

FAMILY MEN: FATHERS AS COPARENTS IN DIVERSE CONTEXTS AND FAMILY STRUCTURES

EDITED BY: Sarah E. DeMartini, Nancy Hazen, Martin I. Gallegos,
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PUBLISHED IN: Frontiers in Psychology





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ISSN 1664-8714

ISBN 978-2-88976-844-8

DOI 10.3389/978-2-88976-844-8

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FAMILY MEN: FATHERS AS COPARENTS IN DIVERSE CONTEXTS AND FAMILY STRUCTURES

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Citation: DeMartini, S. E., Hazen, N., Gallegos, M. I., Carone, N., Altenburger, L., eds. (2022). Family Men: Fathers as Coparents in Diverse Contexts and Family Structures. Lausanne: Frontiers Media SA. doi: 10.3389/978-2-88976-844-8

Table of Contents

- 04 Editorial: Family Men: Fathers as Coparents in Diverse Contexts and Family Structures**
Sarah E. DeMartini, Lauren E. Altenburger, Nancy L. Hazen,
Martin I. Gallegos and Nicola Carone
- 07 Coparenting Alleviated the Effect of Psychological Distress on Parental Psychological Flexibility**
Yongju Yu and Yan Xiao
- 16 Coparenting and Parental Involvement During School Transition Among Chinese Mothers and Fathers: Children's School Liking as a Moderator**
Sisi Tao and Eva Yi Hung Lau
- 26 Material Hardship in Families With Low Income: Positive Effects of Coparenting on Fathers' and Mothers' Parenting and Children's Prosocial Behaviors**
Joyce Y. Lee, Brenda L. Volling and Shawna J. Lee
- 45 When Fathers Feel Socially Constrained to Assume a Role: A Negative Predictor of the Coparental Relationship in Switzerland**
Nicolas Favez, Aline Max, Michel Bader and Hervé Tissot
- 55 Fathers' Sensitivity in Infancy and Externalizing Problems in Middle Childhood: The Role of Coparenting**
Deborah Jacobvitz, Ashleigh I. Aviles, Gabriela A. Aquino, Ziyu Tian,
Shuqi Zhang and Nancy Hazen
- 66 Disentangling the Effect of Sex and Caregiving Role: The Investigation of Male Same-Sex Parents as an Opportunity to Learn More About the Neural Parental Caregiving Network**
Michele Giannotti, Micol Gemignani, Paola Rigo, Alessandra Simonelli,
Paola Venuti and Simona De Falco
- 71 Resident and Non-resident Father Involvement, Coparenting, and the Development of Children's Self-Regulation Among Families Facing Economic Hardship**
Lauren E. Altenburger
- 85 Untangling Caregiving Role From Parent Gender in Coparenting Research: Insights From Gay Two-Father Families**
Nicola Carone and Vittorio Lingiardi
- 90 The Role of Paternal Parenting and Co-parenting Quality in Children's Academic Self-Efficacy**
Demet Kara and Nebi Sümer



OPEN ACCESS

EDITED AND REVIEWED BY
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SPECIALTY SECTION
This article was submitted to
Gender, Sex and Sexualities,
a section of the journal
Frontiers in Psychology

RECEIVED 22 June 2022
ACCEPTED 08 July 2022
PUBLISHED 22 July 2022

CITATION
DeMartini SE, Altenburger LE,
Hazen NL, Gallegos MI and Carone N
(2022) Editorial: Family men: Fathers as
coparents in diverse contexts and
family structures.
Front. Psychol. 13:975991.
doi: 10.3389/fpsyg.2022.975991

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Editorial: Family men: Fathers as coparents in diverse contexts and family structures

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KEYWORDS

coparenting, fathers, gay fathers, diverse family contexts, underrepresentation

Editorial on the Research Topic

Family Men: Fathers as Coparents in Diverse Contexts and Family Structures

Fathers' involvement in childrearing has increased during the past several decades (Pattnaik, 2013; Livingston and Parker, 2019). Recent studies have suggested that fathers exert significant direct and indirect influences on child development and partner relationship quality *via* coparenting—how parents work with or against each other to care for their children (e.g., Farr and Patterson, 2013; Kuo et al., 2017; McHale et al., 2019; Schoppe-Sullivan and Fagan, 2020). High-quality father involvement has been shown to positively influence family dynamics (e.g., Green et al., 2019; DeMartini and Hazen, 2021). However, the majority of studies to date have focused largely on fathers' coparenting among middle class families headed by different-sex couples. Families across the globe have become increasingly diverse and children are parented within a variety of family structures. Thus, understanding the contribution of fathers across different contexts can offer new insights into modern fatherhood.

The goal of our Research Topic was to explore fathers' roles in coparenting with fathers as research participants. Nine contributing papers from across the globe examined fatherhood within same-sex couples, as well as in broader contexts that are more reflective of contemporary families and actual, representative familial experiences, such as fathers of multiple children, across family transitions, as well as from diverse cultural, ethnic, and racial backgrounds. Our Research Topic contributions highlight

novel methods and analyses, which shed light on how fathers' involvement exerts unique influences on family dynamics.

The first seven articles in our Research Topic were quantitative research studies that explored the impact of fathers from diverse family structures on family members and dynamics. Notably, participating fathers come from across the globe, including China, Switzerland, Turkey, and the United States. Broad findings from the studies are summarized below.

Our first article explored the impact of psychological distress on parents' psychological flexibility (cognitive defusion, committed action, acceptance) on coparenting quality in Chinese fathers and mothers (Yu and Xiao). Structural equation modeling revealed that coparenting partially mediated the impact of anxiety on cognitive defusion and fully mediated the impact of depression on cognitive defusion and acceptance. Additionally, coparenting was found to moderate the associations between anxiety and cognitive defusion, as well as anxiety and acceptance.

The next article investigated the association between material hardship and children's prosocial behaviors by utilizing a risk and resilience framework in a socioeconomically disadvantaged sample of father-mother families of preschoolers in the United States (Lee et al.). Structural equation modeling revealed coparenting alliance related to higher levels of both mothers' and fathers' parenting, and in turn, responsive parenting was associated with higher levels of children's prosocial behaviors. Mothers' and fathers' responsive parenting mediated the indirect effects of coparenting alliance on children's prosocial behavior.

Results from Favez et al.'s study explored Swiss fathers' motivations to assume a particular role within the family across the transition to parenthood using multivariate general linear models. Findings from the study suggest reasons for role distributions were economical, practical, and to meet personal expectations. The coparenting relationship was shown to be impacted by age and deliberate choices in role distributions.

Our fourth article examined coparenting, parenting involvement, and children's school liking across the transition to primary school in China (Tau and Lau). Children's school liking was examined as a moderator between each parent's involvement in relation to coparenting cooperation and triangulation. Results highlighted the importance of paternal and maternal cooperation and the negative impact of triangulation on family dynamics.

Kara and Sümer's article showcased the importance of parental warmth and consistency on children's academic self-efficacy in Turkey *via* regression analyses. Findings suggested that fathers' warmth positively impacts boys' math self-efficacy. In addition, consistent coparenting efforts related to higher overall academic achievement.

Our sixth article explored the degree to which United States resident and non-resident fathers' coparenting as well as

parenting quality and quantity related to children's ability to self-regulate their behaviors *via* path analyses (Altenburger). Findings from this study highlighted the importance of focusing on the promotion of positive father-child relationships in diverse family contexts. For instance, high levels of non-resident fathers' involvement related to children's increased ability to self-regulate.

Jacobvitz et al.'s study examined United States fathers' sensitivity and coparenting quality in the first 2 years of life following the transition to parenthood in relation to children's externalizing behavior in middle childhood. Structural equation modeling results suggested that fathers' caregiving quality plays an important role in determining coparenting quality and children's later externalizing problems.

The last two articles in our Research Topic article collection are opinion pieces, as informed by empirical work on same-sex fathers' coparenting and related topics. Broad suggestions made by the authors are summarized below.

Our first opinion article reviewed studies that explore the association between neurobiological activations and parental involvement by highlighting the opportunities and challenges of extending and conducting this research on male same-sex parents (Giannotti et al.). Authors suggested that despite difficulties in recruitment, collecting samples of diverse and arguably more representative family structures will provide valuable insight into our field.

Carone and Lingardi's opinion article reviewed recent work that has explored gay fathers' differentiation of caregiving and gender effects. Authors made three marked suggestions to researchers: (1) to consider caregiving roles and parent gender independently, (2) to make comparative analyses that assist in determining whether parent gender or adoption of complementary roles explains differences in coparenting behaviors, and (3) to acknowledge that caregiving roles vary based on contextual circumstances.

Broadly, our Research Topic suggests the importance of distinguishing between and disentangling gender from coparenting efforts, as well as the importance of more inclusive and representative research on fatherhood. Despite the contributions of our Research Topic to extant work on coparenting fathers, gaps remain in the literature. Taken together, we suggest that future researchers continue to examine both parents' perspectives of the coparenting relationship longitudinally, give further attention to same-sex fathers' coparenting in empirical studies, differentiate caregiving efforts from gender, and conduct more international work. Additionally, incorporating observations in naturalistic settings may prove useful in better understanding coparenting relationship quality across diverse family structures. It is our hope that readers will find this Research Topic to be a valuable reference and starting point from which to explore the role of contemporary fathers as coparents in diverse contexts.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships

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Coparenting Alleviated the Effect of Psychological Distress on Parental Psychological Flexibility

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OPEN ACCESS

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Specialty section:

This article was submitted to
Personality and Social Psychology,
a section of the journal
Frontiers in Psychology

Received: 26 December 2020

Accepted: 24 June 2021

Published: 16 July 2021

Citation:

Yu Y and Xiao Y (2021)
Coparenting Alleviated the Effect
of Psychological Distress on Parental
Psychological Flexibility.
Front. Psychol. 12:646380.
doi: 10.3389/fpsyg.2021.646380

Parenting is full of challenges and responsibilities. It is particularly important for parents to be open to parental difficult experiences and adopt behaviors consistent with self-chosen values, which termed as parental psychological flexibility (PPF). However, few studies have focused on the effect of psychological distress (anxiety and depression) on different components of PPF. This study examined the effect of psychological distress on the three components of PPF (cognitive defusion, committed action, and acceptance) as well as the role of coparenting quality in Chinese parents. A total of 462 parents of children aged 1–18 years completed self-report measures of anxiety, depression, coparenting, and PPF. Our results revealed that higher level of PPF went along with less anxiety and depression, while it was also associated with better coparenting quality. Coparenting partially mediated the effect of anxiety on cognitive defusion and acceptance and fully mediated the effect of depression on cognitive defusion and acceptance. Moderation analyses showed that the link between anxiety and cognitive defusion, as well as the link between anxiety and acceptance were moderated by coparenting. We discussed the implications of coparenting as a protective factor in alleviating the negative effect of psychological distress on PPF.

Keywords: anxiety, depression, coparenting, parental psychological flexibility, Chinese parents

INTRODUCTION

No matter which stage your child is in, parenting is full of challenges and responsibilities (Moyer and Sandoz, 2015). New parents may have to learn skills such as how to balance discipline and overcontrol, to teach children basic life skills, as well as to help children improve their social adaptability. Parents of school-age children need to teach their children how to deal with the pressure from learning and peer competition, perplexity in puberty, confusion of self-identity, etc. These experiences bring pain and happiness simultaneously to individuals who are parents. The notion of “parental psychological flexibility (PPF)” provides a new perspective for us to research on parenting.

Parental psychological flexibility is defined as parents’ accepting negative thoughts, emotions and urges about one’s child and still acting in ways that are consistent with effective parenting (Burke and Moore, 2015). PPF can be measured by the Parental psychological flexibility Questionnaire (PPFQ) developed by Burke and Moore (2015). It consists of three factors: cognitive defusion, committed action, and acceptance. Cognitive defusion refers to the ability to separate thoughts, emotions, physical sensations, and urges from the evaluation of specific events and to

select behaviors that are likely to be effective for their context. Committed action refers to the flexible responses based on specific circumstances and personal values. Acceptance is defined as the willingness to experience individual events without changing the frequency or form of events (Burke and Moore, 2015).

Previous studies mainly focus on the positive impact of PPF on child functioning, such as chronic pain (Wallace et al., 2016) and mental health (Teetsel et al., 2014). Little research has been performed to test the impacts of internal and external factors on PPF. Nevertheless, the process model and the family systems theory provide a theoretical perspective for the research of this topic. According to the process model, parental functioning is multiply determined and contextual support and individual psychological well-being can affect parenting (Belsky, 1984). The family systems theory proposed that marital and parent-child relationships are interrelated (Cox and Paley, 2003) and studying the interactions of family members can better illustrate the process of parenting. Accordingly, parents' psychological distress (anxiety and depression), the support and interaction between fathers and mothers in child rearing (termed as coparenting) were studied emphatically in this study.

Emotional distress has been demonstrated to lead parents to use ineffective parenting methods (Bayer et al., 2006). Parents may lack concerns for their children due to excessive involvement in negative experiences, over interfere with their children or adopt inappropriate parenting practice due to constant worry (Moyer and Sandoz, 2015). Anxiety symptoms often lead to less nurturing and more restrictions (Lindhout et al., 2006; Moyer and Sandoz, 2015), while depression symptoms are associated with more negative physical behaviors (Querido et al., 2001) and less verbal communication (Coyne et al., 2007). A recent study demonstrated that anxiety and depression have significant and negative impacts on parenting behaviors and practices (Moreira et al., 2019). Parents with more depression and anxiety symptoms had a stronger tendency to adopt psychological aggression to discipline their children (Wang et al., 2019). Unfortunately, there is still a major gap in our knowledge about the impact of psychological distress on PPF.

According to the family systems theory, the functioning and well-being of a family member depend on the interactions among each one of the whole family (Minuchin, 1974, 1988). As the executive subsystem of the family, coparenting reflects mutual support and coordinate between husband and wife in their roles as parents (Feinberg et al., 2016). Coparenting has been demonstrated to be closely related to family function, parental rearing patterns, and child development (Metz et al., 2018a). Schoppe-Sullivan et al. (2016) reported that mothers' perceptions of stronger supportive coparenting were associated with less parenting stress when parenting self-efficacy was low. It was also found that the severity of parental anxiety was associated with more destructive coparenting, which in turn was related to children's fearful temperament (Metz et al., 2018b). Coparenting quality can easily spill over into the parent-child relationship. A longitudinal study on 69 parental couples revealed that coparenting mediated the relationships between maternal depression symptoms and child symptoms (Tissot et al., 2016).

Another investigation on 182 families showed that maternal coparenting attitudes could predict fathers' active participation (Yan et al., 2018). Such findings suggest the necessity of exploring the mediating/moderating role of coparenting in the relationship between psychological distress and parenting quality. Scrimgeour et al. (2013) found that supportive coparenting may enhance the benefits of positive parenting and buffer the risks of negative parenting on children's prosocial behaviors. Conversely, coparenting conflicts may overwhelm parents' self-management and undermine their ability as sensitive caregivers of their adolescents (Martin et al., 2017). Therefore, the family process model linking parental psychological distress with their PPF was tested in this study. We assume that parents' anxiety and depression are related to a decrease in PPF, which will be regulated by coparenting.

Accordingly, the current study sought to clarify the relationship between psychological distress (i.e., anxiety and depression) and PPF, as well as to test the role of coparenting in Chinese parents of children 1–18 years old. The research hypotheses are as follows:

H1: Less anxiety and depression are related to higher level of PPF.

H2: Less anxiety and depression are related to better coparenting quality.

H3: Better coparenting is associated with higher level of PPF.

H4: Coparenting mediates the link between anxiety, depression, and PPF.

H5: Coparenting serves as a moderator between anxiety, depression, and PPF.

MATERIALS AND METHODS

Participants and Procedures

The current study was approved by the Ethics Committee of Sichuan International Studies University (IRB number: 20200001). All procedures were carried out in accordance with the Declaration of Helsinki. Through online advertisements and the We Chat friends circle, by convenient sampling, 490 parents who had at least one child aged 1–18 years old were recruited from four communities in Chongqing city, China. They completed online self-reported measures of their background information, anxiety, depression, coparenting, and PPF. Nine participants were excluded since their time to fill in the questionnaire was less than 300 s. Besides that, seven single parents and 12 divorced parents were excluded. In the final sample, there were 462 participants (114 fathers and 348 mothers) aged from 20 to 52 years (mean = 36.43, SD = 6.18) and their children aged from 1 to 18 years (mean = 8.15, SD = 5.17). Among these parents, 71 (15.4%) were educated up to less than high school, 63 (13.6%) had completed high school, 224 (48.5%) had junior college or bachelor's degrees, and 104 (22.5%) had master's degrees or above. Of the participants, 310 had only one child, 152 had two or more children. Additionally, there were 159 parents

of toddlers and preschool children (1–5 years old), 98 parents of primary children (6–11 years old), 119 parents of adolescents (12–18 years old), and 86 parents having two or more children at different stages.

Prior to filling in the questionnaire, researchers explained the purpose and contents of this study to all participants. Participants were told that their anonymity and confidentiality would be maintained. Moreover, participants had access to their own results and corresponding explanations as soon as they completed the questionnaire.

Study Measures

Anxiety

The anxiety symptoms of parents over the past 2 weeks were assessed by the seven-item Generalized Anxiety Disorder Questionnaire (GAD-7) (Spitzer et al., 2006; Qu and Sheng, 2015). For example, “Not being able to stop or control worrying”. Each item was rated on a 4-point Likert scale ranging from 0 (not at all) to 3 (nearly every day). According to Qu and Sheng (2015), the GAD-7 has good psychometric properties in Chinese population. The Cronbach’s alpha for GAD-7 was 0.915 in this study.

