

Paternal Distress and Child Behavior Problems in Low-SES Families: Quality of Father-Child Interactions as Mediators

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Abstract

This study examines, in low-income families, whether fathers' distress is associated with behavioral problems in preschool children and if the quality of father-child interactions mediates this association. Participants were 81 children between the ages of 3 and 5 years and their parents who were receiving social welfare. Quality of father-child interactions was assessed during a free play situation and a toy cleanup task, fathers' parenting stress and psychological distress were self-reported, and children's behavior problems were assessed by both parents. Results showed that the quality of father-child interactions during free play, but not during cleanup, partially mediated the link between father distress and child internalizing and externalizing behavior problems. Our findings point to the role of the father-child relationship in the intergenerational transmission of risk in the preschool period.

Keywords: fathers; psychological distress; behavior problems; father-child interactions; low socioeconomic status.

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Children who grow up in contexts of low socioeconomic status (SES) experience greater developmental difficulties. Notably, they are at greater risk of displaying internalizing and externalizing behavior problems compared to children from average or more affluent families (Letourneau, Duffett-Leger, Levac, Watson, & Young-Morris, 2013). In addition to having a detrimental impact on children's development, financial difficulties are also likely to significantly affect parents' psychological health. Studies have shown that lower family income generates financial stress in both mothers and fathers, which consequently affects parenting and child behavior problems (Nepl, Senia, & Donnellan, 2016; Ponnet, Van Leeuwen, & Wouters, 2014). In particular, fathers who experience economic hardship are at risk of developing symptoms of psychological problems and parenting stress (Burbach, Fox, & Nicholson, 2004; Williams, Cheadle, & Goosby, 2015). The ecological-transactional model (Bronfenbrenner, 1977; Cicchetti & Lynch, 1993) provides a relevant conceptual framework for targeting key processes to be considered in a more integrated understanding of low-income children's adaptation. According to this model, the parent-child relationship has a greater impact on child adaptation than more distal variables, such as characteristics of the parents or the community.

To date, the association between child behavior problems, father distress and parenting behaviors remains understudied, particularly among low SES families. The preschool period is a sensitive developmental stage during which children experience substantial neurodevelopmental and socioemotional changes (Luby, 2017). Also salient during this period are the changes occurring to the parent-child relationship, gradually transforming into a goal-corrected partnership in which children learn to revise and express their plans, intentions, emotions according to those of their parent (Moss, Cyr, Bureau, Tarabulsy, & Dubois-Comtois, 2005).

Taken together, these elements highlight the need to better understand the father-child relationship and child behavior problems in low-income families during this sensitive developmental period. Thus, this study assesses the mediating role of father-child interactions in the association between fathers' distress and behavior problems in preschool-aged children of families at socioeconomic risk.

Low-Income and Child Behavior Problems

Economic hardship is associated with an array of precarious living conditions, including limited material resources, food insecurity, difficulty finding safe and affordable housing, and fewer opportunities for social and leisure activities. In addition, low-income families are more likely to be strained and affected by multiple risk factors, including low parental education and social isolation (Evans & Kim, 2010). As a result, the adverse effects of financial strain, and other cumulating risk factors, induce constant pressure on families who then struggle to maintain healthy family functioning and promote their children's development (Conger, Rueter, & Conger, 2000; Evans & Kim, 2013). Low income tends to cluster with other risk factors such as low education, ethnic minority, psychopathology, and their cumulative effect, both at the origin and a consequence of low income, becomes pervasive for families. Children living in these risk conditions are particularly vulnerable to developmental problems. Exposure to cumulative risk in early development has been associated with subsequent behavior problems, with those exposed to consistent high cumulative risk showing the highest prevalence of problems at 4.5 years (Wallander et al., 2019). A meta-analysis has shown that children from low SES have an increased risk of developing externalizing (e.g., opposition, hyperactivity and aggression) and internalizing behavior problems (e.g., anxiety, depression and withdrawal; Letourneau et al., 2013). The incidence of behavior problems reaching the clinical threshold in young children from

families living in poverty ranges from 17% to 52% in the literature (Fei, Walker, Severson, & Ball, 2000; Holtz, Fox, & Meurer, 2015), a percentage that is higher than what is found in the general population. Although some studies have documented the deleterious effects of poverty on child social and school adaptation, the parenting mechanisms involved in these associations, especially with regard to fathers, are not well known.

Father Distress and Child Behavior Problems

Studies interested in the association between fathers' and children's well-being have mainly focused on two aspects of father distress, that is, mental health problems and parenting stress. While mental health problems are related to the individual's psychological symptomatology, parenting stress is specifically linked to the burdens of the parental role (Abidin, 1995). Studies on the association between fathers' mental health symptoms (e.g., depression and externalizing problems) and children's behavior problems have found direct and indirect associations (Low & Stocker, 2005; Weijers, van Steensel, & Bögels, 2018). A study testing inherited and environmental factors associated with the intergenerational transmission of mental health problems showed that for depression, direct and mediated pathways were observed for genetically related father-child dyads, but no association was found between father and child depression for genetically unrelated father-child dyads (Harold, Rice, Hay, Boivin, Van Den Bree, & Thapar, 2011). For antisocial behaviors, the direct association between father and child behaviors was fully mediated by parent-to-child hostility in genetically related and unrelated dyads.

Father parenting stress is likely to be influenced by multiple family stressors, including having to take care of a difficult child, but, in turn, higher parenting stress is also likely to influence child adaptation (Patterson & Fisher, 2002). This idea of a bidirectional relation between parenting stress and child behavior problems has been supported for mothers as well as

fathers (Neece, Green, & Baker, 2012). In the preschool period, father parenting stress has been associated with behavior problems in children from both middle class and financially precarious families (Kettani, Troupel-Cremel, & Pinel-Jacquemin, 2011). In a study of clinically referred school-age children and adolescents, the association between father parenting stress and behavior problems was also significant (Weijers et al. 2019). However, in a study with low-income families, parenting stress in unmarried fathers was only marginally associated with child internalizing problems, while in married families the association was non-significant for either internalizing or externalizing problems (Lee, Pace, Lee, & Knauer, 2018). The direct association between father parenting stress and toddlers' adaptation was also non-significant in a study with low-income African American families, but an indirect effect was observed through father involvement (Cabrera & Mitchell, 2009). In a sample of low-income families, researchers tested whether father mental health and parenting stress concurrently and longitudinally predicted parent- and teacher-reports of child behavior problems (Vallotton, Harewood, Froyen, Brophy-Herb, & Ayoub, 2016). Both fathers' depressive symptoms and parenting stress were associated with their own ratings of child behavior problems when children were 3 years old. Greater father depressive symptoms in early childhood were associated with higher child hyperactivity and less self-control and cooperation behaviors in the school setting at 10 years of age. While fathers' parenting stress exerted a larger effect than depressive symptoms at age 3, it was unrelated to child behaviors at age 10.

