these six variables using logistic regression, all six showed unique predictive effects:  $\text{Exp}(b) = .937, p < .001$  for mother’s age,  $\text{Exp}(b) = 2.26, p < .001$  for father’s ethnicity,  $\text{Exp}(b) = .668, p = .003$  for couple’s socioeconomic status,  $\text{Exp}(b) = 1.38, p < .001$  for couple’s marital conflict,  $\text{Exp}(b) = 1.02, p = .040$  for mother’s depression, and  $\text{Exp}(b) = 1.02, p = .029$  for mother’s parenting stress. Therefore, the propensity score was created by saving the predicted probability of divorce based on the logistic regression of divorce status onto these six predictors. A high score represented a high probability of divorce (young age of mother, low SES, African American father, high marital conflict, high maternal depression, and high

maternal parenting stress); propensity scores ranged from .07 to .78;  $M = .30$ ,  $SD = .13$ . We then selected a sample of 260 intact married families (from the total sample of 770) matched to the separated/divorced sample by propensity scores. Each of the 260 separated/divorced families was manually matched to the intact family that was their nearest neighbor on the propensity variable, with matching beginning at the families who had the highest propensity to divorce (without replacement). Of these matches, 95% were within .10 on the propensity score. The maximum distance between matched families required to match the final 5% of the sample was .15.

**Child outcomes—*Internalizing and externalizing behavior problems:*** Mothers completed age-appropriate versions of the Child Behavior Checklist (CBCL; Achenbach 1991, 1992) when children were 24 months, 36 months, 54 months, in Kindergarten, in grades 1, 3, 4, 5, and 6, and age 15. Teachers completed the Teacher Report Form of the Child Behavior Checklist (TRF; Achenbach, 1991) each year beginning when children were in Kindergarten through grade 6. These instruments are recognized as highly reliable and valid measures of children's behavior problems (Achenbach, 1991; 1992).

**Moderator variables—*Pre-divorce family income to needs:*** family's income-to-needs ratio from each assessment point, averaged across the pre-divorce assessments ( $M = 3.79$ ;  $SD = 2.63$ , average correlation across assessments was  $r = .85$ ). Averaging across all available pre-divorce assessments produces an estimate that is not only representative of a longer period of time (and therefore a more accurate representation of persistent economic stress) but is also much more reliable.

*Pre-divorce maternal sensitivity:* Observations of mothers' sensitivity when interacting with their children were obtained eight times between age 6 months and grade 6. Videotapes of mother-child interactions involving play scenarios and problem-solving tasks were made at each of the study's 10 sites and sent to a single site for central coding, with coders blind to other information about the families. Rating scales were designed to capture the mother's emotional and instrumental support for the child's engagement with the task activities as well as collaborative interactions between mother and child. Individual ratings were combined at each age to represent maternal sensitivity in the interaction tasks. In order to maintain an age-appropriate measure of the construct, maternal sensitivity indicators changed somewhat over time, to reflect a developmentally appropriate measure of the same construct at each time point. Inter-coder reliability was established by having two coders assess approximately 20% of the tapes, randomly drawn from each assessment period. Additional details regarding coding procedures, training and reliabilities is available in NICHD ECCRN (1999, 2003 and 2006). For assessments at 6, 15, 24, and 36 months, sensitivity scores reflected the sum of three 4-point ratings: sensitivity to the child's non-distress signals, positive regard, and intrusiveness (reversed); these scores were recoded (by multiplying each by  $\frac{7}{4}$ ) to 7-point scales to make them comparable to observational scales obtained at later time points. The sensitivity score at 54 months and in grades 1, 3 and 5 was computed as the sum of three 7-point ratings: supportive presence, respect for autonomy, and hostility (reversed). For tests of moderation, mothers' average sensitivity from all pre-divorce assessments were used ( $M = 16.75$ ;  $SD = 2.03$ , average correlation across

assessments was  $r = .46$ ). Averaging across all available pre-divorce assessments produces an estimate that is a more accurate representation of persistent maternal sensitivity) and is more reliable ( $\alpha = .79$ ).

*Child's IQ:* Wechsler Abbreviated Scale of Intelligence scores when the child was in grade 4; observed values ranged from 71 to 145 ( $M = 107.44$ ;  $SD = 13.84$ ).