Depression

The depression symptoms in the past 2 weeks were assessed by the 9-item Patient Health Questionnaire (PHQ-9) (Kroenke et al., 2001; Lai et al., 2010; Zhang et al., 2013). For example, “Thoughts that you would be better off dead or of hurting yourself in some way.” Each item was rated on a 4-point Likert scale ranging from 0 (not at all) to 3 (nearly every day). The higher the score, the more serious the depression is. The PHQ-9 has good reliability and validity in Chinese samples (Lai et al., 2010; Zhang et al., 2013). The Cronbach’s alpha for PHQ-9 was 0.895 in our sample.

Coparenting Quality

Coparenting relationship quality was assessed by using the 14-item Coparenting Relationship Scale (CRS, Feinberg et al., 2012; Wu et al., 2017). For example, “We are growing and maturing together through experiences as parents.” Each item was rated on a 0–6 Likert scale. This scale has been confirmed to possess good psychometric properties in Chinese parents (Wu et al., 2017). The Cronbach’s alpha for the total scale was 0.864 in our sample.

Parental Psychological Flexibility

Psychological flexibility among parents was assessed by the 19-item PPFQ (Burke and Moore, 2015; Li et al., 2018). For example, “My emotions get in the way of the being the type of parent I would ideally like to be.” It comprises three factors: cognitive defusion, committed action, and acceptance. Respondents were asked to rate all items from 1 (never true) to 7 (always true). Chinese version of PPFQ has been proved good reliability and validity (Li et al., 2018). The Cronbach’s alpha values for the cognitive defusion, committed action, and acceptance subscales in our sample were 0.869, 0.718, and 0.815, respectively. Additionally, the Cronbach’s alpha value for the total scale was 0.880 in this study.

Data Analysis

Independent sample *t*-test and one-way ANOVA were carried out to compare the differences of main study variables in gender, number of children, education level, and developmental stage of children. Pearson correlation analyses were performed to describe the associations of study variables and to test initial hypotheses H1, H2, and H3. Structural equation modeling (SEM) was conducted to assess the mediating role of coparenting in the relationships of anxiety, depression, and PPF (hypothesis H4). Hierarchical multiple regression analyses were conducted to examine whether coparenting moderates the associations between anxiety, depression, and PPF (hypothesis H5). $P < 0.05$ indicates statistical significance in the current study. SPSS 24.0 and Amos 18.0 were used for data analyses.

RESULTS

Preliminary Analyses

Table 1 presents the results of descriptive statistics and correlation analyses. It was found that higher scores of three subscales of PPF (cognitive defusion, committed action, and acceptance) went along with less anxiety and depression, while they were related to better coparenting (all P s < 0.01). Meanwhile, anxiety and depression were negatively associated with coparenting (all P s < 0.01). Therefore, our initial hypotheses H1, H2, and H3 were well supported.

Effects of Gender, Education, Number of Children, and Developmental Stage of Children

Independent sample *t*-test was performed to examine the impacts of gender and number of children on anxiety, depression, coparenting, and PPF. No significant difference was found between fathers and mothers in anxiety, depression, coparenting, and PPF (P s > 0.05). Results also revealed that scores of anxiety, depression, coparenting, and PPF for parents with one child were not significantly different from those who had two or more children (P s > 0.05).

In order to examine whether there are differences in study variables among parents of children at different stages, parents were divided into four groups: parents of toddlers and preschool children (1–5 years old), parents of primary children (6–11 years old), parents of adolescents (12–18 years old), and parents having two or more children at different stages. The results of one-way ANOVA are described in **Table 2**. There was no significant group difference in anxiety, depression, and coparenting. However, a significant difference was found in the scores of PPF between groups ($F = 5.82$, $P < 0.01$). LSD *post hoc* tests showed that parents of toddlers and preschool children reported higher levels of PPF than those of other parents (P s < 0.05). No difference was found among the other three groups (P s > 0.05).

As listed in **Table 3**, one-way ANOVA also showed that the effect of education level on PPF was significant ($F = 11.32$, $P < 0.01$). LSD *post hoc* tests showed that scores of PPF for parents with education level less than high school were lower than

TABLE 1 | Correlations, means, and standard deviations for main study variables.

	Possible range	Mean (SD)	Anxiety	Depression	Coparenting
Anxiety	0–21	5.86 (4.77)	–		
Depression	0–27	6.75 (5.29)	0.799**	–	
Coparenting	0–84	56.88 (14.29)	–0.443**	–0.425**	–
Parental psychological flexibility	19–133	88.66 (18.00)	–0.537**	–0.473**	0.395**
Cognitive defusion	8–56	35.67 (10.45)	–0.490**	–0.421**	0.363**
Committed action	5–35	20.00 (6.06)	–0.338**	–0.295**	0.129**
Acceptance	6–42	32.99 (6.16)	–0.406**	–0.377**	0.411**

Note ** $P < 0.01$; $n = 462$.

TABLE 2 | Comparisons in main study variables among parents with child(ren) at different stages.

	Group 1 ($n = 159$)	Group 2 ($n = 98$)	Group 3 ($n = 119$)	Group 4 ($n = 86$)	F	Significance
Anxiety	5.89 \pm 4.76	6.12 \pm 4.99	5.96 \pm 4.64	5.36 \pm 4.78	0.43	None
Depression	7.07 \pm 5.27	6.57 \pm 5.06	6.62 \pm 5.28	6.56 \pm 5.67	0.29	None
Coparenting	58.55 \pm 14.25	54.55 \pm 14.56	56.73 \pm 14.29	56.64 \pm 13.88	1.61	None
Parental psychological flexibility	92.71 \pm 17.81	87.86 \pm 17.66	85.98 \pm 18.01	85.79 \pm 17.66	4.51**	Group 1 > Group 2; Group 1 > Group 3; Group 1 > Group 4

Note ** $P < 0.01$. Group 1, parents of toddlers and preschool children (1–5 years old); Group 2, parents of primary children (6–11 years old); Group 3, parents of adolescents (12–18 years old); Group 4, parents having two or more children at different stages.

TABLE 3 | Comparisons in main study variables among parents with different educational levels.

	Group A ($n = 71$)	Group B ($n = 63$)	Group C ($n = 224$)	Group D ($n = 104$)	F	Significance
Anxiety	6.86 \pm 5.26	6.62 \pm 4.65	5.62 \pm 4.59	5.22 \pm 4.78	2.40	None
Depression	7.73 \pm 6.10	7.63 \pm 5.28	6.67 \pm 4.94	5.73 \pm 5.31	2.74*	A > D; B > D
Coparenting	53.41 \pm 13.87	55.48 \pm 14.59	57.98 \pm 13.99	57.72 \pm 14.76	2.18	None
Parental psychological flexibility	79.37 \pm 17.56	86.37 \pm 14.23	89.48 \pm 16.92	94.63 \pm 19.97	11.32**	A < B; A < C; A < D; B < D; C < D

Note * $P < 0.05$; ** $P < 0.01$. A, less than high school; B, high school education; C, junior college or bachelor's degree; D, master's degree or above.

those of other three groups, while scores of PPF for parents with master's degrees or above were higher than those of other three groups. Besides that, levels of depression were significantly higher for parents who completed high school or below than parents who had master's degrees or above ($P_s < 0.05$).

Mediation Analyses

Structural equation modeling was performed by AMOS 18.0 to explore the mediating role in the associations of anxiety, depression, and PPF. In the original model of **Figure 1**, four pathways did not reach significance (depression \rightarrow cognitive defusion: $b = -0.10$, $P = 0.47$; depression \rightarrow committed action: $b = -0.09$, $P = 0.31$; depression \rightarrow acceptance: $b = -0.11$, $P = 0.18$; and coparenting \rightarrow committed action: $b = -0.01$, $P = 0.51$). Therefore, we deleted these four non-significant pathways individually. After recalculation, the modified model (**Figure 1**) revealed a good model fit: $\chi^2(4) = 2.980$, $P = 0.40$, CFI = 1.000, TLI = 1.000, GFI = 0.998, SRMR = 0.011, and RMSEA < 0.001. It explained 21.0% of coparenting variance, 26.9% of cognitive defusion variance, 11.4% of committed action variance, and 23.2% of acceptance variance. In this model, the

results indicated that anxiety had direct negative impacts on cognitive defusion ($b = -0.40$, $P < 0.01$), committed action ($b = -0.34$, $P < 0.01$), and acceptance ($b = -0.28$, $P < 0.01$). Anxiety also exerted indirect negative impacts on cognitive defusion ($b = -0.06$, $P < 0.01$) and acceptance ($b = -0.08$, $P < 0.01$) through coparenting. Moreover, depression only had indirect negative effects on cognitive defusion ($b = -0.04$, $P < 0.01$) and acceptance ($b = -0.06$, $P < 0.01$) through coparenting.

According to previous studies (MacKinnon et al., 2004; Cheong and MacKinnon, 2012), bootstrapping procedures via Amos 18.0 ($k = 2,000$) were carried out to test the significance of the indirect effects. As indicated in **Table 4**, both anxiety and depression exerted significantly indirect impacts on cognitive defusion and acceptance through coparenting. Sum up, coparenting partially mediated the impacts of anxiety on cognitive defusion and acceptance, while coparenting fully carried the impacts of depression on cognitive defusion and acceptance, rather than committed action. Therefore, the hypothesis H4 that coparenting mediates the link between anxiety, depression, and PPF was partially supported.

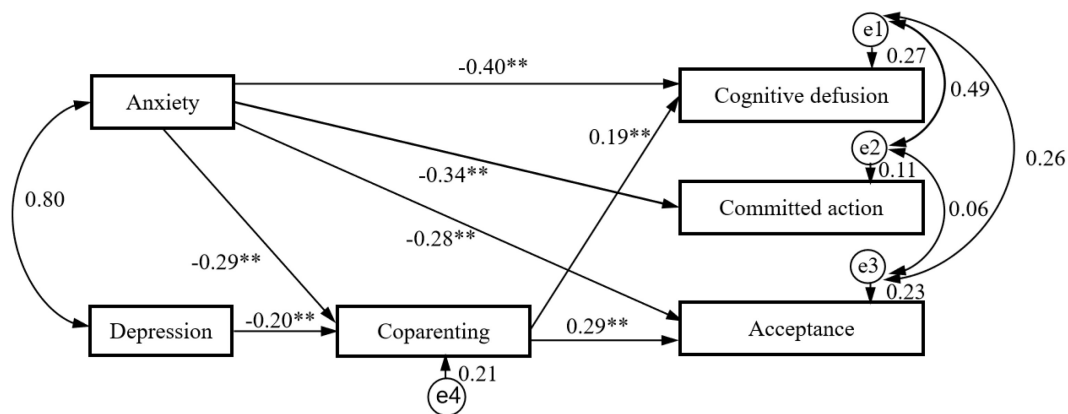


FIGURE 1 | Results of mediation path analysis showing the relationships between anxiety, depression, and parental psychological flexibility with coparenting as a mediator. ** $P < 0.01$.

Moderation Analyses

According to SEM analysis results, anxiety, rather than depression, negatively predicted cognitive defusion, committed action, and acceptance. Therefore, we performed hierarchical linear regressions to test the moderating role of coparenting in the relationship between anxiety and PPF (cognitive defusion, committed action, and acceptance, respectively). All continuous variables were centered. Cognitive defusion was included in the regression model as the dependent variable, while covariates (age, gender, number of children, and education level) were entered into the regression model firstly. Anxiety, depression, and coparenting were included in the model subsequently. Interaction term of anxiety \times coparenting was included finally. **Table 5** presents the results of hierarchical regression. In line with the findings of mediating analysis, these results showed that anxiety and coparenting, rather than depression, significantly predicted cognitive defusion. There was a significant anxiety \times coparenting interaction ($\beta = -0.40$, $t = -3.34$, $P < 0.01$), suggesting that coparenting moderated the association between anxiety and cognitive defusion. Same procedures were carried out for committed action and acceptance. Results for acceptance also revealed that there were significant main effects of anxiety and coparenting, rather than depression. Similarly,

the anxiety \times coparenting interaction significantly predicted acceptance ($\beta = -0.32$, $t = -2.56$, $P < 0.05$), suggesting that coparenting moderated the relationship between anxiety and acceptance. However, coparenting did not moderate the relationship between anxiety and committed action ($\beta = -0.20$, $t = -1.49$, $P > 0.05$).

According to Holmbeck's suggestion (Holmbeck, 2002), we calculated the simple slopes at 1 SD above (>71.17) and below (<42.59) the mean coparenting level to test the impact of the anxiety \times coparenting interaction on cognitive defusion, and the impact of the anxiety \times coparenting interaction on acceptance. When coparenting reported by parents was low, the link between anxiety and cognitive defusion was stronger ($\beta = -0.56$, $t = -5.30$, $P < 0.01$) as compared to the case when coparenting was high ($\beta = -0.45$, $t = -4.31$, $P < 0.01$). **Figure 2A** showed that the link between anxiety and cognitive defusion was more stronger for parents who had poorer coparenting quality compared with those reporting better coparenting quality. **Figure 2B** revealed that the link between anxiety and acceptance was more significant ($\beta = -0.24$, $t = -2.13$, $P = 0.03 < 0.05$) for participants who had poorer coparenting quality, while the link between anxiety and acceptance was not significant for parents reporting higher levels of coparenting ($\beta = -0.17$, $t = -1.51$, $P = 0.14 > 0.05$). These findings partially supported the hypothesis H5 that coparenting moderates the relationship between anxiety, depression, and PPF.

TABLE 4 | Bootstrapping indirect effects and 95% confidence intervals (CI) for the final mediational model.

Model pathways	Point estimates	95% CI	
		Lower	Upper
Anxiety \rightarrow Coparenting	-0.12	-0.19	-0.06
\rightarrow Cognitive defusion			
Anxiety \rightarrow Coparenting	-0.11	-0.16	-0.06
\rightarrow Acceptance			
Depression \rightarrow Coparenting	-0.08	-0.13	-0.03
\rightarrow Cognitive defusion			
Depression \rightarrow Coparenting	-0.07	-0.12	-0.02
\rightarrow Acceptance			

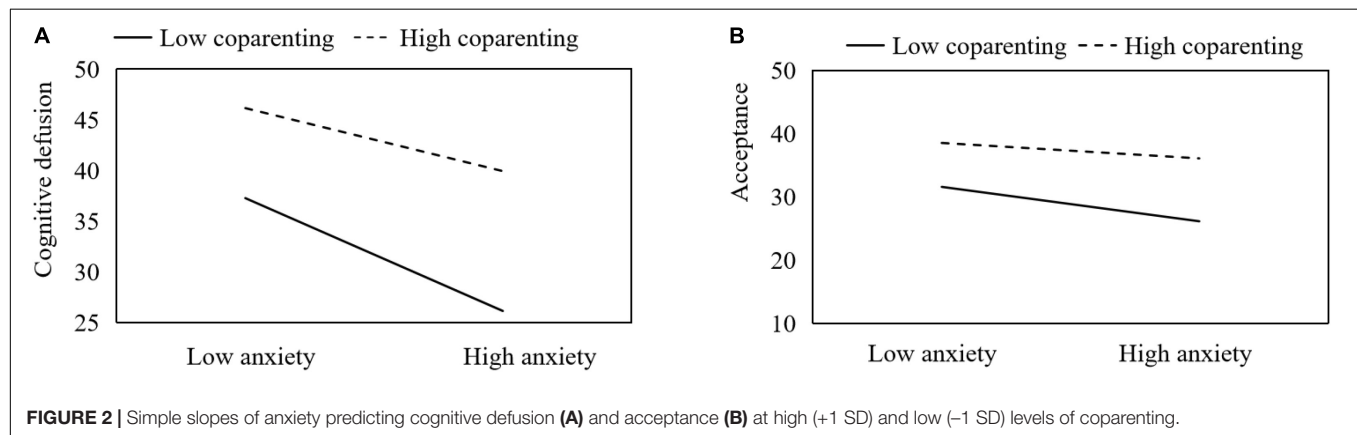
DISCUSSION

The results suggested that total scores of PPF in this sample were lower than those in a previous study based on 1,075 parents of primary children (88.66 ± 18.00 vs. 96.80 ± 15.60 , $t = -9.72$, $P < 0.01$; Li et al., 2018). This revealed that the protective and risk factors of PPF should be explored in order to develop psychological intervention measures for the sake of facilitating their PPF. In line with previous studies (Li et al., 2018; Li, 2019), the educational level had a significant impact on PPF. In particular, parents with education level less than high

TABLE 5 | The regression models for cognitive defusion and acceptance (beta, standardized regression coefficient).