Taken together, the results of these studies suggest a positive association between child behavior problems and father distress, whether it be from mental health problems or parenting stress, with more consistent associations found with father mental health problems. However, given that parenting stress and psychological symptoms in fathers are generally strongly related (Weijers et al. 2019) and that fathers who experience psychological symptoms and parenting

stress have been shown to interact similarly with their child (Goodman, 2008), treating both variables independently may not provide a clear view of fathers' distress and its association with child behavior problems.

Father-Child Interactions: A Transmission Mechanism?

According to the ecological-transactional model of development, contextual risk influences various levels of the family system and, in turn, child development (Bronfenbrenner, 1977; Cicchetti & Lynch, 1993). As such, distressed parents tend to exhibit more negative parenting behaviors, such as being less supportive, less consistent and less involved in their child's upbringing, and present fewer positive behaviors, as observed in less sensitive and more reactive behaviors (Hoff, Laursen, & Tardif, 2002; Magnuson & Duncan, 2002). Though the ecological-transactional model acknowledges the influence of different systemic levels, systems closest to the child, such as the parent-child relationship, are considered to have the greatest impact on child development and act as a transmission mechanism between parental distress and child adjustment. An increasing number of studies have tested this mediation path between father and child adaptation. For instance, studies have confirmed the mediating role of father-child conflict and hostility in the association between father and child psychopathology in middle childhood (Kane & Garber, 2009; Low & Stocker, 2005). This result was found after controlling for maternal depression in one of the studies (Kane & Garber, 2009).

Aside from engaging in positive, playful activities with their children, two other primary components of parenting behaviors have been identified as reflecting paternal engagement, namely, warmth-responsiveness, which refers to fathers' ability to respond with affection and sensitivity to their child, and control, which refers to limit-setting and disciplining the child (Barker, Iles, & Ramchandani, 2017). Warmth and control behaviors have been associated with child adaptation (Feldman & Klein, 2003; Flanders, Simard, Paquette, Parent, Vitaro, Pihl, &

Séguin, 2010; Newton, Laible, Carlo, Steele, & McGinley et al., 2014; Trautmann-Villalba, Gschwendt, Schmidt, & Laucht, 2006) but have not been tested as mediators in the link between father and child adaptation.

In a socioeconomically diverse sample, fathers' lack of warmth/sensitivity was related to fathers' depression symptoms and children's lower self-regulation and social competence at age 3 after controlling for maternal depression (Eiden, Colder, Edwards, & Leonard, 2009). However, the relation between fathers' warmth/sensitivity and social competence became non-significant once the direct association between fathers' depression and social competence was included in the model. Thus, this relation seems to be partially explained by fathers' depression symptoms. In a study on parents and children conceived through in vitro fertilization, although fathers' warm parenting was negatively related to their own symptoms of depression and antisocial behaviors, it was not associated with children's depression symptoms and antisocial behaviors (Harold et al., 2011).

In a sample of preschool children with clinical levels of externalizing problems, fathers' self-reported lax parenting (i.e., inconsistent discipline) was related to their own symptoms of psychopathology (Harvey, Stoessel, & Herbert, 2011). In another study with a sample of preschoolers with externalizing problems, child behavior problems were related to fathers' parenting stress but not to fathers' demandingness during father-child interactions (Calzada, Eyberg, Rich, & Querido, 2004). In the latter study, authors controlled for maternal depression and parenting stress, but none of these two studies tested the mediating role of parenting.

In sum, although warmth-sensitivity and control parenting behaviors are associated with child adaptation, more research is needed to assess their role as mediators between fathers' distress and child behavior problems, especially in low-income families for whom studies are lacking. Given the increasing influence of child behaviors in the parent-child relationship during

the preschool period (Marvin, Britner, & Russell, 2016), it is important to consider both the child and the father when assessing the quality of their relationship. Therefore, the present study examined if the quality of father-child interactions mediated the associations between paternal self-reported distress (psychological symptoms and parenting stress) and preschoolers' internalizing and externalizing problems (mothers' and fathers' reports) among socioeconomically disadvantaged families. The quality of father-child interactions was assessed in two different interaction contexts, a free play and a cleanup task that tap well into the warmth-sensitivity and control constructs. We hypothesized that both contexts of father-child interactions would mediate the association between father distress and child behavior problems. Finally, considering that the quality of father-child interactions has been related to maternal distress (Goodman, 2008), we also tested whether these mediation models still held after controlling for maternal distress.

Method

Participants

Participants were 81 two-parent families receiving social welfare and living in metropolitan urban and rural areas in the Province of Quebec, Canada. Children (47 % boys) were on average 48.36 months of age ($SD = 9.03$). The majority of the men in the study (98%) were the biological fathers of the children and they had an average age of 36.75 years ($SD = 6.32$). As for the fathers' education level, 1.2 % had no diploma, 58 % had a high school diploma, 28.4 % had a college or vocational diploma, and 12.3 % had a university diploma. The families had between one and seven children: 8.6% of the families had one child, 32.1% had two children, 35.8% had three, 9.9% had four, 9.9% had five, and 3.7% had six or seven. Of the families in the sample, 8.6 % had a family income under \$8,000, 38.3 % had an income between \$8,000 and \$14,999, 37 % had an income between \$15,000 and \$21,999, 12.3 % had an income between \$22,000 and \$28,999,

and 3.7 % earned between \$36,000 and \$42,000. When accounting for the number of children, each family is living under the poverty threshold.

Procedure

Nominative data pertaining to the families were obtained from the government's official lists of families receiving social security benefits. The project was approved by Université du Québec à Trois-Rivières' ethics committee. Only families for which the father or a stable father figure was living at the family home were solicited. In our sample, the paternal figures had been living with the child for more than a year. Families were contacted, and for those who wished to participate in the project, a visit took place at the family home with all family members.

Approximately 26% of the referred families agreed to participate. Those who did not participate were either unable to be reached (approx. 50%) or declined our invitation. After being contacted by phone and providing consent to participate in the study, families were met at their homes where various filmed tasks were conducted, including a father-child free play and toy cleanup task. During the visit, mothers and fathers completed questionnaires on their own well-being and both parents also completed a questionnaire on their child's behavior problems. Questionnaires that were not completed during the visit were sent by mail to the laboratory in the following week. Some families did not return their questionnaires and never responded when the research assistant tried to contact them.

Measures

Sociodemographic Characteristics of the Family. This questionnaire (Dumas & Wahler, 1983) was used to obtain sociodemographic information on the family, such as child sex and age at the time of the study, parents' education level, and family income.

Father Distress. Father distress was evaluated from two self-report measures, one assessing psychological and psychiatric symptoms and the other assessing parenting stress.

1) To assess the level of symptomatology, fathers completed the Brief Symptom Inventory (BSI; Derogatis, 1993). This 53-item questionnaire assesses the presence of psychological or psychiatric symptoms across various dimensions: somatization, depression, anxiety, hostility, paranoid ideations, and psychotic behaviors. The Global Severity Index (*T*-scores), which includes the total number of symptoms of psychological distress and the intensity of these symptoms, was used in the analyses. This index is the most sensitive indicator of the respondent's level of symptomatology (Derogatis, 1993). Using data of the current study, the Cronbach's alpha for the Global Severity Index was excellent ($\alpha = .96$).