**Mediator variables—*Post-divorce home environment:*** The HOME Inventory (Caldwell & Bradley, 1984) was used to measure the quality and quantity of stimulation and support available to children at home. Information for the HOME Inventory was gathered when children were 54 months old and in grades 1 and 3. At 54 months, the HOME Inventory for Early Childhood was administered. In grades 1 and 3, the Middle Childhood HOME Inventory was completed. For each assessment, a HOME total score was computed, with higher scores denoting greater stimulation and support. To test whether this variable was a mediator of divorce effects, we used an average from all post-divorce assessments ( $M = 41.29$ ;  $SD = 5.11$ , average correlation across assessments was  $r = .64$ ), ( $\alpha = .84$ ).

*Post-divorce maternal depression:* Mothers' depression was assessed using the CES-D scale (Radloff, 1977) when children were 6, 15, 24, 36, and 54 months old, in grades 1, 3, 5, and 6, and at age 15. To examine whether mothers' depression mediated associations between divorce and children's behavior problems, we used an average from all post-divorce assessments of depressive symptoms ( $M = 9.48$ ;  $SD = 6.88$ , average correlation across assessments was  $r = .55$ ). Averaging across all available post-divorce assessments produces an estimate that is more representative of the average home environment, and is more reliable.

*Post-divorce maternal sensitivity:* To examine whether maternal sensitivity mediated associations between divorce and children's adjustment, we used mothers' summed sensitivity scores from all post-divorce assessments ( $M = 16.71$ ;  $SD = 2.01$ , average correlation across assessments was  $r = .48$ ).

*Post-divorce family income to needs ratio:* The family's income-to-needs ratio was computed as the ratio between total family income and the poverty threshold for each year the data were collected. The household income of the custodial parent was computed and averaged across post-divorce assessments to create the post-divorce income variable ( $M = 3.81$ ;  $SD = 2.84$ , average correlation across assessments was  $r = .82$ ).

**Data analytic strategy—**We used Mplus Version 6 (Muthén & Muthén, 2006) to estimate models using full-information maximum likelihood estimation (missingness was less than 11% for every cell of the covariance matrix). Analyses focused on both absolute change as well as relative change. Absolute change refers to changes in mean level over time, whereas relative change refers to shifts in rank order (Caspi & Bem, 1990). It is possible for one of these types of change to be present without the other. Therefore, to establish whether divorce is associated with either absolute change or relative change, we assess both separately. We also wanted to address whether divorce was associated with either short-term effects, or



long-term change. Consequently, three approaches were followed to assess the effect of parental divorce on children's adjustment.

First, models identifying latent intercepts and linear and quadratic slopes were fit to each of the four child outcomes (standardized into T-scores) to model *absolute* change in children's behavior problems from kindergarten through sixth grade (teacher report) and eighth grade (mother report). For example, the intercept of teacher externalizing was a latent factor with loadings of 1 onto each assessment (kindergarten – grade 6). The linear slope of teacher externalizing was a latent factor with loadings of –6 onto the kindergarten assessment, –5 onto the assessment at first grade, –4 onto the assessment at second grade, and so on. The quadratic slope of teacher externalizing was a latent factor with loadings of 36 onto the kindergarten assessment, 25 onto the assessment at first grade, 16 onto the assessment at second grade, and so on. Growth models were centered at the last available timepoint (grade 6 for teacher reports, age 15 for mother reports), allowing us to examine their adjustment in adolescence. This specification meant that the event of parental divorce temporally preceded the intercept, and occurred at some point either before or during the measured slope. This also means that differences in the intercept associated with divorce represent a conservative test, as the intercept is as temporally distant from the event of parental divorce as the data allow.

Second, rank-order change in children's behavior problems was modeled by regressing mother-reported internalizing and externalizing problems from the most distal post-divorce assessment (age 15) onto mother-reported problems from the assessment immediately preceding the divorce (within 24 months of divorce for 98% of families). We also pulled one family at random from the propensity-matched never-divorced pool and used their data from the same timepoint as the family who experienced divorce. This allowed us to create an age-matched control group. Because teacher-reported outcomes were available only from kindergarten through sixth grade, these analyses of relative change were conducted only for mother-reported problems.

Third, divorced and intact families were compared at the assessment immediately before the divorce and again at the assessment immediately following the divorce (within 12 months of divorce for 98% of families) to examine the immediate short-term effect of divorce, rather than the long-term effect addressed by the first two approaches.

Moderators were tested by entering the variable representing divorce, the hypothesized moderator (centered), and the product of the moderator and divorce. Mediation of divorce was assessed by entering each hypothesized mediator into a regression analysis that allowed the estimation of the indirect path from divorce status to child outcomes via the mediator.