		Cognitive defusion	Committed action	Acceptance
Step 1	Age	-0.03	0.02	-0.02
	Gender	-0.07	0.02	-0.05
	Number of children	0.01	-0.01	-0.01
	Education level	0.22**	0.24**	0.13*
Step 2	Age	-0.04	<0.01	-0.01
	Gender	-0.08*	<0.01	-0.05
	Number of children	-0.03	-0.03	-0.05
	Education level	0.15**	0.19**	0.06
	Anxiety	-0.37**	-0.29**	-0.21**
	Depression	-0.05	-0.06	-0.09
	Coparenting	0.16**	-0.04	0.27**
Step 3	Age	-0.05	-0.01	-0.03
	Gender	-0.08	0.01	-0.05
	Number of children	-0.04	-0.03	-0.05
	Education level	0.14**	0.19**	0.05
	Anxiety	0.08	-0.07	0.15
	Depression	-0.08	-0.08	-0.12
	Coparenting	0.32**	0.04	0.40**
	Anxiety × coparenting	-0.40**	-0.20	-0.32*
	Step 1	$F = 7.188; P < 0.001; R_1^2 = 0.243$	$F = 6.823; P < 0.001; R_1^2 = 0.056$	$F = 2.529; P = 0.040; R_1^2 = 0.147$
	Step 2	$F = 28.290; P < 0.001; R_2^2 = 0.551$	$F = 11.977; P < 0.001; R_2^2 = 0.156$	$F = 21.051; P < 0.001; R_2^2 = 0.495$
	Step 3	$F = 26.702; P < 0.001; R_3^2 = 0.566$	$F = 10.787; P < 0.001; R_3^2 = 0.160$	$F = 18.465; P < 0.001; R_3^2 = 0.506$
	ΔR^2 (Step 3 - Step 2)	0.015	0.004	0.011

Note $n = 462$; * $P < 0.05$; ** $P < 0.01$.



school had the lowest level of PPF, while those who had master's degrees or above reported the highest level of PPF. No significant difference was found between another two groups. The possible explanation underlying this phenomenon is that the education level of parents may act as a proxy for other factors such as family income, social status, coping style, etc. (Bluth et al., 2020). The reason behind this phenomenon may be that parents of toddlers and preschool children faced relatively simple parenting matters, so they reported a higher level of self-perceived PPF. With the growth of children, the problems in parenting increased. Parents should not only take care of children's daily life, but also teach their children how to get along with others, how to take social responsibility, how to cope with academic pressure and competitive environment (Quach et al., 2015). Therefore,

they reported a lower level of self-perceived PPF. It requires our more attention in order to improve the PPF of parents of school-age children.

Our findings clearly supported the hypothesis that anxiety and depression are negatively associated with PPF. In agreement with previous studies (Moyer and Sandoz, 2015; Sairanen et al., 2018), emotional distress, such as anxiety and depression, increased the risk for psychological inflexibility in the context of parenting. Results of SEM showed that anxiety exhibited direct impacts on three factors of PPF and indirect impacts on cognitive defusion and acceptance through coparenting. It further confirmed that parents' anxiety may hinder the development of their adaptive parenting skills, thereby leading to: "anxiety-enhancing" parental behaviors, such as denial

and rejection (Ginsburg and Schlossberg, 2002; Hudson and Rapee, 2002), which reflects the core characteristics of parental psychological inflexibility. By contrast, depression only had indirect impacts on cognitive defusion and acceptance via coparenting. As mentioned by Včver et al. (2015), parents in depression state do not pay enough attention to children's psychological needs and feelings, and rarely carry out continuous social interaction with their children. This phenomenon may be due to the fact that parents' depression symptoms are often accompanied by cognitive impairments (Pettersen and Albers, 2001), which in turn, contribute to less responsive and less positive parenting behaviors toward their children (Kim-Cohen et al., 2005). However, these withdrawal behaviors cannot be well captured in the PPFQ. Accordingly, it is understandable that anxiety exhibited a stronger negative impact on PPF than depression in this study. What's even more concerning, as proposed by previous studies (Majdandžić et al., 2012; Metz et al., 2018b; Williams, 2018), anxiety and depression symptoms play a role in the undermining coparenting behavior of parents. The possible explanation might be that anxiety and depression lead to more couple conflicts, inconsistent parenting, and unreasonable division of labor (Lamela et al., 2016), thereby resulting in poor coparenting quality.

This study also sought to examine the impact of coparenting quality on PPF, as well as its mediating and moderating roles. As expected, it was found that coparenting quality significantly predicted cognitive defusion and acceptance, rather than committed action, which indicated that coparenting could help parents avoid passivity, severity and boredom, increase the possibility of perceiving and strengthening children's positive behaviors, and make parents' behaviors consistent with their parenting values. The results actually explained the finding that the support and coordination between couples can promote family function, therefore they tend to adopt more effective parental strategies (Sotomayor-Peterson et al., 2013). Moreover, the moderation model showed that better coparenting quality moderated the negative impact of anxiety on cognitive defusion and acceptance. That is, relative to parents with poorer coparenting quality, those who had better coparenting quality were more likely to accept children's and their own psychological distress and thoughts and less likely to be disturbed by anxiety. This study shed light on the associations of anxiety, depression, coparenting quality, and PPF. Our results revealed the fact that coparenting acts as a protective factor for alleviating the impact of parental anxiety on PPF. These findings supported the process model (Belsky, 1984) and the family systems theory (Cox and Paley, 2003) by suggesting that PPF is multiply determined and individual mental health and parenting support and interaction between husband and wife can affect parenting quality.

Nevertheless, several shortcomings of this study should be noted. Firstly, the cross-sectional design limited its ability to infer the causal relationship between anxiety, depression, coparenting, and PPF. Besides that, the moderating and mediating roles of the same construct were tested simultaneously in this study. Although this method is often used by other researchers (Hayes, 2013; Güngr and Uman, 2020). Karazsia and Berlin (2018) proposed a more robust model and pointed out that a

variable can serve as both a mediator and a moderator, but at different time points within the same model. Therefore, a longitudinal study should be carried out in the future in order to accurately capture the role of coparenting between psychological distress and PPF. Secondly, the application of self-reported measures affected the objectivity of this study to a certain extent. Some other assessment methods (e.g., peer-reports and objective outcomes) should be used to avoid the possible effects of social expectations. Finally, we failed to collect some demographic information such as family income, parental stress, children's internalizing and externalizing behaviors which may be related to PPF.

Despite these limitations, current findings demonstrated that psychological distress, especially anxiety, had significant and negative impacts on parental flexibility. In addition, coparenting played a vital role between psychological distress and PPF. On the one hand, anxiety and depression can affect PPF by lessening the quality of coparenting. On the other hand, good coparenting quality can alleviate the impact of anxiety on PPF. These findings have significant implications for parental practice and research by suggesting that coparenting may serve as a potential intervention target for enhancing PPF. Our results also suggested that parents with low educational background and parents of school-age children should be investigated deeply in future studies. Regarding parents with low education background, social support and positive empowerment may be important ways to improve their parental flexibility. More attention should be paid to the parenting pressure faced by this vulnerable group, so as to formulate targeted solutions.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Ethics Committee of Sichuan International Studies University. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

YY conceived and designed the investigation, analyzed the data, and wrote the article. YX collected the data and revised the manuscript. Both authors contributed to the article and approved the submitted version.

FUNDING

This research was supported by Social Science Planning Project of Chongqing (No. 2020YBSH107).

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Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Coparenting and Parental Involvement During School Transition Among Chinese Mothers and Fathers: Children's School Liking as a Moderator

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OPEN ACCESS

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Specialty section:

This article was submitted to
Gender, Sex and Sexualities,
a section of the journal
Frontiers in Psychology

Received: 03 September 2021

Accepted: 08 November 2021

Published: 29 November 2021

Citation:

Tao S and Lau EYH (2021)
Coparenting and Parental
Involvement During School
Transition Among Chinese Mothers
and Fathers: Children's School
Liking as a Moderator.
Front. Psychol. 12:769416.
doi: 10.3389/fpsyg.2021.769416

Parental involvement is a vital social resource that helps children to deal with different challenges in their learning and development in the transition period and may be a strong determinant of children's outcomes. While the role of fathers has been increasingly recognized, there has been a lack of studies examining the predictive role of mother and fathers' coparenting to parental involvement and child readiness outcomes. The purpose of this study is to examine the longitudinal association between coparenting behavior and parental involvement for parents with children in the transition to primary school in a Chinese context, and test whether children's school liking moderated these associations. Using stratified random sampling, 324 children ($M_{\text{age}} = 70.57$ months, female = 51%) and their parents from 10 kindergartens in Hong Kong participated in the study. Both mothers and fathers provided information about their spouse's coparenting behavior at Time 1 (the final year of kindergarten), and their parental involvement at home and school at Time 1 and 2 (the first year of primary school). Children's school liking was assessed by puppet interview at Time 1. Results indicated that maternal cooperation was positively associated with paternal involvement at home and in school, and paternal cooperation was positively associated with maternal involvement at home. Children's school liking moderated the longitudinal associations between coparenting behavior (Time 1) and parental involvement (Time 2). Specifically, mothers of children with high levels of school liking were involved more in school when they perceived more cooperation from the spouse. Fathers of children with low levels of school liking were less involved in school when they perceived more cooperation, while involved more at home and in school when they perceived more triangulation from the spouse. Additionally, fathers perceiving more triangulation decreased their home involvement when the child reported high levels of school liking. Findings of this study revealed that coparenting, children's school liking, and parental gender might be important to understanding parental involvement during school transition.

Keywords: coparenting, parental involvement, school liking, Chinese parents, school transition

INTRODUCTION

Parental involvement is defined as a multi-faceted concept that includes a wide range of parental practices that take place both at home and in school to aid the development of children (Epstein, 1995; Fan and Chen, 2001). According to social support theory, parental involvement is a vital social resource that helps children deal with different challenges in their development process and may be a strong determinant of children's outcomes (Cohen and Wills, 1985). Although individual level (e.g., parents' education level) and school level factors (e.g., teacher invitations) were found to predict parental involvement, less is known about how family-level factors such as coparenting influence parental involvement during the transition to primary school. The goal of this study is to examine the longitudinal relations between coparenting and parental involvement in school transition and to analyze children's school liking as moderator in these relations.

Parental Involvement During School Transition

Transition to primary school represents a major challenge for young children (Conn-Powers et al., 1990). Parental involvement is considered to be crucial in helping children cope with different challenges in their school transition (Fan and Chen, 2001). When parents and teachers collaborate to support children, children are more likely to experience a successful school transition and show enhanced school adjustment, generally defined in terms of academic performance (e.g., language and cognitive skills) and school engagement (e.g., school liking; Birch and Ladd, 1997). The positive influence of parental involvement, such as co-reading at home and parental communication with the school has been confirmed as they collectively enhance parent-child relationships and improve children's school readiness (Li and Rao, 2000; Boonk et al., 2018).

Generally, examples of parental involvement at home include having conversations and collaborating in learning and leisure activities with children, whereas examples of parental involvement in school include communicating with teachers and participating in school events (Epstein, 1995; Fan and Chen, 2001). To better conceptualize parental involvement during the transition to primary school in the Chinese context, Lau et al. (2011) specified home involvement into four subdimensions, including parent instruction (activities that promote children's self-care and social and emotional skills), parent discussion (discussion of issues related to school), language and cognitive activities (home learning activities that aid children's language and cognitive skills), and homework involvement (supervision of and assistance with children's completion of homework). The school involvement was conceptualized into two subdimensions, including home-school conferencing (parents' school-based involvement in communicating with the school) and school involvement (participation in various school activities to assist the schools' functioning). Both home and school involvement was found to have a positive influence on children's school readiness (for a review, see Boonk et al., 2018). As such, it is important to explore factors that predict parental involvement,

particularly during the critical transition from kindergarten to primary school.

Coparenting and Parental Involvement

Coparenting is defined as the way parents coordinate their shared responsibility to rear the child (McHale et al., 2002). Although the conceptualization of coparenting differs in previous theoretical reviews and empirical studies (Margolin et al., 2001; Feinberg, 2003), supportive coparenting and conflicted coparenting are among the most widely used operationalizations of coparenting in studies of parent-child relationships. Supportive coparenting describes how parents value and respect each other through cooperation; while conflicted coparenting refers to how parents intrude upon or exclude the other parent through triangulation and conflict. According to Family Systems theory, both supportive and conflicted coparenting are closely associated with parental involvement and subsequent child outcomes. Specifically, family is a social system with members interdependently influencing each other and developing behavior patterns that are maintained over time (Minuchin, 1985). The mood, or behaviors from one subsystem, e.g., co-parenting, can be transferred to another, e.g., parental involvement to the child (Erel and Burman, 1995). The spillover hypothesis suggests that a couple's interaction may spill over into parent-child interactions through parents' moods or behaviors (Krishnakumar and Buehler, 2000). Parents' conflict of their shared parenting responsibility (i.e., conflicted coparenting) may thus be transferred to parent-child interaction and decreases their parental involvement. Alternatively, the compensatory hypothesis proposes that parental relationship problems may lead to more attention, dedication, and investment from parents toward their child (Kouros et al., 2014). This hypothesis would predict higher levels of parental involvement among couples with low supportive coparenting, given that parents are motivated to invest more time in the parent-child relationship to achieve any unmet needs of love and support in the mother-father relationship.

To date, empirical studies have mostly documented the evidence of the spillover hypothesis but there has been little evidence to support compensatory effects (Hammer et al., 2005; Nelson et al., 2009). For example, consistent with the spillover hypothesis, higher levels of supportive coparenting were associated with higher levels involvement for both mothers and fathers (Schoppe-Sullivan et al., 2008; Hohmann-Marriott, 2011; Berryhill, 2017). Conflicted coparenting was negatively associated with paternal involvement in caregiving and play (Buckley and Schoppe-Sullivan, 2010; Jia and Schoppe-Sullivan, 2011). Although studies demonstrate the associations of coparenting with parental involvement, the results vary depending on which aspects of parental involvement were investigated. It has been suggested to pay special attention to the different dimensions of parental involvement and that they be measured separately (Fan and Chen, 2001). However, research on parental involvement has been fragmented, addressing a range of variables, mostly home-based involvement such as play and caregiving (Buckley and Schoppe-Sullivan, 2010; Jia and Schoppe-Sullivan, 2011) and physical care and cognitive stimulation (Fagan and Cabrera, 2012). More studies using the multidimensional

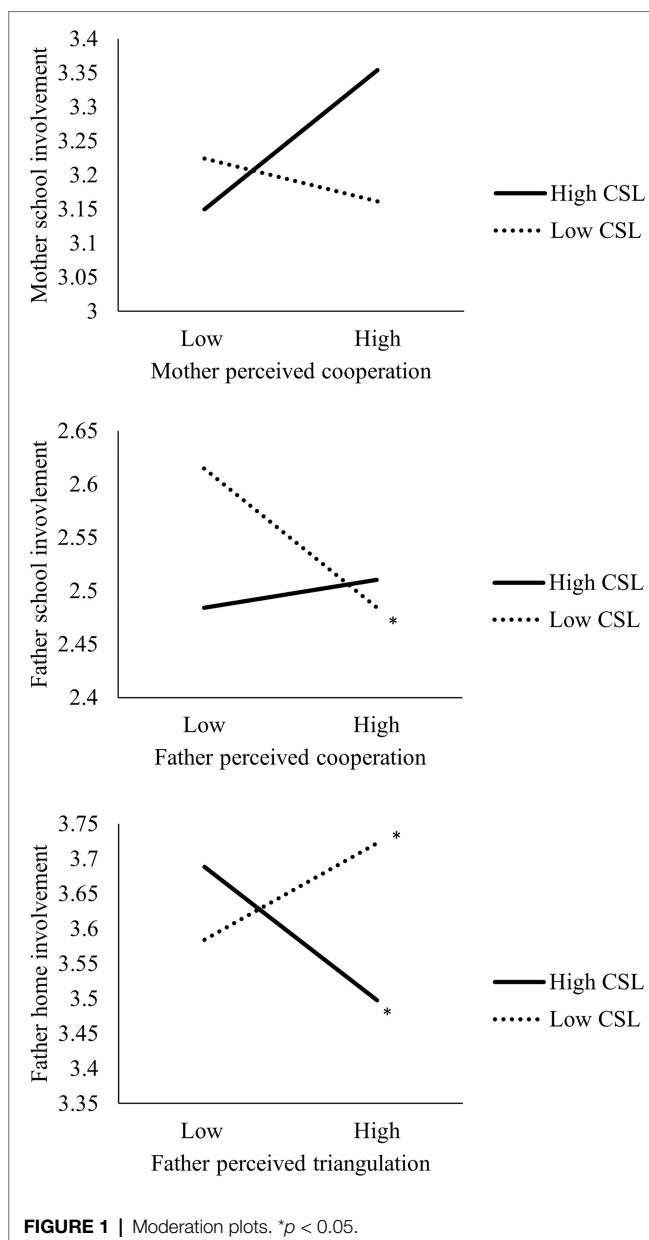
framework of parental involvement (i.e., both at home and in school) are warranted. Additionally, given the cross-sectional nature of most of the above-mentioned studies (e.g., Hohmann-Marriott, 2011), longitudinal investigation addressing the causal effects of coparenting and parental involvement is needed.

Child School Liking as Moderator

Since the family is a social system with members interdependently influencing each other over time (Minuchin, 1985), children's characteristics during school transition, e.g., children's school liking, may have an impact to the relations of coparenting and parental involvement. A successful transition to school includes academic performance, i.e., language and early math, as well as emotional adjustment, i.e., school liking (Buhs and Ladd, 2001). School liking, defined as the extent to which children profess to like or dislike school (Ladd et al., 1996), is positively associated with young children's school performance, including behavioral engagement, e.g., cooperative classroom behavior, and achievement, e.g., cognitive skills (Ladd et al., 2000). When children exhibit low levels of school liking, parents may increase their involvement at home and in school to assist their children's adjustment (Tao et al., 2019). Given that supportive coparenting is positively associated with parental involvement, parents of children with low levels of school liking may exhibit more parental involvement than those of children with high levels of school liking, because they want to support their children's adjustment. Similarly, children's school liking may buffer the negatively association between conflicted coparenting and parental involvement. **Figure 1** displays the moderation plot. Parents of children with low levels of school liking may increase their involvement when the level of conflicted coparenting is high. However, such moderating effects have not been examined.