2) To assess parenting stress, fathers completed the Parenting Stress Index – Short form (PSI-SF; Abidin, 1995). This self-reported 36-item questionnaire assesses the level of stress that the parent experiences as a result of the child's particular characteristics and challenges related to the role of parenting. The questionnaire provides a total score of parenting stress from three scales: parental distress, dysfunction of parent-child interactions and difficult child. Only the parental distress scale was used in the analyses, as this scale measures the distress experienced by fathers when engaging in their parental role (e.g., low feeling of parental competence, presence of depression) and does not include items that relate to child behaviors like in the other two scales. The Parenting Stress Index (PSI) is the most widely used measure of parental stress in research and it shows excellent psychometric properties (Abidin, 1995). Using data of this study, excellent internal consistency was found for the distress scale ($\alpha = .93$).

In our sample, the two measures of fathers' distress were strongly intercorrelated, $r = .63$, $p < .001$. Thus, the data from these two measures were converted into *z* scores and combined into a composite score of fathers' distress.

Mother Distress. Mother distress was assessed using the same two self-report measures used to test father distress. Internal consistency scores for the maternal Global Severity Index and

the PSI parental distress scale were excellent (α of .96 and .92, respectively). Intercorrelations between mothers' symptomatology and parenting stress was high, $r = .62, p < .001$, and both variables were converted into z scores and combined into a composite score of mothers' distress.

Child Behavior Problems. Fathers and mothers completed the Achenbach System of Empirically Based Assessment (ASEBA; Achenbach & Rescorla, 2000), a 113-item questionnaire using a Likert scale from 0 to 2 (*Not true* to *Very true or Often true*). It assesses both internalizing (emotional reactions, anxiety/depression, somatic complaints and withdrawal) and externalizing (attention problems and aggressive behaviors) problematic behaviors displayed by preschool children. The raw scores were converted into standardized scores (T -score). These standardized scores have a very good test-retest stability over periods of 3 to 6 months. This questionnaire shows excellent convergent and discriminant validity (Achenbach & Rescorla, 2000). Excellent internal consistency scores on data of the current study were found for internalizing and externalizing behaviors (α between .82 and .94). The intercorrelation between mothers' and fathers' scores was high (for externalizing problems: $r = .72, p < .001$; for internalizing problems: $r = .68, p < .001$); accordingly, a composite score was computed by averaging scores of both parents to reflect their perception of their child's externalizing and internalizing behavior problems.

Quality of father-child interactions. Quality of father-child interactions was assessed through the observation of filmed video sequences of the free play and toy cleanup task, which lasted 10 minutes overall. Each dyad was invited to play with toys that were provided by the research team (e.g., building blocks, balls, play dough) for eight minutes. The father was then invited to ask his child to put the toys away with the least amount of help possible, although he could help his child if he deemed it necessary. The toy cleanup sequence lasted two minutes. Independent observers coded filmed father-child interactions using one of two instruments.

1) Free play interactions were coded during the 8-minute free play task using the Parent-Child Interaction Scale for the Preschool and School-Age Periods (Moss et al., 2005). It is composed of a scale that represents the overall quality of interactions within the dyad and eight subscales reflecting different dimensions of parent-child interactions: 1) coordination; 2) communication; 3) roles; 4) emotional expression; 5) appropriate sensitivity/responsivity; 6) tension/relaxation; 7) mood; and 8) enjoyment. For the entire interaction sequence, a score between 1 and 7 is assigned to the scale as well as each subscale, with higher scores indicating greater engagement and warmth of both partners of the dyad during the interaction. For the overall scale, a score of 1 reflects highly intrusive, hostile or disengaged interactions, while a score of 7 is indicative of harmonious and reciprocal interactions. The instrument has been shown to distinguish parent-child dyads with different attachment classifications, has shown concurrent and longitudinal associations with behavior problem ratings and other measures of quality of mother-child interactions (e.g., Dubois-Comtois & Moss, 2004; Moss et al., 2005), and has been validated with father-child dyads (Bureau, Yurkowski, Schmiedel, Martin, Moss, & Pallanca, 2014). Because all scales were highly intercorrelated (r between .71 and .92), only the overall scale score was included in data analyses.

2) Fathers' control and child compliance during the 2-minute toy cleanup task were evaluated using Kochanska and Aksan's (1995) paradigm. This coding system is composed of four mutually exclusive categories (scores ranging from 1 to 4) for father control (no involvement; social exchanges; guidance/gentle control; negative control) and five mutually exclusive categories (scores ranging from 1 to 5) for child compliance (committed compliance; delayed compliance/not negative; delayed compliance/negative; passive noncompliance; defiance). To compute a score of fathers' control on a continuum ranging from problematic to optimal control, paternal disengagement and negative control (scores of 1 and 4) were combined.

Thus, fathers' control behaviors were coded using an ordinal scale ranging from 1 (negative control/disengagement) to 3 (adequate guidance and control). Correlations between father control and child compliance was moderate to high ($r = -.49, p = .001$). Both variables were converted into z scores (with child compliance scores reversed) and combined into a composite score representing father control/child compliant behaviors. Parent control and child compliance were also combined in Kochanska and Aksan's (1995) study.

The free play was coded by two trained independent coders, while two other independent observers coded the cleanup task. The four raters were blind to study measures. Twenty percent of the video sequences were coded for reliability purposes. Interrater agreements were excellent for the free play overall scale ($r_{icc} = .86, p < .01$) and moderate to substantial for the toy cleanup task (80% and 90% agreement, kappa of .56 and .76, for parent control and child compliance, respectively). Any disagreement was resolved through discussion between the raters' pairs.

Statistical Analyses

In order to test the mediating role of quality of father-child interactions in the association between father distress and child behavior problems, analyses were performed using structural equation modeling (SEM) to assess direct and indirect relationships among variables. The indirect effects were assessed using bootstrapping with 2,000 bootstrap samples and tests of indirect effects were performed using confidence intervals based on the bias-corrected bootstrap method. We used the full information maximum likelihood (FIML) estimation method to account for missing data. This method has shown to be very efficient when analyzing data from samples with moderate levels of missing values. When using FIML, the estimation of each parameter is done on the basis of all available information from each participant. Consequently, we can retain in the analysis participants with occasional missing data, so they contribute to model estimation. Analyses were conducted using Mplus (version 8.3) and adequacy of model fit was assessed

through several indices: a non-statistically significant chi-square value, a CFI value $\geq .95$, and a RMSEA value $\leq .06$ (Hu & Bentley, 1999). To ensure adequate statistical power to test mediation models with SEM, Kline (2011) recommends a minimum of 5 participants per estimated parameter in each model. Therefore, two models were tested to meet this standard, one for each mediation variable.

Analyses were performed in three steps. First, descriptive and correlation analyses were conducted on all study variables. Then the two mediation models were tested and only the covariables that were related to child behavior problems ($p < .25$ according to Hosmer, Lemeshow, & Sturdivant, 2013) were included in the models. Finally, analyses were rerun with maternal distress included as a predictor.