## Results

### Descriptive Analyses

**Associations between Divorce and Child Problems**—The first set of analyses tested associations between divorce and the intercept and slope for each child outcome. Divorce status was related to the intercept for all four outcomes but was not related to the slopes.

Children from divorced families had more internalizing problems at grade 6 reported by teachers,  $b = 2.23$ ,  $p = .008$ , more internalizing problems at age 15 reported by mothers,  $b = 1.70$ ,  $p = .014$ , more externalizing problems at grade 6 reported by teachers,  $b = 3.56$ ,  $p < .001$ , and more externalizing problems at age 15 reported by mothers,  $b = 2.59$ ,  $p < .001$ . Specifically, at the last available assessment, teachers and mothers rated the behavior problems of children from divorced families approximately one-fifth of a standard deviation higher than the problems of children from intact families. Model fits were all acceptable, with RMSEA values ranging from .034 to .043 and TLI values ranging from .934 to .986.

The second set of analyses tested the effect of divorce in a framework that modeled relative, or rank order change, rather than absolute change. Rank-order stability refers to the consistency of the relative ordering of individuals over time and provides an indicator of the extent to which participants maintain their relative position in a group over time (Caspi & Bem, 1990). Mother-reported internalizing at age 15 was regressed onto divorce status and pre-divorce mother-reported internalizing, and mother-reported externalizing at age 15 was regressed onto divorce status and pre-divorce mother-reported externalizing. The fit of this model was acceptable,  $\chi^2 = 9.65$ ,  $df = 5$ ,  $TLI = .98$ ,  $RMSEA = .043$ . Divorce predicted rank-order increases in internalizing,  $\beta = .10$ ,  $SE = .04$ ,  $p = .011$  and externalizing,  $\beta = .10$ ,  $SE = .04$ ,  $p = .011$ .

Third, comparison of children from a matched sample of intact and separated/divorced families at the assessment immediately before the parents' separation showed no significant differences in mother-reported internalizing problems, mother-reported externalizing problems, teacher-reported externalizing problems, or teacher-reported internalizing problems. However, comparison of intact and separated/divorced families at the first assessment following the parents' separation showed significant increases in mother-reported internalizing problems,  $\beta = .09$ ,  $p = .036$ , mother-reported externalizing problems,  $\beta = .12$ ,  $p = .013$ , teacher-reported externalizing problems,  $\beta = .16$ ,  $p < .001$ , and teacher-reported internalizing problems,  $\beta = .14$ ,  $p = .001$ .

### **Moderators of Divorce Effects**

**Pre-divorce income to needs ratio:** Family income before the divorce moderated the effect of divorce on the intercept of teacher-reported child externalizing problems,  $\chi^2 = 72.11$ ,  $df = 38$ ,  $TLI = .966$ ,  $RMSEA = .043$ ;  $b = -.58$ ,  $SE = .28$ . Among divorced families, children from families with higher incomes prior to the separation had less internalizing problems than children from families with lower incomes prior to the separation. Income was not a significant moderator of divorce effects on the other child outcomes or on child outcome slopes.

**Mother's pre-divorce sensitivity:** Mother's sensitivity toward the child moderated the effect of divorce on the intercept of teacher-reported externalizing problems,  $\chi^2 = 59.62$ ,  $df = 31$ ,  $TLI = .973$ ,  $RMSEA = .036$ ;  $b = -.80$ ,  $SE = .30$ . Moderation was also evident for the quadratic slope of mother-reported child internalizing problems,  $b = .005$ ,  $p = .001$ , mother-reported child externalizing problems,  $b = .003$ ,  $p = .022$ , and teacher-reported child internalizing problems,  $b = .009$ ,  $p = .031$ . In each instance, mother's sensitivity functioned

as a protective factor buffering the effect of divorce (i.e., there were fewer problems or problems decreased more rapidly). When graphed (Figures 1–2), results for mother-reported internalizing and externalizing reflected that maternal sensitivity was most protective during middle to late childhood..

**Child's intelligence:** The child's IQ moderated the effect of divorce on the intercept of teacher-reported child internalizing problems,  $\chi^2 = 62.19$ ,  $df = 31$ ,  $TLI = .986$ ,  $RMSEA = .043$ ;  $b = 1.23$ ,  $SE = .60$ , and the linear slope of teacher-reported child externalizing problems,  $\chi^2 = 51.79$ ,  $df = 31$ ,  $TLI = .975$ ,  $RMSEA = .049$ ;  $b = -.16$ ,  $SE = .08$ . Moderation was also evident for the quadratic slope of mother-reported child internalizing problems,  $b = .006$ ,  $p = .016$ , and mother-reported child externalizing problems,  $b = .005$ ,  $p = .018$ . In each instance, IQ functioned as a protective factor; that is, the association between divorce and high levels of behavior problems was weaker for more intelligent children (Figures 3–4).