Gender Difference and Chinese Context

Mothers' and fathers' differential gendered role within the context of coparenting is likely to influence their parental involvement. Specifically, the link between supportive coparenting and home-based involvement was found to be significantly stronger for mothers, and the link between supportive coparenting and school-based involvement was significantly stronger for fathers (Berryhill, 2017). The underlying mechanism may line up with the gender distinctions of specific aspects of family life (Allen and Hawkins, 1999). As mothers typically adopt the cultural norm of maintaining the home and involved more in childcare tasks, increased coparenting support may reinforce mothers' cultural identity and the role they play as the center of care in family life, and this in turn may extend to greater levels of home involvement (Shumow and Lomax, 2002). By contrast, father involvement is highly influenced by ecological forces such as coparenting dynamics (Varga et al., 2014; Lau and Power, 2018), and fathers are generally less involved in school events than mothers (Tan and Goldberg, 2009). Fathers, therefore, may rely more on the guidance and support from mothers, i.e., coparenting, to communicate and coordinate the child's school activities. Finding of these studies suggests that



both parents should be involved in coparenting and parental involvement study to understand the gendered influence on these relations.

The associations among coparenting, child school liking, and parental involvement may vary across cultures, as parents from different countries may value children's school liking differently (Seginer and Vermulst, 2002). In China, children's school liking may strongly influence parental involvement because Chinese parents have long been identified as having high expectations for children's academic achievement and be comparatively highly involved in school transition (Chan, 2010; Cheung and Pomerantz, 2011; Lau, 2014). Now, traditional gendered parenting roles, such as the caregiving mother and the working father, are slowly breaking down (Liu et al., 2016). At the same time, contemporary Chinese fathers are eager to

support their children's development (Lau, 2016). With these two facts in mind, we will investigate the associations between coparenting experiences and parental involvement during school transitions in a Chinese context and examine how children's school liking moderates such associations.

This Study

The longitudinal relation between coparenting and parental involvement, and the role of children's school liking in moderating this relation, has not been fully explored. Given that theoretical reviews and empirical studies differ in their underlying conceptualizations of coparenting (e.g., Margolin et al., 2001; Feinberg, 2003), *cooperation* (i.e., the extent parents support and respect each other as parents) was adopted in this study as the major construct of supportive coparenting as it is widely used in previous studies (e.g., Lau and Power, 2019), and *triangulation* (i.e., parents involve the child in parental conflict) were adopted as the major construct of conflicted coparenting because it is more related to parent-child relations. The purpose of this study was to examine the longitudinal associations between coparenting experience and parental involvement in transition to primary school, and the moderation role of children's school liking in a Chinese context. Based on the spill over hypothesis, we hypothesized that:

1. Cooperation would be positively associated with parental involvement. Triangulation would be negatively associated with parental involvement.
2. The positive association between cooperation and parental involvement would be more robust for parents of children with low levels of school liking.
3. The negative association between triangulation and parental involvement would be buffered by children's low levels of school liking.

MATERIALS AND METHODS

Sample

Stratified random sampling was used to recruit 10 kindergartens in each of the three strata (i.e., high, middle, and low income) developed based on the median monthly household incomes of the districts (Hong Kong Census and Statistics Department, 2012). Invitation letters were sent to kindergartens, and phone calls were made to the principals. Ten kindergartens agreed to participate in the study: three from the high-income stratum, four from the middle-income stratum, and three from low-income stratum. Parents of 324 of 621 children consented to participate. At T1, children-female = 51% were 70.57 months old on average, with an $SD = 3.70$ months. The median age range of mothers and fathers was 31–40 years, and the median education level for both mothers and fathers was secondary education. The median range of monthly household income was HK\$30,001–40,000 (US\$ 3,861–5,148), similar to the median monthly household income of Hong Kong families of HK\$24,890 (Hong Kong Census and Statistics Department, 2012). At T2, parents of 252 children (female = 52%) completed the study. Attrition

rates (22.2%) were considered acceptable due to difficulty retaining families when children changed schools. One-way ANOVA showed that families who dropped out had significantly lower mother and father education levels and lower levels of father-reported maternal cooperation.

Procedure

A two-wave longitudinal design was adopted in this study. Time 1 (T1) data were collected in the final year of kindergarten and Time 2 (T2) data were collected in the first year of primary school. The interval between two-time points was 10 months. Parents completed questionnaires and received tokens of appreciation for their participation at each time point. They reported the spouse's coparenting behavior at T1, and their own parental involvement at T1 and T2. Children's school liking was measured by puppet interview in the kindergarten at T1.

Measurements

Coparenting experience was measured by using two of the three subscales of the Coparenting Questionnaire developed by Margolin et al., 2001. The cooperation subscale includes five items such as "My spouse tells me lots of things about this child." The triangulation subscale includes four items such as "My spouse uses this child to get back at me." Parents rated their spouse's coparenting behavior on a five-point Likert scale with 1 = never, 5 = always. Higher scores mean higher levels of perceived cooperation/triangulation from the spouse. These subscales have been shown to be reliable in previous Chinese samples (Lau, 2017) and in this study (α ranged from 0.73 to 0.86 for mothers and fathers).

Parental involvement behavior was assessed using the 26-item Chinese Early Parental Involvement Scale (CEPIS) developed by Lau et al. (2011). The CEPIS includes two dimensions and six subdimensions that capture the multidimensional nature of Chinese parental involvement during the early childhood years (Home involvement: parent instruction, parent discussion, language and cognitive activities, and homework involvement; School involvement: home-school conferencing and preschool/school involvement). Parents rated their involvement on a five-point Likert scale (1 = highly inaccurate; 5 = highly accurate). The score of home and school involvement was computed by averaging the raw score of each dimension's items. A higher score means higher levels of involvement. These subscales have been shown to be reliable in previous Chinese samples (Lau and Power, 2018) and in this study (α ranged from 0.78 to 0.91 for mothers and fathers).

Children's school liking was measured using puppet interviews in their kindergarten. The six school liking items, such as "Are you happy when you are at school?," were derived from the School Liking and Avoidance Questionnaire (Ladd and Price, 1987). In the interview, two opposite statements were presented by two identical hand puppets. One puppet says, "I am happy when I am at school," another then says "I am not happy when I am at school." Children were asked which puppet was most like them and indicate whether they were "very much alike" or only "slightly alike." The response was recorded on a four-point scale, from 1 = very much alike the negative

statement to 4 = very much alike the positive statement. Higher scores mean higher levels of school liking. The scale has been shown to be reliable in the present study ($\alpha = 0.83$).

Analytic Plan

Data analysis was conducted using SPSS AMOS, version 23 (Arbuckle, 2017). Missing data were handled by using the Full Information Maximizing-Likelihood (FIML) method. Preliminary analyses were conducted to determine the descriptive characteristics and correlations among measured variables across time points. Path analysis models were applied to examine the moderation effect of children's school liking on the longitudinal associations between coparenting experience and parental involvement. T1 coparenting experience, i.e., cooperation and triangulation, T1 children's school liking, and the interactional variables of coparenting experience and children's school liking were set as independent variables (IV). T2 parental involvement, i.e., home and school involvement, was set as dependent variable (DV), controlled by T1 parental involvement. The analyses were conducted separately for mothers and fathers. To avoid multicollinearity, all IVs constituting interaction terms were centered (Aiken, 1991). Model fit was assessed using the chi square statistic/df (< 3.0), the CFI (≥ 0.95), and the RMSEA (≤ 0.08 ; Hooper et al., 2008). Moderation effect was determined by the significant level of the interactional terms less than 0.05. If a significant interactional effect was detected, a simple slope test was conducted using SPSS PROCESS (Hayes, 2012).

RESULTS

Table 1 shows the valid cases (N), means (M), SD, and correlations among the measured variables at both time points. For all the measured variables, skewness was less than 3, and kurtosis was less than 8, indicating that the non-normality of the data was not a problem. Correlation analyses showed that maternal cooperation at T1 was positively associated with paternal involvement at home and school at T2, while paternal cooperation at T1 was positively associated with maternal involvement at home at T2. Maternal and paternal triangulation at T1 was not associated with spousal parental involvement at T2.

The model fit for all path models was satisfactory [all chi square statistic/df (< 3.0), the CFI (≥ 0.95), and the RMSEA (≤ 0.08)]. **Table 2** displays the moderating effects of children's school liking on coparenting and parental involvement. In the mother model, the interaction between cooperation and children's school liking was significant for subsequent school involvement ($B = -0.08$, $p = 0.049$) but not for home involvement ($B = -0.04$, $p = 0.11$). A simple slope test revealed that the positive association between perceived cooperation and school involvement was only significant for mothers of children with high levels of school liking (i.e., 1 SD above the mean, $p < 0.05$). This implies that children's school liking significantly moderated the relations between mother perceived cooperation and school involvement. Mothers of children with high levels of school liking were involved more in school at T2 when they perceived more cooperation from the spouse at T1.

For fathers, the interaction between cooperation and children's school liking was significant for subsequent school involvement ($B = -0.11$, $p = 0.02$) but not for home involvement ($B = -0.03$, $p = 0.37$). A simple slope test revealed that the negative association between father perceived cooperation and school involvement was only significant for fathers of children with low levels of school liking (i.e., 1 SD below the mean, $p < 0.05$). Further, the interaction between triangulation and children's school liking was significant for both subsequent home involvement ($B = 0.13$, $p < 0.001$) and school involvement ($B = 0.12$, $p = 0.002$). Specifically, the positive association between father-perceived triangulation and school involvement was only significant for fathers of children with low school liking ($p < 0.05$). Fathers of children with high levels of school liking decreased their home involvement when they perceived more triangulation ($p < 0.05$), while fathers of children with low levels of school liking increased their home involvement when they perceived more triangulation ($p < 0.05$).

DISCUSSION

This study investigated the longitudinal associations between coparenting experience and parental involvement during the transition to primary school in a Chinese context, and the moderation role of children's school liking in kindergarten in these associations. Partially consistent with the hypothesis, maternal cooperation was positively associated with paternal involvement at home and in school, and paternal cooperation was positively associated with maternal involvement at home. Children's school liking in kindergarten moderated the longitudinal associations between coparenting experience and parental involvement. When perceived more cooperation, mothers of children with high levels of school liking became more involved in school, while fathers of children with low levels of school liking were less involved in school at T2. When perceived more triangulation, fathers of children with high levels of school liking became less involved at home, and fathers of children with low levels of school liking involved more at home and school at T2.

Consistent with previous studies, higher levels of cooperation were associated with higher levels involvement for both mothers and fathers (e.g., Schoppe-Sullivan et al., 2008; Hohmann-Marriott, 2011; Berryhill, 2017). Extending the results of previous literature that measured only one aspect of/a general parental involvement, results of this study suggest that supportive spousal coparenting longitudinally predicted maternal involvement at home and paternal involvement at home and in school. A possible explanation is that mothers are generally more involved at home and that spouse's supportive coparenting reinforces their role as the center of care in family life (Shumow and Lomax, 2002). Since fathers are generally less involved than mothers (Tan and Goldberg, 2009), supportive coparenting by mothers might encourage their involvement both at home and in school. In contrast, triangulation was not associated with subsequent parental involvement, which is at odds with previous study

TABLE 1 | Valid cases (*N*), means (*M*), SD, and correlations among key variables.

	<i>N</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13
1. M cooperation (T1)	311	3.23	0.81	-												
2. M triangulation (T1)	311	1.31	0.45	-0.21**	-											
3. F cooperation (T1)	306	3.80	0.71	0.37**	-0.22**	-										
4. F triangulation (T1)	306	1.50	0.67	-0.19**	0.41**	-0.20**	-									
5. M school involvement (T1)	319	3.05	0.77	0.17**	0.03	0.21**	0.05	-								
6. M home involvement (T1)	319	3.97	0.52	0.32**	-0.16**	0.29**	-0.06	0.60**	-							
7. M school involvement (T2)	237	3.21	0.67	0.13	0.06	0.12	-0.03	0.54**	0.29**	-						
8. M home involvement (T2)	237	4.05	0.48	0.27**	-0.14**	0.24**	-0.06	0.41**	0.63**	0.50**	-					
9. F school involvement (T1)	308	2.33	0.82	0.24**	-0.03	0.17**	-0.03	0.19**	0.09	0.00	0.06	-				
10. F home involvement (T1)	308	3.50	0.58	0.47**	-0.11	0.36**	0.02	0.19**	0.25**	-0.02	0.12	0.62**	-			
11. F school involvement (T2)	209	2.47	0.81	0.22**	-0.02	-0.00	-0.04	0.09	0.04	0.13	0.14**	0.50**	0.39**	-		
12. F home involvement (T2)	209	3.62	0.54	0.33**	-0.12	0.20**	0.01	0.02	0.05	0.12	0.20**	0.28**	0.47**	0.49**	-	
13. Child School liking (T1)	324	3.69	0.43	0.06	-0.16**	0.10	-0.03	0.07	0.07	0.01	0.08	0.01	0.02	-0.05	0.01	-

M, mother; *F*, father; *T1*, time 1; and *T2*, time 2.

** $p < 0.01$.

TABLE 2 | The moderating effects of children's school liking on coparenting and parental involvement.

	DV = M home involvement (T2)			DV = M school involvement (T2)		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Cooperation	0.06	0.03	0.07	0.04	0.05	0.43
Child school liking	0.03	0.06	0.60	−0.08	0.10	0.38
Cooperation * Child school liking	−0.04	0.02	0.11	−0.08	0.04	0.049
M home involvement (T1)	0.63	0.05	<0.001	-	-	-
M school involvement (T1)	-	-	-	0.50	0.05	<0.001
M education	0.04	0.02	0.03	0.02	0.03	0.51
Family income	−0.01	0.02	0.80	−0.07	0.05	0.02
Triangulation	−0.08	0.05	0.14	0.06	0.09	0.50
Child school liking	0.02	0.06	0.78	−0.05	0.10	0.61
Triangulation * Child school liking	0.02	0.02	0.27	0.01	0.03	0.68
M home involvement (T1)	0.65	0.04	<0.001	-	-	-
M school involvement (T1)	-	-	-	0.50	0.05	<0.001
M education	0.05	0.02	0.04	0.02	0.03	0.55
Family income	−0.00	0.02	0.83	−0.07	0.03	0.02
	DV = F home involvement (T2)			DV = F school involvement (T2)		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Cooperation	0.07	0.05	0.19	−0.08	0.07	0.25
Child school liking	0.01	0.08	0.88	0.00	0.12	0.99
Cooperation * Child school liking	−0.03	0.03	0.37	−0.11	0.05	0.02
F home involvement (T1)	0.46	0.06	<0.001	-	-	-
F school involvement (T1)	-	-	-	0.47	0.06	<0.001
F education	0.03	0.03	0.21	0.05	0.04	0.22
Family income	0.00	0.03	0.93	−0.01	0.04	0.85
Triangulation	−0.01	0.05	0.78	−0.05	0.08	0.54
Child school liking	0.06	0.08	0.42	0.02	0.12	0.86
Triangulation * Child school liking	0.13	0.03	<0.001	0.12	0.04	0.002
F home involvement (T1)	0.48	0.06	<0.001	-	-	-
F school involvement (T1)	-	-	-	0.47	0.06	<0.001
F education	0.03	0.03	0.21	0.05	0.04	0.25
Family income	0.00	0.03	0.93	−0.01	0.04	0.90

M, mother; F, father; T1, time 1; and T2, time 2.

(Buckley and Schoppe-Sullivan, 2010; Jia and Schoppe-Sullivan, 2011). The discrepancy may be due to a comparatively narrow definition of “parental involvement” (i.e., in caregiving and play) in previous study. Considering a broader range of parental involvement (incl. at home and in school) may result in a different link with coparenting.

When perceived more cooperation, mothers of children with high levels of school liking showed more involvement in school, which are not consistent with our hypothesis. This may imply that children's school liking is a significant moderator for cooperation and maternal school involvement. When mothers perceived more cooperation, their confidence in communicating with and participating in the school may be further strengthened by the child's high levels of school liking. Children's school liking was not a moderator in the positive associations between cooperation and maternal home involvement. A plausible explanation is that Chinese mothers were found to perform their mothering role at home regardless of the stressors they experience (Kwan et al., 2015). Therefore, the quality of maternal involvement at home may be less susceptible to the stressors such as children's school liking (Lau and Power, 2018).

Regarding fathers, those of children with low levels of school liking exhibited less school involvement when they perceived more cooperation from mothers, which is inconsistent with the hypothesis. This may be because fathers no longer feel

they need to be involved as they can rely on the child's mother when they perceive more cooperation, and low school-liking children are less likely to invite their parents to join school activities (Overstreet et al., 2005; Freund et al., 2018). Consistent with the hypothesis and compensation theory, fathers who perceived more triangulations were more involved at home and in school when their children showed low levels of school liking. A possible explanation is that Chinese fathers were found to rely on mothers' support but at the same time, were eager to be highly involved in family affairs (Lau and Power, 2018). When mothers did not cooperate with them (i.e., high triangulation), fathers became more involved both at home and in school to support their children to have a better transition experience. Consistent with the spillover theory and our hypothesis, fathers of children with high levels of school liking showed decreased involvement at home when they perceived more triangulation, perhaps because fathers transfer the negative affect from spousal subsystem to parent-child subsystem and feel fine to decrease their home involvement as their children seem to adjust well in the transition.