Results

Descriptive statistics

The descriptive statistics of study variables are presented in Table 1 and the correlation matrix between study variables and sociodemographic characteristics is shown in Table 2. Results showed that the associations between the number of children in the family and child internalizing problems ($r = -.18, p = .16$) and between father education and child externalizing problems ($r = -.17, p = .17$) were strong enough (according to Hosmer et al., 2013) to be included as covariates in each of the mediation models (see figure 1). The proportion of data used to estimate each model ranged from 88% to 100%. An analysis of the entire data file using Little's test of *Missing Completely At Random* (MCAR) indicated that the missing data were missing in a completely random manner, $\chi^2(105) = 95.07, p = .75$. There were no group differences between families with missing versus complete data on any of the study variables.

Mediation Analyses: The Role of Father-Child Interactions

The first model tested the mediating effect of father-child interactions during free play in the relation between father distress and child behavior problems (see Table 3). Indices revealed an excellent fit for the model: $\chi^2(8) = 10.44, p = .236$, RMSEA = .06 (90% CI: .00 – .15), CFI = .98. The indirect effect of father distress on child behavior problems was significant for internalizing and externalizing problems (95% CI: 0.07 to 2.08 and 95% CI: 0.08 to 2.46, respectively) and a direct effect of father distress on child internalizing and externalizing problems continued to be significant ($b = 6.25; p = 0.00$ and $b = 5.97; p = 0.00$, respectively). The explained variance is 48.6% for internalizing problems and 40.9% for externalizing problems.

The second model evaluated the mediating effect of father-child interactions during the cleanup task in the relation between father distress and child behavior problems (see Table 3). Indices revealed an excellent fit for the model: $\chi^2(8) = 6.975, p = .589$, RMSEA = .00 (90% CI: .00 – .12), CFI = 1.00. No significant indirect effect was found. The association between father distress and father-child interactions was not significant. However, father-child interaction was negatively related to internalizing problems. As shown in the previous model, a direct effect of father distress on child internalizing and externalizing was significant ($b = 6.74; p = 0.00$ and $b = 6.58; p = 0.00$, respectively). The variance explained is 55.5% for internalizing problems and 40.7% for externalizing problems.

Although the power recommended by Kline was not respected (the number of parameters for models 1 and 2 was 24), we nonetheless repeated the previous series of analyses to test whether the addition of maternal distress as a covariate modified the obtained results. The results for these additional analyses were identical to the first series, with the exception of the direct relation between father distress and internalizing problems that became nonsignificant once the quality of father-child interaction during free play was included in the model ($b = 2.05, p = .08$).

Discussion

The purpose of the present study was to evaluate whether fathers' level of symptomatology and parenting stress were related to internalizing and externalizing behavior problems in preschool-aged children of low-income families, and whether quality of father-child interactions mediated this relation. In accordance with the ecological-transactional model, our results highlight the predictive value of proximal variables in showing that father-child interactive quality in everyday-like play contexts partially mediated the association between father distress and child externalizing and internalizing problems. Father-child interactions characterized by adequate paternal control and child compliance during a toy cleanup task were negatively related to internalizing problems, but were not a mediator. Maternal distress was also a significant factor of the family environment associated with child behavior problems.

The Mediating Role of Father-Child Interactive Quality

Father-Child Interactions During Free Play. The results of this study confirmed the hypothesis of a relation between fathers' distress and behaviors in children. Thus, the more fathers experienced psychological distress, the more likely children showed internalizing and externalizing problems, as reported by both fathers and mothers. Our results are consistent with those obtained by Connell and Goodman (2002) in their meta-analysis, which included studies on children and adolescents from the community and clinical populations. In addition, they also further our understanding by substantiating the mediating effect, albeit partial, of the quality of father-child interactions during free play in the association between father distress and child internalizing and externalizing behavior problems in a low-income sample. Recent studies have found a mediating effect of conflictual or hostile father-child interactions in the relation between father and child psychopathology (Harold et al., 2011; Kane & Garber, 2009). Taken together and in line with the ecological-transactional model, the results of this study suggest that fathers'

parenting stress and levels of symptomatology are associated with less availability and affectionate behaviors and more negativity, irritation, or confrontation during free play. When exposed to such interactive patterns, children may develop inappropriate or problematic emotion regulation strategies (Cicchetti & Lynch, 1993; Conger et al., 2000).

Although quality of father-child interactions during free play was identified as a significant mediating mechanism, it only partially mediated the relation between father distress and child internalizing and externalizing behavior. Genetics could be another potential mechanism in the transmission of mental health issues, such as seen in depression (Sullivan, Neale, & Kendler, 2000). For instance, in Harold et al.'s (2011) study, the mediating role of hostile behaviors in the association between father and child depression symptoms was only found in biologically-related dyads. Children of depressed parents are also more likely to experience a depressive episode at some point in their lives than children of non-depressed parents (Lieb, Isensee, Höfler, Pfister, & Wittchen, 2002). Future studies should consider the genetic contribution in the relation between fathers' psychological distress and child maladjustment.

Contrary to the findings of our study, some studies have not identified father-child interactions as a mediator between father and child adaptation. For instance, in Harold and colleagues' study (2011) paternal hostility but not paternal warmth was a significant mediator. This discrepancy could be explained by differences in the methods used in studies. For instance, in Harold et al.'s study, fathers evaluated their own warmth behaviors using a self-report questionnaire. In addition, the larger child age range in their study (4 to 10 year old children) may have influenced the results, given that parental warmth and sensitivity have shown to vary according to child age (Hallers-Haalboom, Mesman, Groeneveld, Endendijk, van Berkel, van der Pol, & Bakermans-Kranenburg, 2014; Jagers, Bolland, Tomek, Church, Hooper, Bolland, & Bolland, 2017). Additionally, two recent meta-analyses, combining effect sizes of more than a

thousand studies, showed that child age moderates the association between parental warmth and behavior problems (Pinquart, 2017a, 2017b). In our study, the choice of an observational measure over a self-report questionnaire of father-child interactions and the use of a measure that considers both partners of the dyad could also explain our results. Observational measures of parenting behaviors are recommended, especially with parents reporting higher levels of distress or from lower SES backgrounds where significantly lower agreement has been found between self-reports and observational measures of parenting (Herbers, Garcia, & Obradović, 2017). However, in Pinquart's meta-analyses, the magnitude of the association between parental warmth and child behavior problems was similar for studies with self-reports or observational measures of parenting.

The inclusion of maternal distress in the father-child mediating path contributed to providing a more comprehensive picture of the fathers' role in the family. Interestingly once maternal distress was controlled for in the analyses, the partial mediating role of father-child interactive quality in the association between father distress and child adjustment remained significant. This result, which should be interpreted cautiously considering the lack of statistical power, indicated that although maternal distress was significantly related to father distress, child behavior problems, and quality of father-child interaction during free play, it did not alter the mediating path linking father distress to child adjustment. Hence, the father-child interaction context appears as an important path of parent-to-child transmission of risk and adaptation.