### Mediators of Divorce Effects

**Associations between mediators and child problems:** In a preliminary analysis to confirm that divorce predicted the selected mediator variables, we computed associations between divorce status and the 4 mediators. Divorce was associated with *home environment* =  $[r] -.42$ , *maternal depression* =  $.25$ , *maternal sensitivity* =  $-.34$ , and *family income-to-needs* =  $.26$  (all assessed post-divorce, all significant at  $p < .01$ ). We then tested for mediation by examining the significance of indirect paths (employing bootstrapped confidence intervals; MacKinnon, 2008). Fit for these mediation models was good, with  $RMSEA$  values ranging from  $.023$  to  $.053$ , and  $TLI$  values ranging from  $.983$  to  $.937$ . Results for mediation analyses are presented in Table 2. For example, teacher reported internalizing was partially mediated by post-divorce family income, maternal depression, and maternal sensitivity. Home environment fully mediated the association between parental divorce and teacher-reported internalizing problems, as evidenced by the nonsignificant main effect of parental divorce when home environment was included in the model. When all these mediators were tested simultaneously, only the post-divorce home environment remained significant. Across the four child outcomes, family income mediated once, maternal depression and home environment mediated three times, whereas maternal sensitivity mediated four times.

## Discussion

In this study we analyzed children's longitudinal adjustment to their parents' divorce in terms of internalizing and externalizing behavior problems rated by teachers and mothers, modeled processes by which divorce leads to increases in behavior problems, and identified protective factors that moderate the effects of divorce on children's adjustment.

As predicted, children from divorced families had significantly more behavior problems than peers from intact families, and these problems were evident immediately after the separation and later on, in early and middle adolescence. This is an important finding, because many studies and reviews of divorce have concluded that children return to typical functioning after the first two years following the divorce (Amato, 1994, 2001; Hetherington, 1999; Kelly & Emery, 2003). Our results suggest that divorce effects can be quite persistent, consistent with findings from two other longitudinal studies of children's adjustment

trajectories (Cherlin et al., 1998, VanderValk, Spruijt, de Goede, Maas, & Meeus, 2005). Associations were small in size, but were in line with results of meta-analyses reported in the literature (Amato, 2001; Amato & Keith, 1991). Effects were evident both at home as reported by mothers and at school as reported by teachers, suggesting that the observed differences were not the result of setting or informant bias.

Divorce did not lead to a faster increase in behavior problems. However, children from divorced families did increase in their rank order of behavior problems in a relative change model that took into account behavior problems immediately prior to the divorce. This finding indicates that, relative to the rest of the sample, children from divorced families increased in their ranking of behavior problems. Thus, for example, a child from a divorced family may go from a relative rank of 7 in the sample to a ranking of 5 post-divorce. It is rare in studies of divorce for researchers to control for children's pre-divorce problems, and this is an important contribution made by the current study.

Analysis of moderators of divorce effects revealed that children were more likely to exhibit externalizing behavior problems after their parents' separation if they came from families that had fewer financial resources before the separation. Thus, having greater family income prior to the divorce appeared to buffer children from the negative consequences of divorce. For children with lower incomes, the experience of stress due to family financial woes, lack of educational and community resources, and perhaps neighborhood crime exacerbated children's difficulty adjusting to the divorce. Few researchers have analyzed pre-divorce family income as a specific risk factor for children, instead focusing on the loss of resources post-divorce (Gadalla, 2009; Fischer, 2007). This is another contribution made by the present study, and it suggests that child advocates should make children from low-income families a particular focus for intervention aimed at helping children adjust to divorce.

We also found that mother's pre-divorce sensitivity buffered the overall effect of divorce on children's externalizing problems reported by teachers. It also decreased children's divorce-related internalizing problems reported by teachers and internalizing and externalizing problems reported by mothers. These findings extend the results of previous research and the current study showing that good parenting *after* divorce has positive effects for children by suggesting that mothers' good parenting *before* the divorce also predicts better and more rapid adjustment for children.