Implications for Theory and Practice

The present study contributes to the literature by revealing the moderating role of children's school liking in the longitudinal associations between coparenting experiences and parental

involvement for Chinese parents during school transitions. Consistent with spillover and compensation theories, coparenting experience at the mother-father level influenced parental involvement at the parent-child level, with the association significantly moderated by children's school liking. The findings of this study reveal that negative coparenting, i.e., triangulation, could also lead to positive parental functioning when considering children's school liking as a moderator. This supplements the consensus that positive coparenting leads to improvements in parental functioning and negative coparenting increase the risk of functioning problems (Solmeyer and Feinberg, 2011; Lau and Power, 2018; Kanter and Proulx, 2019). As such, an important implication of this study would be to take children's characteristics into consideration when enhancing positive coparenting and reducing negative coparenting to increase parental involvement during school transitions. When a child showed low levels of school liking, parents-especially fathers-perceiving more cooperation should be encouraged to communicate more with the school to aid the children's adjustment. Meanwhile, mothers of children with high levels of school liking should be encouraged to decrease their triangulation to their spouse to improve paternal involvement at home. Fathers of children with low levels of school liking should be encouraged to keep their involvement level to support the child.

Strengths and Limitations

This study has several strengths. First, although accumulating studies have suggested that father involvement should be considered as an important part of family process (McWayne et al., 2013; Kim and Hill, 2015), paternal involvement in the context of school transition is relatively rare (for a review, see Kim and Hill, 2015). This study included fathers as a coparent in the associations between coparenting experience and parental involvement, and further involved children's characteristics, i.e., school liking, as a moderator in the above associations. Second, supplementing to previous cross-sectional associations between coparenting experience and parental involvement, the longitudinal data in the present study described the change of parental involvement in school transition predicted by coparenting experience and children's school liking. Third, given that the traditional adult methods, such as parental reports of child behavior, have been criticized for bypassing children's own voices (Lambert et al., 2013), children's school liking was measured using puppet interviews to better reflect children's feelings.

Although innovative, this study has several limitations. First, the generalizability of the finding may be influenced by recruiting

participants in Hong Kong. Hong Kong is a special administration region in China, adhering to Chinese culture but deeply influenced by other cultures due to its colonist history. Future studies may consider conducting study in more Chinese cities. Second, parental involvement and coparenting were measured by parents' self-reports. By only using parental reports, there may be an informant bias because parental reports are based on subjective judgment. Future research should consider collecting parents' data using observational measures and spouse reports. Third, as parents who dropped out from the study had low education levels and low levels of father-reported maternal cooperation, the findings of this study may not be representative enough of those parents. Future studies should consider focusing on specific groups of parents such as those with low levels of education. Fourth, child school liking was measured at T1 only (kindergarten). Future research could examine if longitudinal data of school liking could help reveal the direction of effect on children liking school and mother involvement, and whether parental involvement in school influences children's school liking in the first grade.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Human Research and Ethics Committee. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

ST conducted the analysis and wrote the paper. EL designed the study and guided the project. All authors contributed to the article and approved the submitted version.

FUNDING

This work was supported by the Research Grant Council (ECS 28401914).

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Material Hardship in Families With Low Income: Positive Effects of Coparenting on Fathers' and Mothers' Parenting and Children's Prosocial Behaviors

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OPEN ACCESS

Edited by:

Nicola Carone,
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Reviewed by:

Michele Giannotti,
University of Trento, Italy
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Sabancı University, Turkey

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Specialty section:

This article was submitted to
Gender, Sex and Sexualities,
a section of the journal
Frontiers in Psychology

Received: 23 June 2021

Accepted: 01 November 2021

Published: 09 December 2021

Citation:

Lee JY, Volling BL and Lee SJ
(2021) Material Hardship in Families
With Low Income: Positive Effects
of Coparenting on Fathers'
and Mothers' Parenting
and Children's Prosocial Behaviors.
Front. Psychol. 12:729654.
doi: 10.3389/fpsyg.2021.729654

Families with low income experience high levels of economic insecurity, but less is known about how mothers and fathers in such families successfully navigate coparenting and parenting in the context of material hardship. The current study utilized a risk and resilience framework to investigate the underlying family processes linking material hardship and children's prosocial behaviors in a sample of socioeconomically disadvantaged mother-father families with preschoolers from the Building Strong Families project ($N = 452$). Coparenting alliance and mothers' and fathers' responsive parenting were examined as mediators. Results of structural equation modeling showed that coparenting alliance was associated with higher levels of both mothers' and fathers' responsive parenting. Subsequently, both parents' responsive parenting were associated with higher levels of children's prosocial behaviors. Material hardship was not associated with coparenting alliance and either parent's responsive parenting. Tests of indirect effects confirmed that the effects of coparenting alliance on children's prosocial behaviors were mediated through both mothers' and fathers' responsive parenting. Overall, these results suggest that when mothers and fathers have a strong coparenting alliance, they are likely to withstand the negative effects of material hardship and thus engage in positive parenting behaviors that benefit their children's prosocial development. Family strengthening interventions, including responsible fatherhood programs, would do well to integrate a strong focus on enhancing a positive coparenting alliance between mothers and fathers.

Keywords: Building Strong Families, Family Stress Model, risk and resilience framework, material hardship, coparenting alliance, responsive mothering and fathering, children's prosocial behaviors

INTRODUCTION

Material hardship—defined as challenges with paying for food, housing, utilities, or medical care—is prevalent among American families with low income, with 70% of such families reporting some level of material hardship (Ouellette et al., 2004; Karpman et al., 2018). Although empirical evidence on the effects of material hardships on family functioning is more limited than those of income poverty material hardship has been linked with negative family and child outcomes, including lower

levels of interparental relationship quality (Lucas et al., 2020), less sensitive parenting (Newland et al., 2013), and children's lower cognitive skills and socioemotional competence (Gershoff et al., 2007). That said, less is known about the family process underlying some of these links in two-parent families with low income and whether resilience present in such families buffers the negative effects of material hardship on relevant family processes and ultimately children's development. Thus, the current study aimed to utilize a risk and resilience framework to understand underlying family processes (e.g., coparenting and parenting) linking material hardship and young children's prosocial behaviors using data from the Building Strong Families (BSF) project, a large and racially diverse sample of socioeconomically disadvantaged mother-father families with low income.

Theoretical Framework: The Family Stress Model

The Family Stress Model (FSM; Conger et al., 1992) was first devised to understand better the impact of negative economic events on families in the Midwestern United States during the Great Farm Crisis in the 1980s. The earliest FSM studies used samples of White families in rural farming communities in Iowa (Conger et al., 1990, 1992, 1993, 1994) and showed that negative economic events were associated with poor outcomes for children mainly through their effects on parents' mental health, relationship quality, and parenting behaviors. Specifically, the FSM posits that economic pressures arising from negative economic events such as low family income, income loss, unstable work, or debts can lead to higher levels of depressive moods for both mothers and fathers, which then lead to relationship strain in the form of interparental conflict. Subsequently, poor interparental relationship quality is linked to lower involved or nurturant parenting behaviors that ultimately result in children's maladjustment (Conger et al., 1992).

Expanding on this work, researchers have also tested the FSM with racially diverse samples and have found support for the model (Conger et al., 2002; Parke et al., 2004; Masarik and Conger, 2017; Gard et al., 2020; Curran et al., 2021; Lee et al., 2021). For example, Lee et al. (2021) recently applied the FSM to a sample of BSF families and found that fathers' depressive symptoms was a mediating path between material hardship, but not income poverty, and destructive interparental conflict. Curran et al. (2021) also applied the FSM to a BSF sample and showed in cross-lagged panel models that fathers' depressive symptoms at the 15-month follow-up predicted higher levels of destructive interparental conflict at the 36-month follow-up, but not vice versa. Both studies underscore the centrality of paternal mental health as a significant factor affecting family processes, namely interparental relationship quality.

Neither BSF study, however, included parenting nor child outcomes, and more importantly, both focused on testing the FSM looking at family conflict and poor mental health and did not use a risk and resilience framework and consider the buffering effects of positive family dynamics. The current study was designed to test how a supportive coparenting alliance between mothers and fathers predicted responsive parenting and

in turn, children's prosocial behavior in an effort to look at protective factors within families experiencing material hardship.

Material Hardship to Coparenting Alliance and Mothers' and Fathers' Responsive Parenting

Prior studies have examined the links between material hardship, coparenting alliance, and responsive parenting behaviors (Gershoff et al., 2007; LeBaron et al., 2020; Curran et al., 2021). Coparenting alliance is often characterized by both parents' investments in their children, a respect for each other's judgment about child rearing, and a desire to communicate child-related information (Weissman and Cohen, 1985; Feinberg, 2003). Recently, LeBaron et al. (2020) used a sample of two-parent families from the BSF project and showed that material hardship at the 15-month follow-up was linked with lower levels of fathers' perceived coparenting alliance (i.e., communication, support, and teamwork), but not mothers' perceived coparenting alliance, at the 36-month follow-up. The researchers noted the possibility that when fathers with low income are faced with financial strain that makes it difficult to help meet their families' material needs, they may end up prioritizing financially providing for their families over building a coparenting alliance with mothers (LeBaron et al., 2020). That is, stress with meeting their families' material needs may undermine socioeconomically disadvantaged fathers' abilities to successfully engage in positive coparenting behaviors with their partners. Alternatively, mothers may be more likely to engage in gatekeeping behaviors when fathers do not meet breadwinner norms (e.g., unemployed) (Waller, 2012) and the financial stress associated with material hardship and meeting the needs of the family may take its toll on the coparenting relationship. Unlike LeBaron et al. (2020) though, Curran et al. (2021) in their cross-lagged modeling of material hardship and coparenting alliance using BSF data found that material hardship at the 15-month follow-up was not associated with either mothers' or fathers' perceived coparenting alliance at the 36-month follow-up.

Findings on material hardship and responsive parenting also seem to be mixed, and available studies seem to primarily focus on mothers. In one study examining links between material hardship and mothers' positive parenting, Shelleby (2018) used data from the Fragile Families Child Wellbeing Study (FFCWS) and found that material hardship when children were a year old was not linked with mothers' positive parenting (e.g., praise child, warmth) when children were 5 years old. They did not include information on fathers, even though work cited earlier suggested that men's mental health was a contributing factor to family conflict. Gershoff et al. (2007) also focused predominantly on mothers by using data from the Early Childhood Longitudinal Study-Kindergarten cohort (ECLS-K) and found that material hardship was linked with higher levels of maternal positive parenting (e.g., warmth, cognitive stimulation) when children were 6 years old—a finding that was unexpected. The researchers noted that mothers may be investing in positive parenting behaviors, when they are unable to provide economic resources to improve their children's lives. Few studies focus specifically

on material hardship and fathers' positive parenting, and instead use indicators of fathers' economic conditions (e.g., employment status, living in poverty) to examine relations between fathers' parenting and children's outcomes (Johnson, 2001; Waller, 2012; Baker et al., 2018). For example, using a sample of fathers from the FFCWS, Waller (2012) showed that fathers being employed when their children were 3 years old was associated with mothers' reports of fathers spending more time with their children but fathers engaging in a lower number of daily activities (e.g., playing outside, reading stories, and singing songs).

When studies do include both mothers and fathers from socioeconomically disadvantaged backgrounds, which again are limited in number, there is evidence that lack of economic resources can negatively affect the quality of parent-child relationships. For instance, Baker et al. (2018) examined fathers and mothers from the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B) and showed that poverty levels were related to lower levels of paternal warmth and cognitive stimulation during fathers' interactions with their 24-month-old children in the home. Family poverty was associated only with lower levels of cognitive stimulation during mother-child interactions. Overall, given the mixed results of prior research and limited number of studies including both mothers and fathers, additional research is needed to understand better the links between material hardship, the coparenting alliance, and mothers' and fathers' responsive parenting among families with low income.

Coparenting Alliance and Children's Prosocial Behaviors via Mothers' and Fathers' Responsive Parenting

Research has examined relations specifically between the coparenting alliance and positive parenting behaviors for both mothers and fathers from socioeconomically disadvantaged backgrounds (Jones et al., 2005; Shook et al., 2010; Barnett et al., 2011; Fagan and Palkovitz, 2011; Lee et al., 2020). For example, Barnett et al. (2011) used a community sample of mothers whose children were enrolled in Head Start and found that mothers' reports of a supportive coparenting alliance predicted maternal warmth with their 4-year-old children. In a study with mothers and fathers from the FFCWS, Fagan and Palkovitz (2019) showed that mothers' reports of a supportive coparenting alliance when children were a year old predicted higher levels of fathers' engagement (e.g., read stories, sing songs, play) when the children were 3 years old. Recently, Lee et al. (2020) used BSF data and found that a supportive coparenting alliance between mothers and fathers at the 15-month follow-up predicted higher levels of fathers' engagement in caregiving such as clothing and feeding at the 36-month follow-up, but only for residential fathers.

Positive Parenting and Children's Prosocial Development

Mothers' and fathers' positive parenting behaviors—such as being sensitive to the needs of the child and displaying warmth—are linked with children's development of prosocial behaviors starting in early childhood (Grusec et al., 2002; Davidov and Grusec, 2006; Eisenberg et al., 2006; Hastings

et al., 2007; Biringen and Easterbrooks, 2012; Brownell et al., 2013). Children's prosocial behaviors include showing concern for others and a willingness to help or share with others. Although much of this research has been conducted with middle-class families, several studies have tested similar relations among families with low income. For example, using a community sample of families with low income, Barnett et al. (2012) found that maternal sensitivity was positively associated with prosocial behaviors when children were 24–36 months old. Studies examining fathers' contributions—especially those from socioeconomically disadvantaged backgrounds—to young children's prosocial behaviors are limited. Of the few available studies, Newton et al. (2014) using data from the National Institute of Child Health and Human Development Study of Early Child Care (NICHD-SECC) reported that both paternal and maternal sensitivity during structured observational tasks when children were 54 months old positively predicted children's prosocial behaviors when they were 9 years old. Unfortunately, Newton et al. (2014) conducted separate analyses for mothers and fathers, rather than taking the interdependence between mothers and fathers into consideration and modeling the joint contribution of mothers and fathers to children's prosocial development.

Because research suggests that girls generally engage in more prosocial behaviors than boys (Rose and Rudolph, 2006; Baillargeon et al., 2011; Kornbluh and Neal, 2014), we also considered children's gender as a moderator of the paths between responsive parenting and children's prosocial behaviors. Rose and Rudolph (2006) found gender differences in children's prosocial behaviors in their review of the literature. Specifically, girls were consistently more prosocial than boys, as reported by both peers and teachers, across the kindergarten, elementary, and middle school years. Research on younger children appears mixed, with Baillargeon et al. (2011) finding that preschool girls were more likely than boys to show prosocial behaviors (e.g., will try to help someone who has been hurt, comforts a child who is crying or upset) between 29 and 41 months, but Yeh et al. (2018) finding no significant differences between girls' and boys' prosocial behaviors (e.g., offering to help, being kind toward peers, cooperative with peers).

The Current Study

The current study aimed to utilize a risk and resilience approach to investigate the underlying family processes linking material hardship and children's prosocial behaviors in a sample of socioeconomically disadvantaged mother-father families with preschoolers. Positive coparenting in the form of supportive alliance between mothers and fathers and responsive parenting were examined as mediators. There were three hypotheses based on the FSM and prior research (see **Figure 1**; Conger et al., 1994; Neppl et al., 2016; Gard et al., 2020; Lee et al., 2020). First, it was hypothesized that material hardship would be associated with a less supportive coparenting alliance at 15 months and less responsive parenting for both mothers and fathers at 36 months (H1). Second, a positive coparenting alliance would predict higher levels of mothers' and fathers' responsive parenting (H2). Finally, mothers' and fathers' responsive

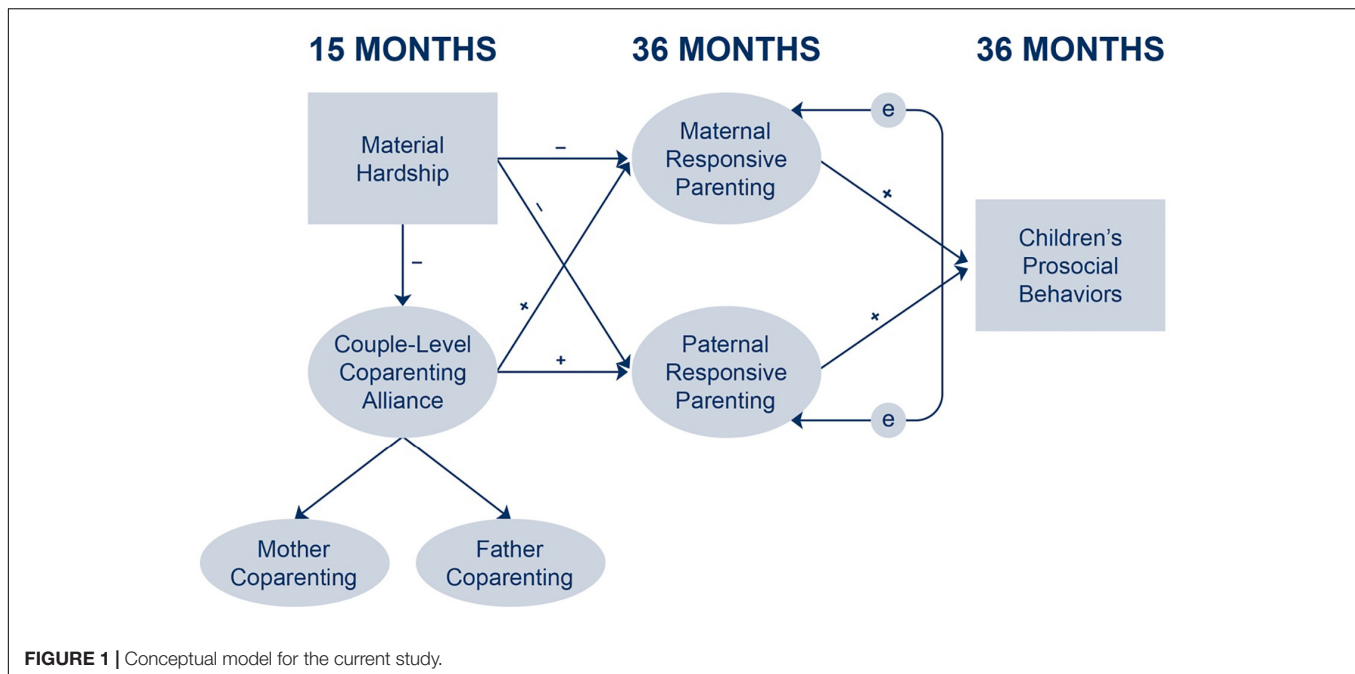


FIGURE 1 | Conceptual model for the current study.

parenting would be associated with higher levels of children's prosocial behaviors at 36 months and act as mediating pathways between coparenting alliance and children's prosocial behaviors (H3) (Barnett et al., 2012; Newton et al., 2014). This study makes an important contribution to the literature by examining how positive family functioning, such as supportive coparenting alliance, may serve as a source of resilience to ultimately buffer the negative effects of material hardship on children's socioemotional development, especially amongst children whose families experience poverty.