Father-Child Interactions During the Toy Cleanup Task. The results of this study showed that paternal negative control/disengagement and child noncompliant behaviors during cleanup were related to child internalizing problems. However, these parent-child interactive behaviors were neither related to child externalizing problems, nor to paternal distress. Thus, the mediation models examining the quality of the parent-child interaction in the cleanup task were

not supported. One possible explanation for this absence of mediation has to do with the context in which the interaction took place. A structured task where the father must provide a framework and achieve a specific goal with the child is a context that may fail to reveal the father's psychological difficulties or strengths due to the inherent structure of the task. Studies have found that fathers generally take on a more directive style with their child compared to mothers, both in physical or pretend play (Kazura, 2000; Kerns & Barth, 1995). Given that fathers seem typically comfortable with structured tasks, such a context might make it more difficult to observe whether dyadic interaction differs as a function of fathers' distress. Conversely, the unstructured free play situation may be more conducive to the transmission of difficulties and strengths from father to child, given that the absence of clear instructions compels fathers to rely on their internal resources to interact with their child. Indeed, our results indicated that fathers' distress was associated with quality of interactions in the unstructured free play situation, but not significantly related to paternal negative control/disengagement and child noncompliant behaviors in the structured toy cleanup task. These findings are consistent with what was found with mothers in a meta-analysis, where effect sizes of the association between mothers' depressive symptoms and parenting behaviors were significantly stronger for studies that assessed mothers' behaviors in unstructured compared to structured tasks (Lovejoy, Graczyk, P. A., O'Hare, E., & Neuman, 2000). More recent studies have also shown that free play is more suited than a structured task to assess parenting behaviors in observational contexts (Branger, Emmen, Woudstra, Alink, & Mesman, 2019; Kwon, Bingham, Lewsader, Jeon, & Elicker, 2013).

Noteworthy, scores for the toy cleanup task included fathers' negative control and disengagement as well as child noncompliant behaviors on the lower end of the scale. Because negative control and disengagement are two distinct types of negative parenting styles (Kuppens & Ceulemas, 2019), combining both might have blurred study results. Furthermore, given that the

toy cleanup task lasted only two minutes, a longer task may more likely highlight the mediating role of paternal control and child compliance behaviors. A structured context spread over a longer period of time might allow for the observation of how consistently fathers are able to provide support and structure for the entire duration of the task and how children respond to paternal behaviors and demands.

Alternative Hypotheses: Bidirectionality of Effects and Other Potential Mechanisms at Play

Our research design does not allow for the assessment of direction of associations between study variables. Past empirical research has suggested bidirectional associations between parents' distress, parenting behaviors and child adaptation (Patterson & Fisher, 2002). These results, which are also in line with the ecological-transactional model, yield an alternative interpretation of study results. Indeed, challenging children who display difficult behaviors could create an additional burden for parents who may lack the resources to meet their children's specific needs. These parents may then engage in ineffective parenting behaviors that can exacerbate children's difficulties. This downward spiral could in turn intensify parental distress, particularly in parents with limited financial resources. Longitudinal studies are needed to better understand the reciprocal relations between fathers' and children's adaptation.

The father-child dyad is generally embedded in a larger family environment and more studies are now shifting towards a family-oriented approach. Others mechanisms outside the father-child dyad have been tested to account for the intergenerational transmission of psychopathology. For instance, maternal depression and couple conflict mediated the association between paternal depression and child outcomes at ages 3.5 and 7 (Gutierrez-Galve, Stein, Hanington, Heron, & Ramchandani, 2015). Another study also showed that psychopathology was transmitted from fathers to their offspring through psychosocial mechanisms such as fathers' employment problems and drug use (Auty, Farrington, & Coid, 2015). Taken together, these

results suggest that other mediating mechanisms not assessed in the present study could account for the association between father and child adaptation. In accordance with Dagan and Sagi-Schwartz's (2018) paper on attachment, considering the child's relationships with both parents allows studies to test additive, buffering, hierarchical, and horizontal models that may better inform on how the mother-child and father-child relationships coordinate to predict child adjustment.

Limitations, Strengths and Conclusions of the Study

Some limitations of our study must be mentioned. First, recruiting families at socioeconomic risk is a challenge. A small percentage of the families who were contacted agreed to participate in the study. Thus, families who agreed to participate may not be representative of all low-income families. It is important to note that the two coding systems used for the evaluation of father-child interactions in the free play situation and the toy cleanup task were not initially designed for fathers. Thus, these coding systems may not have adequately captured some interactional signs that are specific to father-child dyads, and the concepts studied may not optimally represent what is most characteristic of father-child dyads. To date, while there is some interesting progress in this field, there are still very few evaluation and intervention tools developed and tailored specifically to fathers' parenting style. Finally, because of the cross-sectional nature of our research design, the directionality of the findings is subject to debate.

Despite these limitations, the results of our study suggest that the quality of parent-child interactions during free play is a mechanism linking father distress and child behavior problems. However, interactions characterized by paternal negative control/disengagement and child noncompliant behaviors in a toy cleanup task were not found to be a significant mediator. These results highlight the need to assess father-child interactions in unstructured ecologically valid contexts. This type of interactional context is also well-suited to fathers as an intervention

modality, given that playtime moments are generally situations in which they are positively involved with their child (Barker et al., 2017). Also, although most studies conducted with fathers have targeted families in which fathers have a stable socio-professional status and provide for their family, our study underlines the need to include at-risk fathers (living in situations of financial insecurity or other contexts of vulnerability) in research and intervention projects, as they are at risk of experiencing psychological distress. Finally, the results of our study underscore the need to identify, not only children with behavior problems, but also fathers suffering from psychological distress, as the two are related, and suggest that the father-child relationship (through free play) may provide effective clinical leverage to support father and child adaptation.

References

- Abidin, R. (1995). *Manual for the parenting stress index*. Odessa, FL: Psychological Assessment Resources.
- Achenbach, T. M., & Rescorla, L. A. (2000). *Manual for the ASEBA preschool forms and profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families.
- Auty, K. M., Farrington, D. P., & Coid, J. W. (2015). Intergenerational transmission of psychopathy and mediation via psychosocial risk factors. *The British Journal of Psychiatry*, 206(1), 26-31.
- Barker, B., Iles, J. E., & Ramchandani, P. G. (2017). Fathers, fathering and child psychopathology. *Current Opinion in Psychology*, 15, 87-92.
- Branger, M. C., Emmen, R. A., Woudstra, M. L. J., Alink, L. R., & Mesman, J. (2019). Context matters: Maternal and paternal sensitivity to infants in four settings. *Journal of Family Psychology*, 33(7), 851-856.
- Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, 32, 513-531.
- Burbach, A. D., Fox, R. A., & Nicholson, B. C. (2004). Challenging behaviors in young children: The father's role. *The Journal of Genetic Psychology*, 165(2), 169-189.
- Bureau, J. F., Yurkowski, K., Schmiedel, S., Martin, J., Moss, E., & Pallanca, D. (2014). Making children laugh: Parent-child dyadic synchrony and preschool attachment. *Infant Mental Health Journal*, 35(5), 482-494.
- Cabrera, N., & Mitchell, S. (2009). An exploratory study of fathers' parenting stress and toddlers' social development in low-income African American families. *Fathering*, 7(3), 201-225.