Another protective factor was children's intelligence. If children had higher IQ scores, this buffered the effect of divorce on internalizing problems reported by teachers and the rate of decrease in teacher-reported externalizing behaviors. Previous research has indicated that child intelligence buffers children from negative effects of divorce (Guidubaldi & Duckworth, 2001; Hetherington, 1989; Katz & Gottman, 1997; Kraynak, 1997; Wallerstein & Kelly, 1980), although the present study suggests that intelligence, and maternal sensitivity as well, may not be sufficient to fully inoculate children from problems associated with divorce, as children at age 15 still evinced behavior difficulties.

Analysis of mediators of divorce effects revealed that children were more likely to exhibit behavior problems after the divorce because their post-divorce home environment was less

supportive and stimulating, their mother was less sensitive and more depressed, and their household income was lower. Other studies have also shown that good parenting after divorce has positive effects for children (Amato, 2000; Lengua, Wolchik, Sandler, & West, 2000; Ruschena, Prior, Sanson, & Smart, 2005; Wolchik, Wilcox, Tein, & Sandler, 2000). In the present study, the quality of the home environment was a particularly strong, consistent, and independent mediator of internalizing problems, suggesting that after parents separate their children are likely to become anxious, withdrawn, and depressed because their daily living becomes more chaotic, their daily routines fall by the wayside, and their parents provide less emotional support and fewer avenues for cognitive and social stimulation (Hetherington & Kelly, 2002; Poehlmann & Fiese, 1994). This finding indicates that divorce itself may not be as detrimental for children as the circumstances that accompany it and suggests a possible avenue for intervention—helping divorced parents provide a supportive and stimulating home environment. This kind of intervention is more feasible than increasing maternal sensitivity, decreasing maternal depression, or increasing post-divorce household income.

The findings from this study hint that although individual and family characteristics may indeed be protective earlier in a child's life, the effects of divorce may still remain years following the event. Overall, the picture that emerges from this research is one of complex associations between divorce, pre- and post-divorce family and home characteristics, and children's behavior problems over time. In general, the quality of the home environment following divorce offers a positive and concrete avenue for intervention efforts. Additionally, the associations between divorce and problem behaviors may be less severe for more intelligent children and children of more sensitive mothers, but such children would also likely benefit from therapeutic programs.

### **Strengths, Limitations, and Future Directions**

The present investigation had a number of strengths. It was based on a large sample of families drawn from ten locations across the United States and included a substantial proportion of low education parents and ethnic minority families. Importantly, the sample was not selected on the basis of divorce status. Rather, the families were followed over time from infancy through adolescence and data were collected both prior to and following a naturally occurring family transition. Assessments were made at multiple time points by multiple informants. Analyses were strengthened by the use of multi-level modeling techniques and a quasi-experimental approach that allowed each child to act as his/her own control. Using a matched sample of intact families for comparison purposes and controlling for parents' propensity to divorce reduced potential selection effects.

However, the study had limitations. Because children could not be randomly assigned to divorcing parents, findings are necessarily correlational. It is possible that other, unexplored variables could account for observed associations. Furthermore, due to the longitudinal nature of the study, attrition was an issue in the study and the sample that completed the study was not identical in risk factors to those who began the study. This may have implications for the longitudinal interpretation of our findings. A particularly important limitation was our lack of information about fathers' behavior following parental separation.

These children all remained with their mothers following separation, and data were not collected from non-resident fathers. Furthermore, this study was limited by a lack of information on contextual details, such as the family structure following divorce and the details of custody and living arrangements. Additionally, although at recruitment the sample was not queried regarding sexual orientation, it is assumed that the sample represents heterosexual couples, thus limiting our ability to generalize to children experiencing separations in same-sex couples. Continued study of individual differences in children's adjustment to parental separation is clearly necessary if we are to fully understand the processes of adjustment to divorce and provide support for children who experience it.