MATERIALS AND METHODS

The Building Strong Families Project

Data came from the BSF project, a large-scale evaluation of a healthy marriage and relationship education program conducted between 2002 and 2013 across the United States, among romantically involved unmarried heterosexual couples, who were expecting or recently had a baby together (Wood et al., 2010). The project was funded by the U.S. Department of Health and Human Services and implemented by Mathematica Policy Research, with the goal to strengthen couples' relationships and thus create healthy home environments for their children (Wood et al., 2014).

Procedures

BSF recruited 5,102 couples from hospitals, prenatal clinics, and special nutritional programs for Women, Infants, and Children (WIC). Couples were eligible to enroll if (a) both the mother and father agreed to participate in the intervention; (b) the couple was romantically involved; (c) the couple was either expecting a baby together or had a baby younger than 3 months old; (d) the couple was unmarried at the time the

baby was conceived; and (e) both parents were 18 years or older (Wood et al., 2010). Mathematica Policy Research obtained participants' written consent and randomly assigned couples into either an intervention group ($n = 2,553$) or a control group ($n = 2,549$). The BSF intervention focused on providing 30–42 hours of relationship skills education to enrolled couples in the form of group sessions. The control group couples could seek relationship skills education from other sources but were not provided with the BSF intervention services. Data collection included three time points: (1) Baseline when couples enrolled in the project; (2) 15 months after enrollment via telephone surveys; and (3) 36 months after enrollment via telephone surveys. At the 36 month-follow up period, direct observations of mother-child and father-child interactions were also conducted in addition to telephone surveys. Children's socioemotional developmental outcomes were only available at the 36-month follow-up period (see Moore et al., 2013 and Wood et al., 2014 for full details). The Health Sciences and Behavioral Sciences institutional review board at the University of Michigan approved the current study as secondary analysis of the BSF data (HUM00145063).

Participants

The analytic sample consisted of BSF families in which both mothers and fathers had completed parent-child observations from the 36 month follow-up period, which was the time at which responsive parenting was assessed in the current study. The majority of such families (80–99% depending on which parent's data were used) were residential in that both mothers and fathers reported living with each other and the focal BSF child. We further narrowed down our sample to families in which parents and the focal BSF child were consistently residential with each other across 15 and 36 months, the two times of measurement included in the current study. Aligned with prior research with

socioeconomically disadvantaged families (Waller and Emory, 2014; Fagan et al., 2016; Lee et al., 2020), parental residential status was defined as living with one's partner and child *all or most* of the time. Mothers and fathers reporting that they lived with each other or the focal BSF child some or none of the time were excluded. To create the analytic sample, of the 5,102 BSF families, 18 families with a deceased BSF partner were first excluded from the total sample. Second, 597 families from Baltimore were excluded because BSF only asked mothers and not fathers at this site to complete the parent-child observation sessions at the 36-month follow-up. Third, 3,314 families without observational data for both mothers and fathers were excluded. BSF collected observational data with majority residential families. Fourth, 517 families in which parents or the BSF child were not residential with each other at 15 months were excluded. Finally, another 204 families in which parents or the BSF child were not residential with each other at 36 months were excluded. The final analytic sample consisted of $N = 452$ families. Sample characteristics can be found in **Table 1**.

Measures

Material Hardship

Material hardship was a key independent variable and measured at the 15-month follow-up survey, using four items with dichotomous 0 = *No* or 1 = *Yes* responses: (1) *Ability to pay rent* –

families' hardship paying rent or mortgage in the past year (i.e., "You could not pay the full amount of the rent or mortgage?"); (2) *Consistency of utilities* – the hardship families experienced related to utilities in the past year (i.e., "You had services turned off by the water, gas, or electric company or the oil company would not deliver oil in the past 12 months because you could not afford to pay the bill?"); (3) *Residential stability* – the hardship families experienced related to housing in the past year (i.e., "You were evicted from your home or apartment because you could not pay the rent or mortgage?"); and (4) *Medical care* – the hardship families experienced related to medical insurance [e.g., "Are you currently covered by Medicaid, (STATE/LOCAL FILL), or any other government program that pays for medical care?"]. The medical care indicator was reverse coded with 1 indicating the presence of medical hardship with respect to insurance coverage. Although material hardship measures often include food insecurity as a relevant indicator of materials hardship, a food insecurity item was not available in the BSF dataset. Mothers' reports were used primarily to create a variable indicating families' material hardship although where data from mothers were missing, fathers' reports were used. A total score was created by summing across all four items to create a composite of material hardship, ranging from 0 to 4.

Coparenting Alliance

Coparenting alliance between mothers and fathers was assessed at the 15-month follow-up survey and served as one of the mediating variables. Mothers' and fathers' reports of positive coparenting were measured using 10 items from the Parenting Alliance Index (PAI; Abidin and Brunner, 1995). The items represented a parent's positive assessment—coparenting alliance and communication—of another parent as a coparent (e.g., "I believe my child's other parent is a good parent," "My child's other parent and I communicate well about our child," "I feel good about my child's other parent's judgment about what is right for our child," "My child's other parent makes my job of being a parent easier," "My child's other parent and I are a good team"). Fathers and mothers rated these items on a 5-point scale ranging from 1 = *strongly agree* to 5 = *strongly disagree*. The scale was reverse coded so that higher scores reflected higher levels of coparenting alliance. All 10 items served as individual indicators for fathers' and mothers' individual coparenting latent variables to be described later.

Parenting Behaviors

Mothers' and fathers' parenting behaviors observed at the 36-month direct assessment served as additional mediating variables. Parenting behaviors were observed and videotaped separately during the two-bags task, a 10-min semi-structured, free-play interaction task between a parent and child (Administration for Children and Families, 2002). The two-bags task is a modified version of the three-bags task (NICHD Early Child Care Research Network, 1999). Specifically, the task involved the interviewer placing a mat and two bags on the floor and asking the parent and child to spend time playing with objects in the two bags. The parent initially was instructed to open the first bag, which included a book inside, and then

TABLE 1 | Sample descriptive statistics.

Variable	<i>M (SD)</i> or %
Mothers' age (range: 18–41 years)	23.75 (4.96)
Fathers' age (range: 18–55 years)	26.29 (6.00)
Couples' ethnicity and race:	
Black	35.5
White	29.78
Latinx	25.11
Other	9.56
Couples' education:	
Neither parent has high school diploma	13.72
One parent has high school diploma	34.41
Both parents have high school diploma	52.88
Fathers' employment status (Yes)	82.96
Fathers' multiple-partner fertility (Yes)	27.43
Fathers' involvement in caregiving ^b (range: 1–6) ^b	4.19 (0.91)
Fathers' depressive symptoms ^a (range: 0–3)	0.26 (0.35)
Mothers' depressive symptoms ^a (range: 0–3)	0.36 (0.50)
Family material hardship ^a :	
Could not pay rent or mortgage	16.81
Utilities turned off because could not pay	7.52
Eviction from apartment or home	1.55
Lack of health insurance	91.81
Child sex (Boy) ^a	46.43
Assignment in the BSF program (Intervention)	52.65

$N = 452$. Otherwise stated, all variables are from baseline when couples enrolled in the BSF program. BSF, Building Strong Families.

^aVariable is from the 15-month follow-up period.

^bVariable is from the 36-month follow-up period.

move on to the second bag, which included pretend play toys inside. The parent was further informed that he or she could divide the 10 minutes between the two bags as he or she wished. Eighteen trained coders rated six parenting behaviors from the parent-child interaction videos in a centralized location using the same rating system as the NICHD Study of Early Child Care Research Network (NICHD Early Child Care Research Network, 1999).

This rating system employs a 7-point scale ranging from 1 = *not at all characteristic* to 7 = *very characteristic* to code (a) *sensitivity*, which is the ability to perceive and accurately interpret the child's behavior and respond appropriately; (b) *intrusiveness*, which pertains to interventions or overstimulation that impinges on the child's independence; (c) *detachment*, which represents lack of involvement and disengagement with the child; (d) *positive regard*, which corresponds with demonstrating positive feelings toward the child; (e) *negative regard*, which corresponds to demonstrating negative feelings toward the child; and (f) *stimulation of cognitive development*, which involves scaffolding the child's cognitive development during the task. All six parenting variables were used in the development of latent variables representing mothers' and fathers' responsive parenting.

Children's Prosocial Behaviors

Children's prosocial behaviors were assessed at the 36-month follow-up, using nine items from an adapted version of the Social Interaction Scale of the Preschool and Kindergarten Behavior Scales—Second Edition (PKBS-2; Merrell, 2002). The items represent young children's prosocial behaviors (e.g., "Comforted other children who were upset") in the last 3 months (Moore et al., 2013). Items from the PKBS-2 Social Interaction Scale have been adapted for use in large surveys, such as the Early Childhood Longitudinal Survey-Birth Cohort and Universal Preschool Child Outcome Study (Moore et al., 2013). Mothers rated the nine items on a 4-point scale, ranging from 1 = *often* to 4 = *never*. The scale was converted to range from 0 to 3, and the items were reverse averaged so that higher scores represented more prosocial behaviors ($\alpha = 0.76$).

Sociodemographic Control Variables

A robust set of sociodemographic variables primarily from baseline were used as control variables in all the analytic models. These control variables were selected by examining related literature (Lee et al., 2020) and conducting correlations with the main study variables. Significant correlations were present between main study variables and the following 10 control variables: Couples' race and ethnicity (White, Black, Latinx, other), couples' education level (neither parent has a high school diploma, only one parent has a high school diploma, both parents have a high school diploma), couples' relationship length, fathers' employment status, mothers' depressive symptoms, fathers' depressive symptoms, fathers' multiple partner fertility, fathers' involvement in caregiving (composite of three items pertaining to feeding, diapering, and changing clothes), BSF random assignment status, and BSF program site location. All control variables were from baseline, except for mothers' and fathers' depressive symptoms, which were from the 15-month

follow-up, and fathers' involvement in caregiving, which was from the 36-month follow-up.

Specifically, mothers' depressive symptoms ($r = 0.14$, $p = 0.003$) and fathers' depressive symptoms ($r = 0.19$, $p < 0.001$) were positively correlated with family material hardship. Mothers' depressive symptoms ($r = -0.25$, $p < 0.001$) were negatively correlated with mothers' reports of coparenting alliance. Being Latinx ($r = -0.12$, $p = 0.010$), fathers' depressive symptoms ($r = -0.20$, $p < 0.001$), and BSF program site location ($r = -0.09$, $p = 0.049$) were negatively correlated with fathers' reports of coparenting alliance. Being randomly assigned to the BSF intervention group ($r = 0.18$, $p < 0.001$) was positively correlated with fathers' reports of coparenting alliance. Fathers' employment ($r = 0.14$, $p = 0.003$) and fathers' multiple partner fertility ($r = -0.10$, $p = 0.038$) were positively and negatively correlated with mothers' responsive parenting, respectively. Neither parent having a high school diploma ($r = -0.12$, $p = 0.011$) was negatively correlated with fathers' responsive parenting, whereas both parents having a high school diploma ($r = 0.10$, $p = 0.037$) was positively correlated with fathers' responsive parenting. Finally, being White ($r = 0.10$, $p = 0.032$), being Black ($r = 0.17$, $p < 0.001$), and both parents having a high school diploma ($r = 0.14$, $p = 0.002$) were positively correlated with children's prosocial behaviors. Being Latinx ($r = -0.32$, $p < 0.001$), only one parent having a high school diploma ($r = -0.11$, $p = 0.015$), and couple relationship length ($r = -0.13$, $p = 0.015$) were negatively correlated with children's prosocial behaviors.

Model Development and Data Analysis Plan

Correlations between the main variables, including indicators of key factors, can be found in **Table 2**. Consistent with prior literature using BSF data, we used observed variables for material hardship (Curran et al., 2021; Lee et al., under review) and children's prosocial behaviors (Love et al., 2009) and created latent variables for coparenting alliance (Lee et al., 2020) and mothers' and fathers' responsive parenting (Caughy et al., 2016).

Preliminary Analyses and Data Reduction

Preliminary analyses involved exploratory factor analysis (EFA) to examine the number of factors underlying indices of mothers' and fathers' observed parenting behaviors. Eigenvalues were used to determine the number of factors. According to Kaiser's criterion, factors with eigenvalues equal or higher than 1 can be retained (Kaiser, 1960). Separate unrotated principal factor EFAs were conducted for mothers and fathers, using each parent's six parenting behaviors (i.e., sensitivity, positive regard, negative regard, cognitive stimulation, intrusiveness, and detachment) as individual items. For both parents, EFA results suggested a single factor model with the eigenvalues of the first factors being 2.59 for mothers 2.52 for fathers. All subsequent factors had eigenvalues less than 1. These first factors for mothers and fathers accounted for 90.19% and 93.19% of the total variance of the parenting items, respectively.

TABLE 2 | Descriptive statistics and correlations of mothers' and fathers' coparenting alliance and responsive parenting indicators and latent variables.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Mothers' reports of coparenting alliance at 15 months																				
1 Good parent	–																			
2 Communication	0.48***	–																		
3 Good judgment	0.41***	0.50***	–																	
4 Job easier	0.36***	0.45***	0.49***	–																
5 Good team	0.43***	0.60***	0.53***	0.56***	–															
6 Handle children	0.42***	0.44***	0.50***	0.47***	0.51***	–														
7 Solve problems	0.37***	0.49***	0.56***	0.53***	0.62***	0.48***	–													
8 Personal sacrifice	0.40***	0.43***	0.38***	0.45***	0.53***	0.42***	0.49***	–												
9 Like talking	0.47***	0.58***	0.50***	0.47***	0.64***	0.47***	0.55***	0.48***	–											
10 Pays attention	0.46***	0.41***	0.47***	0.53***	0.51***	0.54***	0.50***	0.49***	0.48***	–										
Fathers' reports of coparenting alliance at 15 months																				
11 Good parent	0.15**	0.07	–0.01	0.07	0.11*	0.12*	0.12**	0.17***	0.06	0.11*	–									
12 Communication	0.06	0.06	–0.02	0.09	0.10*	0.10*	0.08	0.10*	0.01	0.07	0.37***	–								
13 Good judgment	0.10*	0.00	0.05	0.11*	0.14**	0.14**	0.18**	0.13**	0.05	0.09*	0.54***	0.50***	–							
14 Job easier	0.10*	0.04	0.03	0.04	0.06	0.06	0.05	0.06	0.07	0.08	0.36***	0.39***	0.39***	–						
15 Good team	0.13**	0.08	0.12*	0.18***	0.24***	0.24***	0.22***	0.18**	0.14**	0.18**	0.46***	0.51***	0.55***	0.48***	–					
16 Handle children	0.09	0.10	0.01	0.11*	0.11*	0.11*	0.13**	0.11	0.06	0.12*	0.50***	0.43***	0.62***	0.48***	0.57***	–				
17 Solve problems	0.01	0.03	–0.02	0.10*	0.03	0.03	0.09	0.14**	0.03	0.04	0.37***	0.48***	0.45***	0.39***	0.49***	0.51***	–			
18 Personal sacrifice	0.14**	0.04	0.04	0.12*	0.16***	0.16***	0.17***	0.17***	0.08	0.15**	0.56***	0.42***	0.55***	0.52***	0.61***	0.63***	0.56***	–		
19 Like talking	0.11*	0.05	0.08	0.15*	0.14**	0.14**	0.19***	0.21***	0.10	0.12**	0.40***	0.45***	0.58***	0.44***	0.56***	0.57***	0.50***	0.56***	–	
20 Pays attention	0.16***	0.07	0.10*	0.05	0.11*	0.11*	0.11*	0.13**	0.10*	0.07	0.44***	0.32***	0.45***	0.50***	0.49***	0.59***	0.45***	0.64***	0.54***	–
<i>M</i>	4.76	4.61	4.60	4.42	4.60	4.53	4.60	4.66	4.67	4.72	4.82	4.67	4.74	4.65	4.71	4.74	4.66	4.77	4.67	4.77
<i>SD</i>	0.44	0.56	0.60	0.75	0.62	0.64	0.61	0.61	0.55	0.51	0.39	0.53	0.49	0.59	0.49	0.45	0.53	0.45	0.53	0.48

(Continued)