- Calzada, E. J., Eyberg, S. M., Rich, B., & Querido, J. G. (2004). Parenting disruptive preschoolers: Experiences of mothers and fathers. *Journal of Abnormal Child Psychology*, 32(2), 203-213.
- Cicchetti, D., & Lynch, M. (1993). Toward an ecological/transactional model of community violence and child maltreatment: Consequences for children's development. *Psychiatry: Interpersonal and Biological Processes*, 56(1), 96-118.
- Conger, K. J., Rueter, M. A., & Conger, R. D. (2000). The role of economic pressure in the lives of parents and their adolescents: The Family Stress Model. In L. J. Crockett & R. K. Silbereisen (Eds.), *Negotiating adolescence in times of social change* (pp. 201-223). New York, NY: Cambridge University Press.
- Connell, A. M., & Goodman, S. H. (2002). The association between psychopathology in fathers versus mothers and children's internalizing and externalizing behavior problems: A meta-analysis. *Psychological Bulletin*, 128(5), 746-773.
- Dagan, O., & Sagi-Schwartz, A. (2018). Early attachment network with mother and father: An unsettled issue. *Child Development Perspectives*, 12(2), 115-121.
- Derogatis, L. R. (1993). *Brief Symptom Inventory: BSI; Administration, scoring, and procedures manual*. Minneapolis, MN: Pearson.
- Derogatis, L. R., & Melisaratos, N. (1983). The brief symptom inventory: An introductory report. *Medicine*, 13(3), 595-605.
- Dubois-Comtois, K., Cyr, C., & Moss, E. (2011). Attachment behavior and mother-child conversations as predictors of attachment representations in middle childhood: A longitudinal study. *Attachment & Human Development*, 13(4), 335-357.
- Dubois-Comtois, K., & Moss, E. (2004). Relation entre l'attachement et les interactions mère-enfant en milieu naturel et expérimental à l'âge scolaire. *Canadian Journal of Behavioral Science/Revue canadienne des sciences du comportement*, 36(4), 267-279.

- Dumas, J. E., & Wahler, R. G. (1983). Predictors of treatment outcome in parent training: Mother insularity and socioeconomic disadvantage. *Behavioral Assessment*, 5(4), 301-313.
- Eiden, R. D., Colder, C., Edwards, E. P., & Leonard, K. E. (2009). A longitudinal study of social competence among children of alcoholic and nonalcoholic parents: Role of parental psychopathology, parental warmth, and self-regulation. *Psychology of Addictive Behaviors*, 23(1), 36-46.
- Evans, G. W., & Kim, P. (2010). Multiple risk exposure as a potential explanatory mechanism for the socioeconomic status-health gradient. *Annals of the New York Academy of Sciences*, 1186(1), 174-189.
- Evans, G. W., & Kim, P. (2013). Childhood poverty, chronic stress, self-regulation, and coping. *Child Development Perspectives*, 7(1), 43-48.
- Feil, E.G., Walker, H., Severson, H., & Ball, A. (2000). Proactive screening for emotional/behavioral concerns in Head Start preschools: Promising practices and challenges in applied research. *Behavioral Disorders*, 26, 13-25.
- Feldman, R., & Klein, P. S. (2003). Toddlers' self-regulated compliance to mothers, caregivers, and fathers: Implications for theories of socialization. *Developmental Psychology*, 39(4), 680.
- Flanders, J. L., Simard, M., Paquette, D., Parent, S., Vitaro, F., Pihl, R. O., & Séguin, J. R. (2010). Rough-and-tumble play and the development of physical aggression and emotion regulation: A five-year follow-up study. *Journal of Family Violence*, 25(4), 357-367.
- Goodman, J. H. (2008). Influences of maternal postpartum depression on fathers and on father–infant interaction. *Infant Mental Health Journal*, 29(6), 624-643.

- Gutierrez-Galve, L., Stein, A., Hanington, L., Heron, J., & Ramchandani, P. (2015). Paternal depression in the postnatal period and child development: Mediators and moderators. *Pediatrics*, *135*(2), e339-e347.
- Hallers-Haalboom, E. T., Mesman, J., Groeneveld, M. G., Endendijk, J. J., van Berkel, S. R., van der Pol, L. D., & Bakermans-Kranenburg, M. J. (2014). Mothers, fathers, sons and daughters: Parental sensitivity in families with two children. *Journal of Family Psychology*, *28*(2), 138.
- Harold, G. T., Rice, F., Hay, D. F., Boivin, J., Van Den Bree, M., & Thapar, A. (2011). Familial transmission of depression and antisocial behavior symptoms: Disentangling the contribution of inherited and environmental factors and testing the mediating role of parenting. *Psychological Medicine*, *41*(6), 1175-1185.
- Harvey, E., Stoessel, B., & Herbert, S. (2011). Psychopathology and parenting practices of parents of preschool children with behavior problems. *Parenting: Science and Practice*, *11*(4), 239-263.
- Herbers, J. E., Garcia, E. B., & Obradović, J. (2017). Parenting assessed by observation versus parent-report: Moderation by parent distress and family socioeconomic status. *Journal of Child and Family Studies*, *26*(12), 3339-3350.
- Hoff, E., Laursen, B., & Tardif, T. (2002). Socioeconomic status and parenting. *Handbook of parenting Volume 2: Biology and Ecology of Parenting*, *8*(2), 231-252.
- Holtz, C. A., Fox, R. A., & Meurer, J. R. (2015). Incidence of behavior problems in toddlers and preschool children from families living in poverty. *The Journal of Psychology*, *149*(2), 161-174.
- Hosmer Jr, D. W., Lemeshow, S., & Sturdivant, R. X. (2013). *Applied logistic regression*. John Wiley & Sons.

- Hu, L. & Bentler, P. (1999). Cutoff criteria for fit indices in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1-55.
- Jagers, J. W., Bolland, A. C., Tomek, S., Church, W. T., Hooper, L. M., Bolland, K. A., & Bolland, J. M. (2017). Does biology matter in parent–child relationships? Examining parental warmth among adolescents from low-income families. *Journal of Family Issues*, 38(2), 225-247.
- Kane, P., & Garber, J. (2009). Parental depression and child externalizing and internalizing symptoms: Unique effects of fathers' symptoms and perceived conflict as a mediator. *Journal of Child and Family Studies*, 18(4), 465-472.
- Kazura, K. (2000). Fathers' qualitative and quantitative involvement: An investigation of attachment, play, and social interactions. *The Journal of Men's studies*, 9(1), 41-57.
- Kerns, K. A., & Barth, J. M. (1995). Attachment and play: Convergence across components of parent-child relationships and their relations to peer competence. *Journal of Social and Personal Relationships*, 12(2), 243-260.
- Kettani, M., Troupel-Cremel, O., & Pinel-Jacquemin, S. (2011). L'adaptation socioaffective des enfants de 2 à 6 ans en situation de précarité : le rôle de l'engagement paternel. *Empan*, 84(4), 139-144.
- Kline, Rex B. (2011). *Principles and practice of structural equation modeling*. New York: Guilford Press,
- Kochanska, G., & Aksan, N. (1995). Mother-child mutually positive affect, the quality of child compliance to requests and prohibitions, and maternal control as correlates of early internalization. *Child Development*, 66(1), 236-254.
- Kuppens, S., & Ceulemans, E. (2019). Parenting styles: A closer look at a well-known concept. *Journal of Child and Family Studies*, 28(1), 168-181.