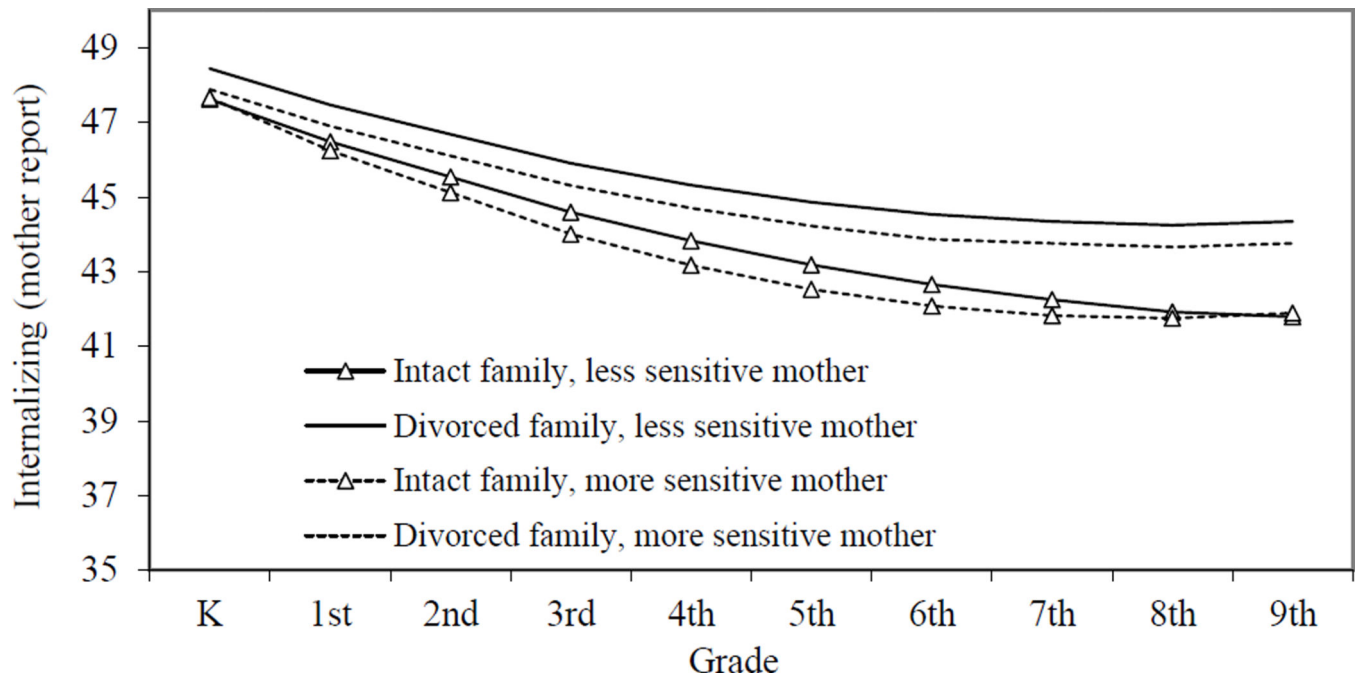
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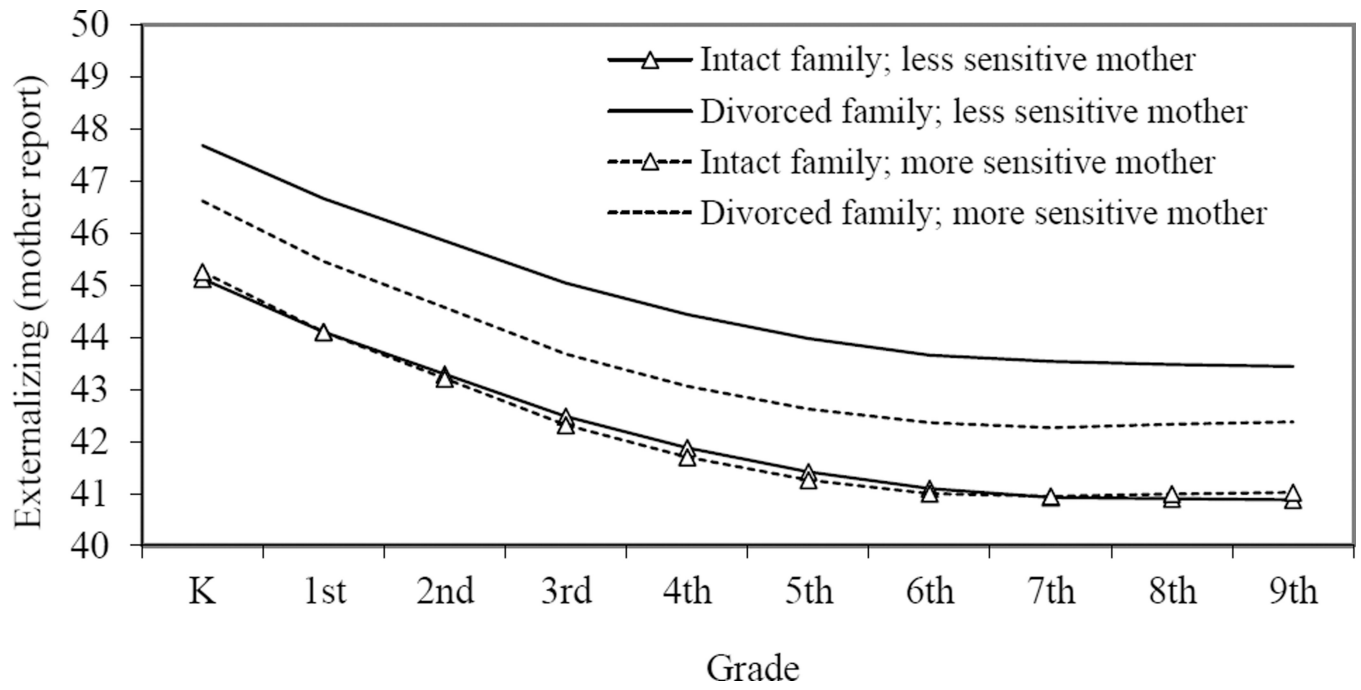
**Figure 1.**  
Moderation of maternal sensitivity on mother-reported internalizing