TABLE 2 | (Continued)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Mothers' reports of responsive parenting at 36 months																				
21 Sensitivity	0.15**	0.01	0.07	0.03	0.06	0.07	0.09	0.08	0.07	0.07	0.05	0.05	0.12**	0.09	0.13**	0.08	0.00	0.07	0.13**	0.11*
22 Positive regard	0.15**	0.04	0.16***	0.12**	0.16***	0.12**	0.12*	0.16***	0.13**	0.10*	0.13**	0.06	0.16***	0.10*	0.17***	0.10*	0.03	0.14**	0.12**	0.11*
23 Cognitive stimulation	0.14**	0.03	0.06	0.07	0.07	0.08	0.08	0.08	0.08	0.07	0.04	−0.01	0.07	0.02	0.02	0.01	0.02	0.05	0.01	0.02
24 Intrusiveness	−0.06	0.04	0.05	0.03	0.00	0.02	0.00	−0.02	0.00	0.00	−0.10*	−0.10*	−0.07	−0.07	−0.09	−0.07	0.00	−0.08	−0.10*	−0.11*
25 Negative regard	0.02	0.04	−0.01	−0.04	−0.03	0.00	−0.01	−0.03	−0.02	−0.03	0.01	−0.03	−0.09	−0.09	−0.07	0.00	0.04	−0.07	−0.10*	−0.08
26 Detachment	−0.08	−0.07	−0.10*	−0.06	−0.09	−0.05	−0.10*	−0.05	−0.08	−0.05	0.00	0.05	−0.08	−0.07	−0.08	−0.10*	0.03	−0.03	−0.08	−0.06
Fathers' reports of responsive parenting at 36 months																				
27 Sensitivity	0.14**	0.09*	0.06	0.07	0.08	0.09*	0.09	0.07	0.07	0.05	−0.01	−0.03	0.02	0.05	0.12*	0.05	0.01	0.04	0.11	0.06
28 Positive regard	0.13**	0.05	0.03	0.03	0.06	0.11*	0.02	0.02	0.05	0.07	0.05	−0.02	−0.01	0.00	0.05	0.01	−0.11*	0.04	0.07	0.07
29 Cognitive stimulation	0.09	−0.05	0.09	0.08	0.08	0.13**	0.08	0.06	0.04	0.10*	0.09	0.00	0.14**	−0.04	0.08	0.12**	−0.02	0.11*	0.10*	0.08
30 Intrusiveness	−0.17	−0.07	0.02	−0.02	−0.05	−0.07	−0.06	−0.01	−0.06	−0.04	0.01	0.07	−0.01	−0.05	−0.04	0.03	0.08	0.05	−0.01	0.01
31 Negative regard	−0.03	−0.07	0.00	−0.03	−0.03	−0.10*	−0.07	−0.02	−0.06	−0.02	0.06	0.09	−0.01	0.02	−0.06	−0.02	0.06	0.02	−0.10*	−0.05
32 Detachment	−0.07	−0.10*	−0.07	−0.04	−0.07	−0.06	−0.05	−0.02	0.04	−0.02	0.03	0.01	0.02	−0.07	−0.08	−0.03	−0.03	−0.05	−0.11*	−0.08
33 Material hardship	−0.02	−0.09	0.03	−0.04	−0.02	0.00	−0.05	−0.03	−0.04	−0.07	−0.03	0.06	0.04	−0.01	−0.01	−0.02	−0.04	0.00	0.03	−0.03
34 Child prosocial behaviors	0.13**	0.04	0.06	−0.02	0.04	0.06	0.02	0.06	0.04	0.05	0.17***	0.00	0.15**	−0.01	0.06	0.09	0.01	0.11*	0.06	0.12*
<i>M</i>	4.76	4.61	4.60	4.42	4.60	4.53	4.60	4.66	4.67	4.72	4.82	4.67	4.74	4.65	4.71	4.74	4.66	4.77	4.67	4.77
<i>SD</i>	0.44	0.56	0.60	0.75	0.62	0.64	0.61	0.61	0.55	0.51	0.39	0.53	0.49	0.59	0.49	0.45	0.53	0.45	0.53	0.48

(Continued)

TABLE 2 | (Continued)

Variable	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Mothers' reports of responsive parenting at 36 months														
21 Sensitivity	–													
22 Positive regard	0.64***	–												
23 Cognitive stimulation	0.39***	0.50***	–											
24 Intrusiveness	–0.68***	–0.33***	–0.10*	–										
25 Negative regard	–0.49***	–0.032***	–0.11*	0.52***	–									
26 Detachment	–0.60***	–0.43***	–0.30***	0.22***	0.31***	–								
Fathers' reports of responsive parenting at 36 months														
27 Sensitivity	0.24***	0.19**	0.16***	–0.15**	–0.07	–0.18**	–							
28 Positive regard	0.16***	0.14*	0.12*	–0.14**	–0.13**	–0.07	0.63***	–						
29 Cognitive stimulation	0.19***	0.24***	0.27***	–0.16***	–0.07	–0.10*	0.41***	0.43***	–					
30 Intrusiveness	–0.15**	–0.12**	–0.14**	0.13**	0.06	0.07	–0.63***	–0.33***	–0.14**	–				
31 Negative regard	–0.21***	–0.12**	–0.13**	0.13**	0.21***	0.15**	–0.51***	–0.35***	–0.11*	0.51***	–			
32 Detachment	–0.18***	–0.14**	–0.10*	0.12**	0.12**	0.18**	–0.59***	–0.42***	–0.30***	0.17***	0.30***	–		
33 Material hardship	0.05	0.02	–0.01	–0.03	0.01	–0.01	0.04	0.06	0.05	–0.03	–0.02	–0.04	–	
34 Child prosocial behaviors	0.21***	0.24***	0.28***	–0.14**	–0.01	–0.13**	0.19***	0.12*	0.22***	–0.11*	–0.02	–0.05	0.05	–
<i>M</i>	4.69	4.40	4.15	2.97	2.13	2.46	4.62	4.35	4.10	3.02	2.05	2.39	1.35	2.37
<i>SD</i>	1.10	0.98	1.11	1.13	0.96	1.06	1.07	0.95	1.11	1.13	1.02	1.05	0.50	0.51

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

TABLE 3 | Fit indices of individual confirmatory factor analysis models.

Model	df	χ^2	p	RMSEA	90% CI	CFI	SRMR
First-order coparenting by mothers	35	54.26	<0.001	0.05	(0.02, 0.07)	0.98	0.03
First-order coparenting by fathers	35	66.35	<0.001	0.06	(0.04, 0.09)	0.97	0.04
Second-order coparenting by couples	190	2596.97	<0.001	0.04	(0.03, 0.05)	0.97	0.04
Mothers' responsive parenting	15	1105.34	<0.001	0.07	(0.03, 0.11)	0.99	0.03
Fathers' responsive parenting	15	1019.68	<0.001	0.07	(0.03, 0.11)	0.99	0.03
Mothers' responsive parenting and fathers' responsive parenting combined	66	2243.73	<0.001	0.05	(0.04, 0.07)	0.98	0.05
Second-order coparenting and parents' responsive parenting combined	451	660.79	<0.001	0.04	(0.03, 0.04)	0.96	0.05

RMSEA, Root Mean Square Error Approximation; CI, Confidence Interval; CFI, Comparative Fit Index; SRMR, Standardized Root Mean Square Residuals.

Building Latent Variables

Given the nature of the longitudinal and multiple reporter data available, analyses were designed in steps for purposes of model building. Building the model of interest from the smallest specified pieces ensures that all the pieces in the model are appropriately specified and fit the data well (Kline, 2016). Informed by the results of the EFA, a single factor CFA model was first tested with all six parenting variables for both parents. Models for both mothers and fathers converged normally, with fit indices indicating decent model fit and all factor loadings above the absolute value of 0.42 (for details, see **Tables 3, 4**). Next, a separate CFA was conducted to build a latent variable representing couple-level coparenting relationship quality variable (see also Lee et al., 2020). Because each parent reported on the other parent's coparenting (e.g., "I believe my child's other parent is a good parent") rather than their own coparenting, both mothers' and fathers' reports of the coparenting relationship were used to create a second-order, couple-level latent variable to assess the dyadic nature of the coparenting construct. This process involved creating first-order coparenting latent variables for mothers and fathers using individual coparenting items reported by mothers and fathers. That is, two first-order coparenting latent variables were built, one for mothers and another for fathers. Models for both parents converged normally and had good fit to the data (**Table 3**). Factor loadings for individual coparenting items were all above 0.58 for both parents (**Table 4**). The two first-order coparenting latent variables were then used to create a single second-order coparenting latent variable that represented coparenting alliance present at the couple level instead of the individual parent level. Following recommendations for conducting dyadic analysis within a structural equation modeling (SEM) framework (Gonzalez and Griffin, 2012), we fixed the loadings for mothers' and fathers' first-order coparenting latent variables to be equal at 1. The residual variances of these first-order latent variables were also fixed to be equal. These constraints were imposed to reflect mothers' and fathers' equal contributions to the dyadic coparenting latent variable. Once more, the model with the second-order coparenting latent variable converged normally and had good fit to the data (see **Tables 3, 4**). Finally, a model combining the second-order coparenting latent variable with mothers' and fathers' responsive parenting latent variables was built and tested. This final combined model converged normally and had good fit to the data as shown in **Table 3**.

Building the Structural Equation Model

The study used SEM as its main analytic method to test paths specified in the conceptual model (**Figure 1**). Specifically, the associations between family material hardship and children's prosocial behaviors mediated by coparenting alliance and mothers' and fathers' responsive parenting were tested. The SEM models included the responsive parenting latent variables for mothers and fathers, and the couple-level coparenting alliance latent variable built previously. Material hardship and children's prosocial behaviors were composites that served as observed variables in the model. SEM analyses were conducted using the R package *lavaan* (Rosseel, 2012) to estimate the models. Due to non-normality in some of the variables (mainly the coparenting alliance items), the robust maximum likelihood (MLR) estimator was used, which produces a scaled Yuan-Bentler chi-square statistic test and Huber-White standard errors that are robust to non-normality in the data (Huber, 1967; Yuan and Bentler, 2000). Indirect effects were tested by estimating Monte Carlo confidence intervals, which involves repeating thousands of random draws from the joint distribution of parameter estimates of interest (*a* and *b*) to produce a sampling distribution of an indirect effect (*ab*). This information is then used to estimate confidence intervals for the indirect effect (Preacher and Selig, 2012). Monte Carlo confidence intervals yield comparable results as the non-parametric bootstrapped confidence intervals in simulation studies, with similar advantages (i.e., no distributional assumptions about the indirect effect and thus allowing for asymmetry in its confidence interval) (Preacher and Selig, 2012). The null hypothesis that no indirect effect exists is tested by examining whether the Monte Carlo confidence interval includes a zero. If the confidence interval does not include a zero, then we can claim that an indirect effect is different from zero (Dearing and Hamilton, 2006; Preacher and Hayes, 2008).

Model fit was evaluated using several fit indices (see Kline, 2016), including Root Mean Square Error Approximation (RMSEA; Steiger, 1990; <0.06 for good fit); 90% confidence intervals (CIs) of RMSEA (<0.05 for lower bound for good fit; Kenny, 2015); Comparative Fit Index (CFI; Bentler, 1990; >0.95 for good fit); and Standardized Root Mean Square Residuals (SRMR; Hu and Bentler, 1999; <0.05 for good fit). The chi-square test of significance was reported but not primarily relied upon to assess model fit because it has been shown to be highly sensitive to sample size (Kline, 2016). Children's gender was examined as a moderator, given prior literature indicating possible gender

differences in children's prosocial behaviors (Rose and Rudolph, 2006). Measurement invariance tests and multigroup analyses were conducted to examine differences in family processes when the focal child was either a boy or girl.

Because the sample was drawn from a larger intervention study and because BSF random assignment status was significantly correlated with one of the study variables (i.e., coparenting alliance as reported by fathers), preliminary analyses examined BSF random assignment status as a moderator of the main SEM models. Upon establishing configural and metric invariances, comparison between the constrained model that fixed all regression paths to be equal across BSF intervention and control group families and an unconstrained model that allowed all regression paths to vary across the two groups showed that the two models were not significantly different from each other, $\Delta\chi^2(30) = 37.73$, $p = 0.157$. These results suggest that models did not differ across BSF families in the intervention and control groups and that the unconstrained model should be retained. Therefore, we report the analyses for the larger combined sample of BSF families.

Missing Data

Stata Version 15.1 (StataCorp, 2017) was used to engage in missing data analysis. Missingness pattern analysis results

showed that missing data were <1% for all main and sociodemographic control variables. The only exception was couples' relationship length variable which were missing 2.43% of the cases. To account for missing data, full information maximum likelihood (FIML) was used in the SEM models. FIML estimates parameters by maximizing the sample and using all available data (Kline, 2016) and has been shown to produce less biased and more efficient estimates than other missing data methods (e.g., listwise deletion) (Allison, 2003).

RESULTS

Sample characteristics are presented in **Table 1**. Descriptive statistics and correlations between main study variables are presented in **Table 2**.

Structural Equation Modeling Results

The main SEM model examined links between families' material hardship, couple-level coparenting alliance, mothers' and fathers' responsive parenting and children's prosocial behaviors. As shown in **Figure 2**, structural paths were estimated between (a) material hardship and coparenting alliance; (b) material hardship and mothers' responsive parenting; (c) material hardship and

TABLE 4 | Measurement model: Factor loadings for latent variables.

Indicator	Unstandardized estimate	SE	p	Standardized estimate
Coparenting alliance at 15 months				
First-order coparenting by fathers				
CO1A: Child's other parent is a good parent	1.00	—	—	0.64
CO1B: Other parent and I communicate well	1.24	0.12	<0.001	0.59
CO1C: Feel good about other parent judgment	1.43	0.11	<0.001	0.74
CO1D: Other parent makes parenting job easier	1.45	0.12	<0.001	0.62
CO1E: Other parent and I are a good team	1.49	0.13	<0.001	0.76
CO1F: Other parent knows how to handle child	1.42	0.11	<0.001	0.78
CO1G: We work a good solution together	1.35	0.12	<0.001	0.66
CO1H: Other parent willing to sacrifice	1.47	0.12	<0.001	0.82
CO1I: Look forward to talking with other parent	1.51	0.14	<0.001	0.74
CO1J: Other child pays attention to child	1.34	0.13	<0.001	0.71
First-order coparenting by mothers				
CO1A: Child's other parent is a good parent	1.00	—	—	0.58
CO1B: Other parent and I communicate well	1.53	0.17	<0.001	0.69
CO1C: Feel good about other parent judgment	1.64	0.21	<0.001	0.69
CO1D: Other parent makes parenting job easier	1.93	0.22	<0.001	0.67
CO1E: Other parent and I are a good team	1.95	0.21	<0.001	0.80
CO1F: Other parent knows how to handle child	1.71	0.16	<0.001	0.68
CO1G: We work a good solution together	1.80	0.19	<0.001	0.74
CO1H: Other parent willing to sacrifice	1.51	0.17	<0.001	0.65
CO1I: Look forward to talking with other parent	1.66	0.15	<0.001	0.75
CO1J: Other child pays attention to child	1.35	0.15	<0.001	0.69
Second-order coparenting by couples				
First-order coparenting by mothers	1.00	—	—	0.45
First-order coparenting by fathers	1.00	—	—	0.45

(Continued)

TABLE 4 | (Continued)