- Kwon, K. A., Bingham, G., Lewsader, J., Jeon, H. J., & Elicker, J. (2013). Structured task versus free play: The influence of social context on parenting quality, toddlers' engagement with parents and play behaviors, and parent-toddler language use. *Child & Youth Care Forum*, 42, 207-224.
- Lee, S. J., Pace, G. T., Lee, J. Y., & Knauer, H. (2018). The association of fathers' parental warmth and parenting stress to child behavior problems. *Children and Youth Services Review*, 91, 1-10.
- Letourneau, N. L., Duffett-Leger, L., Levac, L., Watson, B., & Young-Morris, C. (2013). Socioeconomic status and child development: A meta-analysis. *Journal of Emotional and Behavioral Disorders*, 21(3), 211-224.
- Lieb, R., Isensee, B., Höfler, M., Pfister, H., & Wittchen, H. U. (2002). Parental major depression and the risk of depression and other mental disorders in offspring: A prospective-longitudinal community study. *Archives of General Psychiatry*, 59(4), 365-374.
- Lovejoy, M. C., Graczyk, P. A., O'Hare, E., & Neuman, G. (2000). Maternal depression and parenting behavior: A meta-analytic review. *Clinical Psychology Review*, 20(5), 561-592.
- Low, S. M., & Stocker, C. (2005). Family functioning and children's adjustment: Associations among parents' depressed mood, marital hostility, parent-child hostility, and children's adjustment. *Journal of Family Psychology*, 19(3), 394-403.
- Luby, J. L. (2017). *Handbook of preschool mental health: Development, disorders, and treatment. Second edition*. New York: The Guilford Press.
- Magnuson, K. A., & Duncan, G. J. (2002). Parents in poverty. *Handbook of Parenting*, 4, 95-121.
- Marvin, R. S., Britner, P. A., & Russell, B. S. (2016). Normative development. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (pp. 273-289). New York, NY: Guilford Press.

- Moss, E., Cyr, C., Bureau, J. F., Tarabulsky, G. M., & Dubois-Comtois, K. (2005). Stability of attachment during the preschool period. *Developmental Psychology*, 41(5), 773.
- Neece, C. L., Green, S. A., & Baker, B. L. (2012). Parenting stress and child behavior problems: A transactional relationship across time. *American Journal on Intellectual and Developmental Disabilities*, 117(1), 48-66.
- Neppl, T. K., Senia, J. M., & Donnellan, M. B. (2016). Effects of economic hardship: Testing the family stress model over time. *Journal of Family Psychology*, 30(1), 12-21.
- Newton, E. K., Laible, D., Carlo, G., Steele, J. S., & McGinley, M. (2014). Do sensitive parents foster kind children, or vice versa? Bidirectional influences between children's prosocial behavior and parental sensitivity. *Developmental Psychology*, 50, 1808-1817.
- Patterson, G. R., & Fisher, P. A. (2002). Recent developments in our understanding of parenting: Bidirectional effects, causal models, and the search for parsimony. In M. H. Bornstein (Ed.), *Handbook of parenting: Vol. 5: Practical issues in parenting* (2nd ed., pp. 59 – 88). Mahwah, NJ: Lawrence Erlbaum Associates.
- Pinquart, M. (2017a). Associations of parenting dimensions and styles with externalizing problems of children and adolescents: An updated meta-analysis. *Developmental Psychology*, 53(5), 873-932.
- Pinquart, M. (2017b). Associations of parenting dimensions and styles with internalizing symptoms in children and adolescents: A meta-analysis. *Marriage & Family Review*, 53(7), 613-640.
- Ponnet, K., Van Leeuwen, K., & Wouters, E. (2014). Examining mediating pathways between financial stress of mothers and fathers and problem behaviour in adolescents. *Journal of Family Studies*, 20(1), 66-78.

- Sullivan, P. F., Neale, M. C., & Kendler, K. S. (2000). Genetic epidemiology of major depression: Review and meta-analysis. *American Journal of Psychiatry*, 157, 1552-1562.
- Trautmann-Villalba, P., Gschwendt, M., Schmidt, M. H., & Laucht, M. (2006). Father–infant interaction patterns as precursors of children’s later externalizing behavior problems. *European Archives of Psychiatry and Clinical Neuroscience*, 256(6), 344-349.
- Vallotton, C., Harewood, T., Froyen, L., Brophy-Herb, H., & Ayoub, C. (2016). Child behavior problems: Mothers’ and fathers’ mental health matters today and tomorrow. *Early Childhood Research Quarterly*, 37, 81-93.
- Wallander, J. L., Berry, S., Carr, P. A., Peterson, E. R., Waldie, K. E., Marks, E., ... & Morton, S. M. (2019). Patterns of exposure to cumulative risk through age 2 and associations with problem behaviors at age 4.5: Evidence from Growing Up in New Zealand. *Journal of Abnormal Child Psychology*, 47(8), 1277-1288.
- Weijers, D., van Steensel, F. J. A., & Bögels, S. M. (2018). Associations between psychopathology in mothers, fathers and their children: A structural modeling approach. *Journal of Child and Family Studies*, 27(6), 1992-2003.
- Williams, D. T., Cheadle, J. E., & Goosby, B. J. (2015). Hard times and heart break: Linking economic hardship and relationship distress. *Journal of Family Issues*, 36(7), 924-950.

Table 1

Descriptive Statistics of Study Variables

Variables	<i>M</i>	<i>SD</i>	Range
Father distress	-0.004	0.92	-1.37 – 2.23
Mother distress	0.003	0.89	-1.53 – 1.86
Internalizing problems (<i>T</i> scores)	55.80	10.18	31 – 75
Externalizing problems (<i>T</i> scores)	54.47	11.64	31.5 – 84.5
Quality of father-child interactions (free play)	4.42	0.99	2 – 6
Quality of father-child interactions (cleanup task)	0	0.86	-2.47 – .64

Note. For father distress, mother distress, and quality of father-child interactions during the cleanup task, a composite score of combined *z* scores (with a mean of 0) was created. For externalizing and internalizing problems, a mean of fathers' and mothers' scores was computed.