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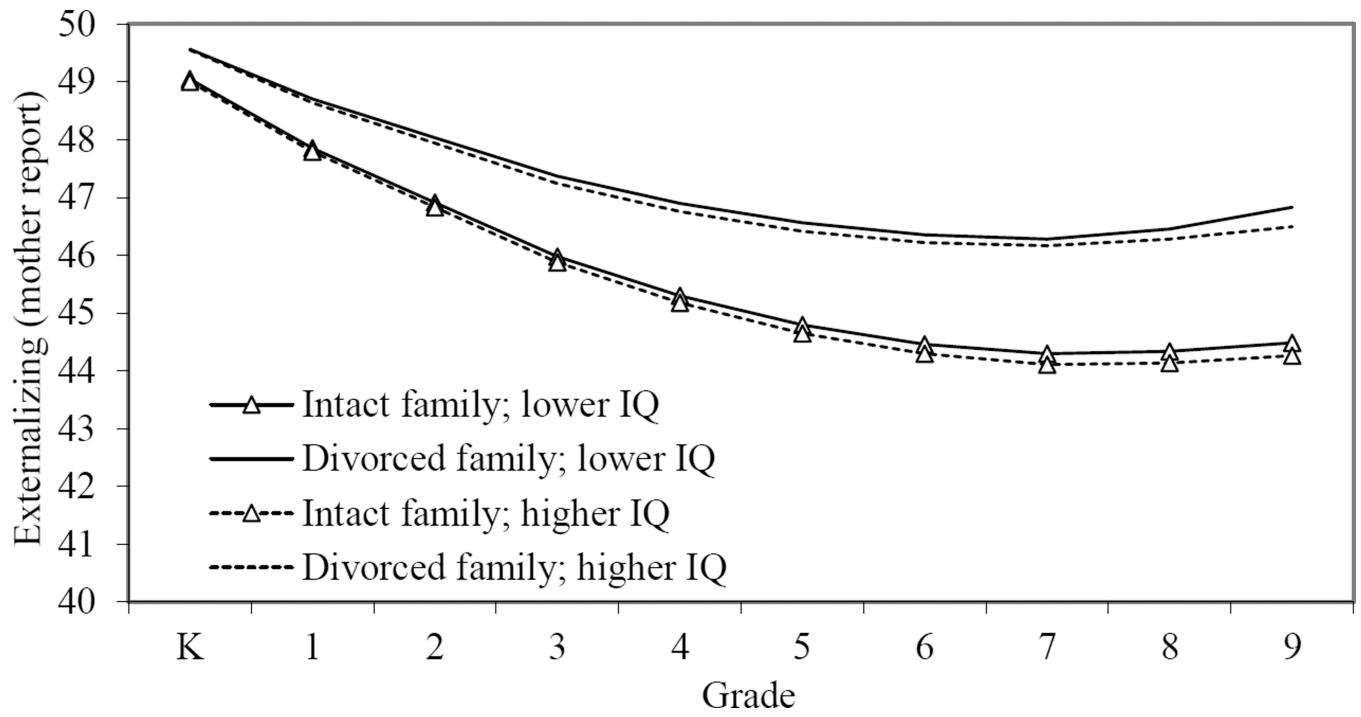
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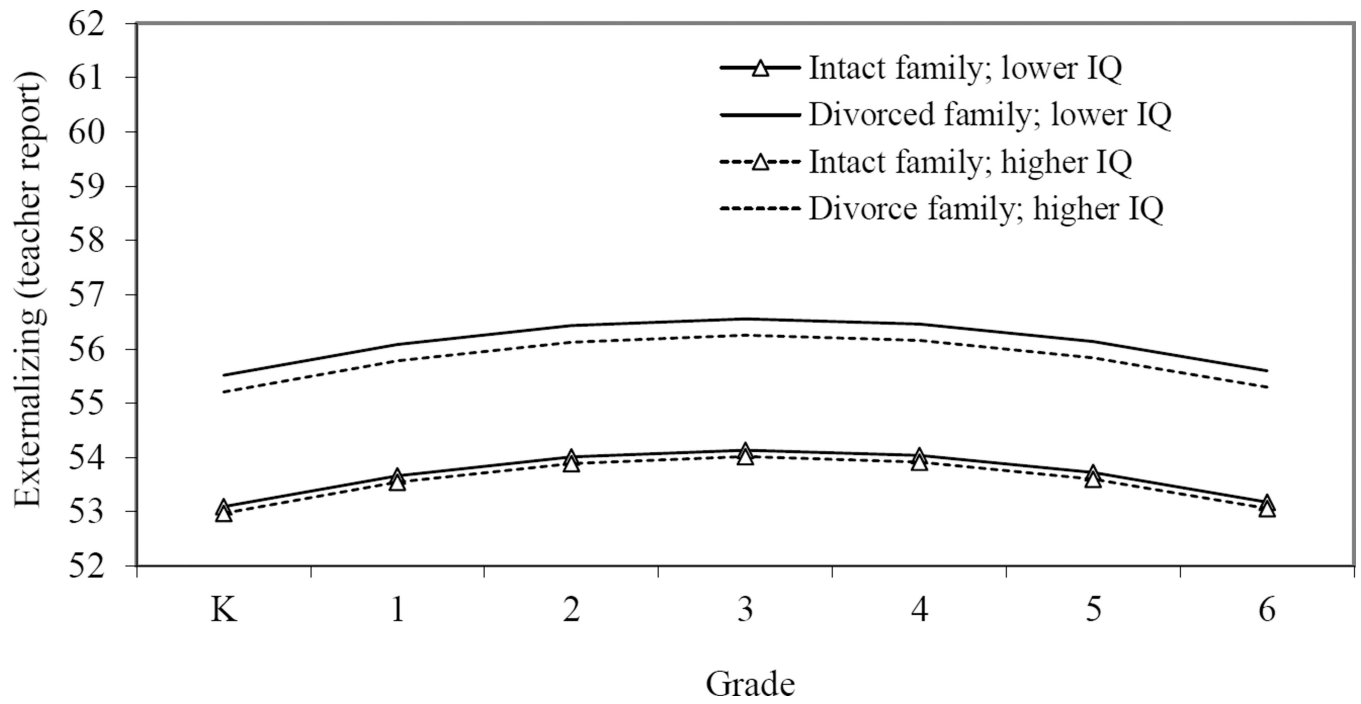
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**Figure 2.**  
Moderation of maternal sensitivity on mother-reported externalizing