Table 2

Intercorrelations among Study Variables

	1	2	3	4	5	6	7	8	9	10	11
1. Father distress ($n = 66$)	--										
2. Mother distress ($n = 69$)	.76***	--									
3. Internalizing problems ($n = 64$)	.65***	.70***	--								
4. Externalizing problems ($n = 64$)	.55***	.54**	.80***	--							
5. Free play interactions ($n = 81$)	-.31*	-.24*	-.42**	-.43***	--						
6. Cleanup interactions ($n = 81$)	-.16	-.07	-.29*	-.27*	.38***	--					
7. Child gender ($n = 81$)	.12	.02	-.01	-.12	.05	.09	--				
8. Child age ($n = 81$)	-.09	-.18	-.14	-.07	.18	.06	-.06	--			
9. Father age ($n = 75$)	-.02	-.07	.04	-.14	-.13	-.11	.03	-.00	--		
10. Father education ($n = 75$)	-.02	-.04	.06	-.17	.22 [†]	.12	.19	-.10	.31**	--	
11. Family income ($n = 75$)	.09	.17	.02	.02	.06	-.02	.02	.04	.08	.16	
12. Number of children ($n = 78$)	-.19	-.14	-.18	-.14	-.02	.08	.02	-.04	.08	-.05	.04

[†] $p < .10$; * $p < .05$; ** $p < .01$

Table 3

Analyses Testing the Mediating Role of Father-Child Interactions in the Association Between
Father Distress and Child Behavior Problems

	b	se	p-value	Beta
Father-child interactions during free play				
Number of children ^a	-0.29	0.50	0.57	-0.04
Father education ^b	-2.93	1.18	0.01	-0.19
a path : Father distress → Interactions	-0.31	0.14	0.02	-0.28
b1 path : Interactions → Internalizing	-2.49	1.06	0.02	-0.25
b2 path : Interactions → Externalizing	-2.95	1.28	0.02	-0.26
c'1 path : Father distress → Internalizing	6.25	1.04	0.00	0.58
c'2 path : Father distress → Externalizing	5.97	1.20	0.00	0.48
Father-child interactions during cleanup task				
Number of children ^a	-0.21	0.52	0.70	-0.03
Father education ^b	-3.14	1.22	0.01	-0.21
a path : Father distress → Interactions	-0.14	0.11	0.17	-0.15
b1 path : Interactions → Internalizing	-2.39	1.19	0.05	-0.21
b2 path : Interactions → Externalizing	-2.46	1.58	0.12	-0.19
c'1 path : Father distress → Internalizing	6.74	1.08	0.00	0.63
c'2 path : Father distress → Externalizing	6.58	1.26	0.00	0.54

Note. For father-child interactions during free play: $N = 81$; Number of parameters = 19; Chi-Square = 10.440, $df = 8$, $p = 0.236$; RMSEA = 0.06 (90% CI: .00 – .15); CFI = 0.98. For father-child interactions during the cleanup task: $N = 81$; Number of parameters = 19; Chi-Square = 6.975, $df = 8$, $p = 0.539$; RMSEA = 0.00 (90% CI: .00 – .12); CFI = 1.00.

^aCovariate on internalizing problems; ^bCovariate on externalizing problems.

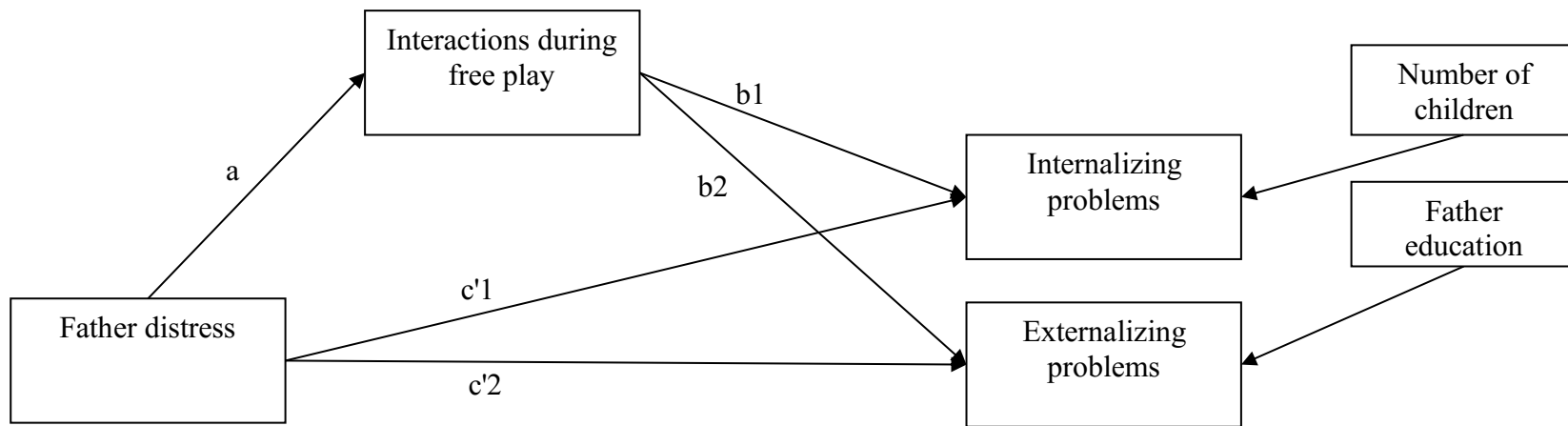


Figure 1a

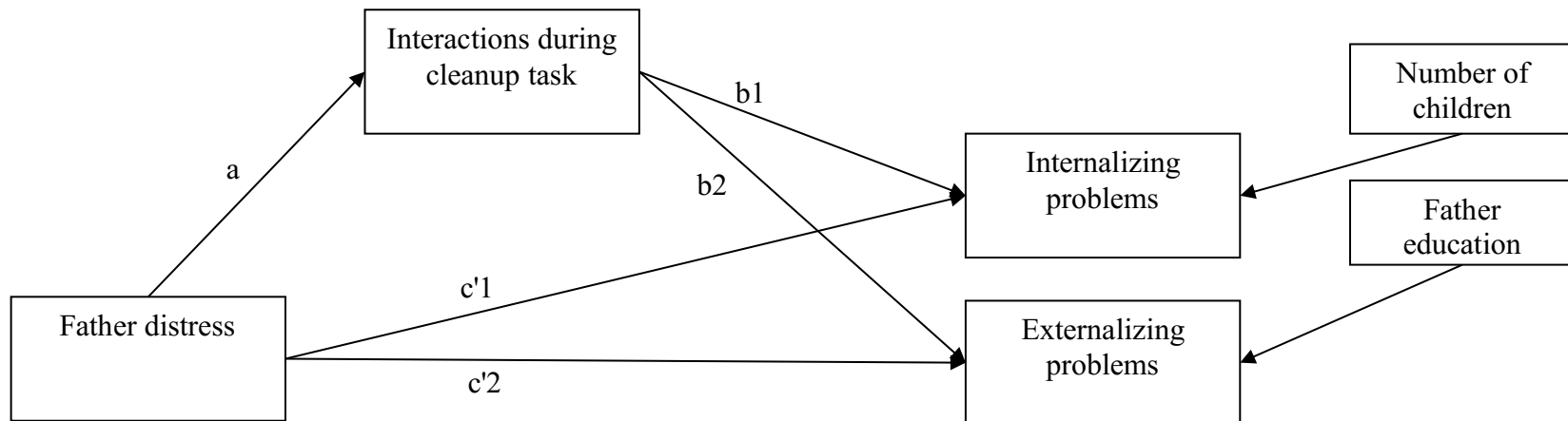


Figure 1b

Figure 1. Models Testing the Mediating Role of Father-Child Interactions in the Association Between Father Distress and Child Behavior Problems