**Figure 3.**  
Moderation of child IQ on mother-reported externalizing



**Figure 4.**  
Moderation of child IQ on teacher-reported externalizing



Unstandardized Effect Sizes From Models Testing For Mediation of Parental Divorce

Table 2

Model	Internalizing <sup>T</sup>		Externalizing <sup>T</sup>		Internalizing <sup>M</sup>		Externalizing <sup>M</sup>	
	Direct Path	Indirect Path	Direct Path	Indirect Path	Direct Path	Indirect Path	Direct Path	Indirect Path
Unmediated model	0.22*	-	0.26*	-	1.70*	-	2.59*	-
Mediated by post-divorce family income	0.20*	0.02*	0.09	0.02	0.41	0.46	0.37	0.43
Mediated by post-divorce maternal depression	0.20*	0.02*	0.13	0.06	0.78	0.93 <sup>*A</sup>	1.88*	0.73 <sup>*A</sup>
Mediated by post-divorce maternal sensitivity	0.18*	0.04*	0.20*	0.06 <sup>*A</sup>	1.38*	0.43*	1.66*	0.96*
Mediated by post-divorce home environment	0.12	0.09 <sup>*A</sup>	0.16*	0.10 <sup>*A</sup>	1.28	0.42	1.11	1.46 <sup>*A</sup>

Note. T = teacher report, M = mother report.

<sup>A</sup> Indirect path remains significant in simultaneous multiple mediation model.

\*  $p < .05$ .