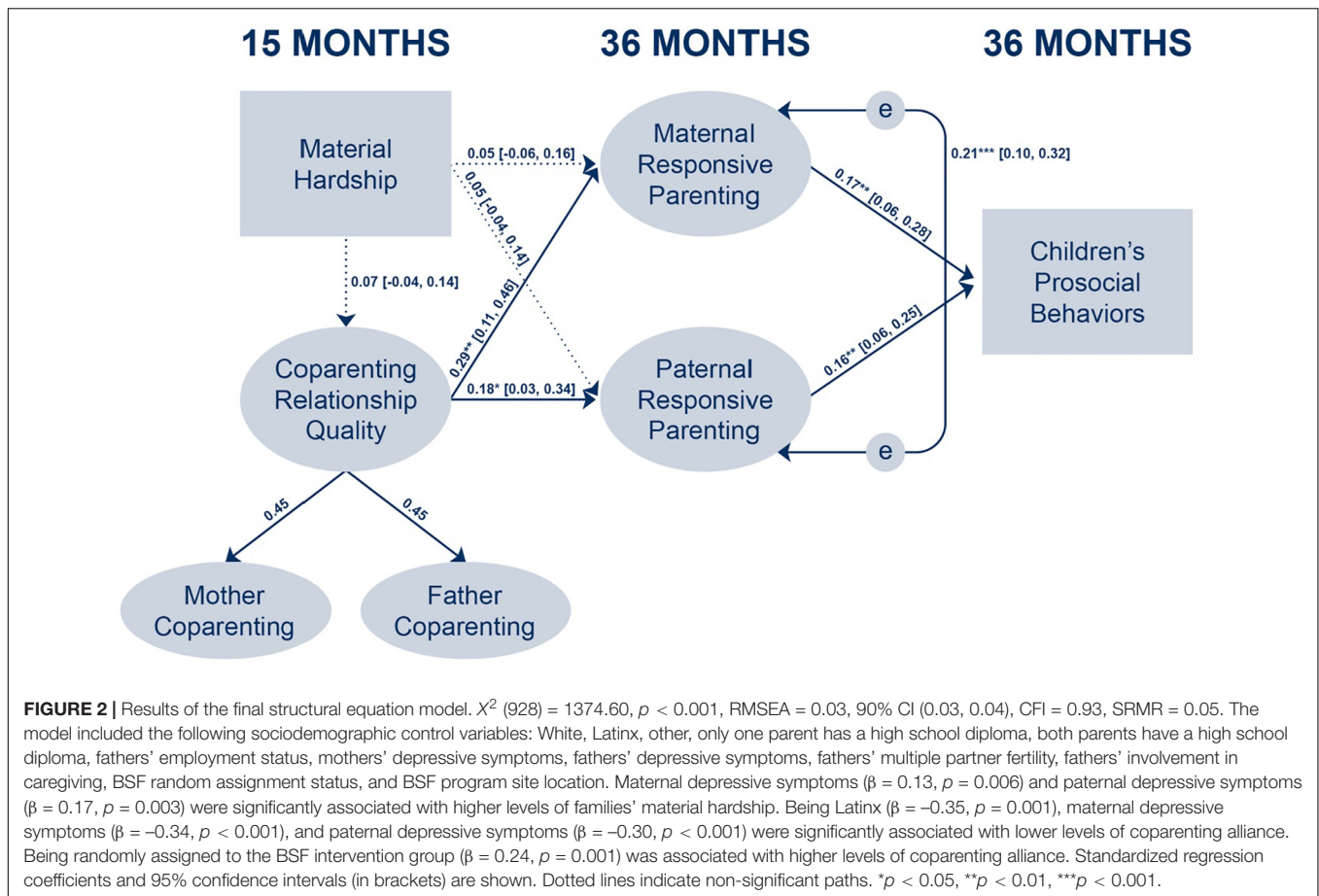
Indicator	Unstandardized estimate	SE	p	Standardized estimate
Responsive parenting at 36 months				
Fathers' responsive parenting				
Sensitivity	1.00	—	—	0.98
Detachment	−0.60	0.05	<0.001	−0.60
Positive regard	0.59	0.05	<0.001	0.64
Negative regard	−0.53	0.06	<0.001	−0.54
Cognitive stimulation	0.45	0.06	<0.001	0.43
Intrusiveness	−0.56	0.06	<0.001	−0.51
Mothers' responsive parenting				
Sensitivity	1.00	—	—	0.95
Detachment	−0.64	0.07	<0.001	−0.63
Positive regard	0.63	0.05	<0.001	0.67
Negative regard	−0.46	0.06	<0.001	−0.50
Cognitive stimulation	0.43	0.05	<0.001	0.42
Intrusiveness	−0.56	0.06	<0.001	−0.52
Correlated errors				
Fathers' detachment and intrusiveness	−0.17	0.04	<0.001	−0.21
Fathers' negative regard and intrusiveness	0.28	0.04	<0.001	0.33
Fathers' positive regard and cognitive stimulation	0.16	0.04	<0.001	0.21
Fathers' sensitivity and intrusiveness	−0.16	0.06	0.013	−0.71
Mothers' positive regard and cognitive stimulation	0.21	0.04	<0.001	0.30
Mothers' negative regard and intrusiveness	0.25	0.04	<0.001	0.32
Mothers' detachment and intrusiveness	−0.11	0.04	0.009	−0.14
Mothers' sensitivity and intrusiveness	−0.24	0.06	<0.001	−0.73
Fathers' negative regard and mothers' negative regard	0.15	0.04	<0.001	0.20
Fathers' cognitive stimulation and mothers' cognitive stimulation	0.15	0.04	0.001	0.15
Fathers' responsive parenting and mothers' responsive parenting	0.22	0.06	<0.001	0.21

fathers' responsive parenting; (d) coparenting alliance and mothers' responsive parenting; (e) coparenting alliance and fathers' responsive parenting; (f) mothers' responsive parenting and children's prosocial behaviors; and (g) fathers' responsive parenting and children's prosocial behaviors. The SEM model converged normally, and the model had good fit to the data, $\chi^2(928) = 1374.60$, $p < 0.001$, RMSEA = 0.03, 90% CI (0.03, 0.04), CFI = 0.93, SRMR = 0.05.

Figure 2 also shows that material hardship at 15 months was not significantly linked with any of the main variables, including the coparenting alliance at 15 months [$\beta = 0.07$, $p = 0.353$, 95% CI (−0.04, 0.14)], maternal responsive parenting at 36 months [$\beta = 0.05$, $p = 0.411$, 95% CI (−0.06, 0.16)], and paternal responsive parenting at 36 months [$\beta = 0.05$, $p = 0.282$, 95% CI (−0.04, 0.14)]. Coparenting alliance at 15 months was a significant positive predictor of both maternal and paternal responsive parenting at 36 months: Maternal responsive parenting, $\beta = 0.29$, $p = 0.001$, 95% CI (0.11, 0.46), and paternal responsive parenting, $\beta = 0.18$, $p = 0.020$, 95% CI (0.03, 0.34). Maternal responsive parenting at 36 months subsequently was a significant positive predictor of children's prosocial behaviors at 36 months, $\beta = 0.17$, $p = 0.002$, 95% CI (0.06, 0.28). Similarly, paternal responsive parenting at 36 months was a significant positive predictor of children's

prosocial behaviors at 36 months $\beta = 0.16$, $p = 0.001$, 95% CI (0.06, 0.25).

Tests of indirect effects were conducted by estimating the Monte Carlo confidence intervals for the indirect effects. We used a random draw of 100,000 samples to obtain the sampling distributions of the six main indirect effects. This included the indirect effects of (1) maternal responsive parenting as a mediator between material hardship and children's prosocial behaviors; (2) maternal responsive parenting as a mediator between coparenting alliance and children's prosocial behaviors; (3) paternal responsive parenting as a mediator between material hardship and children's prosocial behaviors; (4) paternal responsive parenting as a mediator between coparenting alliance and children's prosocial behaviors; (5) coparenting alliance as a mediator between material hardship and maternal responsive parenting; and (6) coparenting alliance as a mediator between material hardship and paternal responsive parenting. Examination of the Monte Carlo confidence intervals showed that only those for the second and fourth indirect effects involving coparenting alliance, responsive parenting, and children's prosocial behaviors did not include a zero and indicated significant indirect effects: Maternal responsive parenting as a mediator between coparenting alliance and children's prosocial behaviors, indirect effect = 0.22, 95% CI (0.04,



0.48); and paternal responsive parenting as a mediator between coparenting alliance and children's prosocial behaviors, indirect effect = 0.13, 95% CI (0.01, 0.29). The Monte Carlo confidence intervals for all other indirect effects did include a zero and therefore were not significant: Maternal responsive parenting as a mediator between material hardship and children's prosocial behaviors, indirect effect = 0.01, 95% CI (−0.01, 0.03); paternal responsive parenting as a mediator between material hardship and children's prosocial behaviors, indirect effect = 0.01, 95% CI (−0.01, 0.03); coparenting alliance as a mediator between material hardship and maternal responsive parenting, indirect effect = 0.04, 95% CI (−0.05, 0.14); and coparenting alliance as a mediator between material hardship and paternal responsive parenting, indirect effect = 0.03, 95% CI (−0.03, 0.10). Together, these results confirmed that maternal and paternal responsive parenting mediated the associations between the coparenting alliance and higher levels of children's prosocial behaviors.

Moderation Analyses

Girls in our sample did not exhibit significantly higher prosocial behaviors than boys (girls: $M = 2.39$, $SD = 0.49$; boys: $M = 2.35$, $SD = 0.53$) based on one-way analysis of variance results, $F(1) = 0.69$, $p = 0.407$. With that in mind, we still proceeded to examine children's gender as a potential moderator. Measurement invariance was first conducted using

children's gender as a grouping variable. Both configural and metric invariance were tested. Only configural invariance was present in the latent variables across boys and girls, and the chi-square test result comparing the constrained model that fixed all regression paths to be equal across boys and girls to an unconstrained model that allowed all regression paths to vary across boys and girls showed that the two models were not significantly different from each other, $\Delta\chi^2(32) = 32.45$, $p = 0.445$. Thus, our results suggested that processes linking material hardship, coparenting alliance, and mothers' and fathers' responsive parenting, and children's prosocial behavior may not vary across families with boys and girls and that the unconstrained model should be retained.

DISCUSSION

The current study utilized a risk and resilience approach to understanding the effects of material hardship on preschoolers' prosocial behaviors as mediated by supportive coparenting alliance and mothers' and fathers' responsive parenting. Using a sample of families from socioeconomically disadvantaged backgrounds, we tested three specific hypotheses based on the FSM and prior research. First, we hypothesized that material hardship would be associated with less supportive coparenting

alliance and less responsive parenting for both mothers and fathers (H1). Next, a stronger coparenting alliance would predict more responsive maternal and paternal parenting (H2). Finally, maternal and paternal responsive parenting would be linked with higher levels of children's prosocial behaviors and act as mediating pathways between coparenting and children's prosocial behaviors (H3).

Resilience Against the Adverse Effects of Material Hardship on Responsive Parenting

Although our results did not support the first hypothesis of the negative effects of material hardship on less supportive coparenting alliance and parental responsiveness, there was more support for the second and third hypotheses. The fact that material hardship did not appear to have an effect on both coparenting and parenting was surprising, as we expected that material hardship should affect family relations adversely as proposed by the FSM (Conger et al., 1992). Again, FSM posits that economic pressures stemming from negative economic events such as low family income lead to poorer interparental relationship quality, which is subsequently linked with less involved and nurturant parenting behaviors (Conger et al., 1992). However, from a resilience and risk perspective—which allows for understanding how certain positive family functioning may be protective against the negative impact of economic difficulties on families and children—it is possible that BSF families in our sample found ways to be resilient against the adverse effects of material hardship. Specifically, a strong positive coparenting relationship between BSF mothers and fathers may have served a source of resilience, buffering against the potentially negative effects material hardship could have had on subsequent parenting behaviors.

Relatedly, while the FSM proposes negative effects of material hardship on family functioning, research evidence with BSF families or families from similarly disadvantaged backgrounds show rather mixed findings in this area. The current study's findings would appear both consistent and inconsistent with the results of such prior work examining the links between material hardship, coparenting alliance, and responsive parenting (Waller, 2012; Baker et al., 2018; Shelleby, 2018; LeBaron et al., 2020; Curran et al., 2021). For examples, our results are consistent with those of Curran et al. (2021) who used a cross-lagged panel analyses with 4,424 BSF families and found that material hardship at 15 months did not predict either parent's coparenting alliance 36 months, suggesting that a strong sense of coparenting alliance may be robust against material hardship's negative effects. However, our results are inconsistent with those of LeBaron et al. (2020), who found that for a BSF sample, material hardship at 15 months negatively predicted fathers' (but not mothers') reports of coparenting alliance at 36 months.

There are few reasons why our findings may be different from what others have found (i.e., LeBaron et al., 2020). For one, there are differences in sample characteristics across studies, even in cases where BSF families were the focus. For example, our sample included only mothers and fathers with complete

observational data at 36 months, which meant most of these couples included a residential father living with both the mother and child given that home observations were not conducted with the majority of couples who were not residing together. LeBaron et al. (2020), on the other hand, included both residential and non residential father families, with nearly half of the families having non residential fathers. Further, mothers and fathers in the current analyses were living consistently together across the two times of measurement, which might suggest that these couples had a stronger coparenting alliance than those in LeBaron et al. (2020), and this more supportive coparental alliance may have protected couples against the negative effects of material hardship for those in the current study.

Another reason for the differences may pertain to statistical methods and analyses. Given the nature of the coparenting alliance that involves both parents, we employed a latent variable approach to create a measure of dyadic coparenting, taking both mothers' and fathers' reports into consideration. LeBaron et al. (2020) chose to use separate reports of mothers' and fathers' coparenting in their analysis. The effects of material hardship may differ for men and women in the family based on the differing societal expectations of gendered roles for mothers and fathers, with mothers often assuming more child care responsibilities and fathers more responsible for the family's economic security. As such, parents may be more or less vulnerable to the effects of material hardship when considering mothers and fathers separately that we do not see when considering coparenting as a dyadic construct. Whatever the exact reason for differences in results between studies, our results suggest that BSF couples focused on working together as a coparenting team may be resilient against stressors and risk stemming from poverty.

Associations Between the Coparenting Alliance, Mothers' and Fathers' Responsive Parenting and Children's Prosocial Behaviors

We found support for our second hypothesis that a supportive coparenting alliance at 15 months predicted more responsive parenting for both mothers and fathers at 36 months (H2), as well as our third hypothesis that mothers' and fathers' responsive parenting predicted higher levels of children's prosocial behaviors at 36 months (H3). In line with a risk and resilience approach to testing the FSM, the coparenting alliance—in which two parents coordinate and cooperate in their parenting roles—seemed to have acted as the “executive subsystem” that improves family functioning and thus children's developmental outcomes (Minuchin, 1988; Cox et al., 2001), including those amongst socioeconomically disadvantaged families (Jones et al., 2005; Shook et al., 2010; Barnett et al., 2011; Fagan and Palkovitz, 2011; Lee et al., 2020).

For example, for mothers from low income backgrounds, positive coparenting in the form of support and communication has been linked with increased levels of mothers' positive perceptions of fathers' engagement (e.g., childcare and play activities with the children) (Fagan and Palkovitz, 2011) and mothers' supportive parenting behaviors toward the child

characterized by high levels of sensitivity, cognitive stimulation, and positive regard (Barnett et al., 2011, 2012; Cabrera et al., 2012). Similarly, when parents cooperate as a coparenting team, fathers with low income were more likely to spend time with their children (Coley and Chase-Lansdale, 1999), engage in caregiving activities (Lee et al., 2020), provide instrumental support, and communicate with the mother about their children (Hohmann-Marriott, 2011). In light of such prior research, again our findings suggest that a strong coparenting alliance may be beneficial to both parents and children in that it serves as a source of resilience for families facing material hardship. Should parents with low income work to maintain supportive coparenting relationships, even in economically challenging circumstances, mothers and fathers can still engage in responsive and stimulating parenting practices that ultimately benefit their children's socioemotional development.

Moreover, in the current study, the coparenting alliance between mothers and fathers had an indirect effect on children's prosocial behavior through promoting both mothers' and fathers' responsive parenting practices. This is consistent with our third hypothesis (H3) and prior research showing similar mechanisms by which coparenting is positively linked to children's developmental outcomes (Cabrera et al., 2012; Yan et al., 2018). For example, Cabrera et al. (2012) used a sample from ECLS-B to show that for both married and cohabiting families, coparenting communication between mothers and fathers when children were 24 months old was concurrently linked with higher levels of mothers' supportive parenting, which was then linked with higher levels of children's social skills (e.g., playing with other children, trying to understand others) when the children were 4 years old. The researchers did not test fathers' supportive parenting, however. Notably, in our study, while maternal responsive parenting had an indirect effect larger in magnitude than paternal responsive parenting, the significant indirect effect of paternal responsive parenting suggests that fathers make an important contribution to their preschoolers' prosocial development even after accounting for maternal effects. In other words, both mothers and fathers seemed to play a role in promoting their children's development of prosocial behaviors. Given the limited research in this area, especially using data from both mothers and fathers from low income backgrounds, our finding makes an important contribution to better understanding processes underlying coparenting and young children's socioemotional development in such families.

In summary, by taking a risk and resilience approach to testing the FSM, results from the current study suggest that coparenting alliance plays a protective role amidst risk ensued by material hardship. That is, even in economically challenging circumstances when mothers and fathers with low income work together toward having supportive coparenting relationships (i.e., a source of resilience for the family), they may be able to engage in responsive parenting practices. Importantly, the supportive coparenting relationship mothers and father shared in our sample seemed to have worked as an executive subsystem that contributed to both parents' positive parenting behaviors that ultimately supported their young children's socioemotional

development. For these families, having a strong alliance between mothers and fathers around coparenting served as a source of resilience and thus played a protective role against the risks of experiencing material hardship.

Limitations

There are several limitations to the current study that need to be noted. Although food insecurity is a key aspect of material hardship, we were unable to include it as part of the measure of material hardship because the BSF project did not collect information on the food needs BSF families faced. Further, results cannot be generalized to larger groups of families with low income because BSF families were a unique group willing to participate in a marriage and relationship improvement intervention. In addition, only a subset of families with complete observational parenting data for both mothers and fathers were used here, and observational data were mainly collected and available for couples living in the same household. These families were likely to have been highly motivated to strengthen their coparental and parent-child relationships from the beginning. Parents with low income are diverse, and therefore, family processes may play out differently depending on the residential status of the father, as well as families' race and ethnicity (Lee et al., 2020). Future studies may want to consider using family structure, such as fathers' residential status, and race and ethnicity as possible moderators when looking at the effects of material hardship on family relationship functioning and children's outcomes. Despite these limitations, the current study contributes to the literature by taking a risk and resilience approach to family stress brought on by economic hardship to understand underlying family processes in a large and racially diverse sample of two-parent families with young children.

Implications for Family Strengthening Policies and Practices

The findings have implications for family strengthening policies and practices as well. As it pertains to the national Healthy Marriage and Responsible Fatherhood (HMRP) policy initiatives and subsequent responsible fatherhood programs, one of the goals of these policy and programmatic efforts has been to help fathers overcome barriers (i.e., unemployment, child support orders, relationship instability, access to parenting education) so they may engage in nurturant parenting (Patnaik and Avellar, 2020). The main idea is that by improving fathers' parenting, responsible fatherhood programs can ultimately benefit children. Results of the current study suggest that focusing on strengthening the coparenting alliance in the face of economic stressors may be fruitful, as a strong coparenting alliance seemed to emerge as a protective factor that promoted responsive fathering (and mothering). Responsible fatherhood programs may want to consider focusing on strengthening the sense of solidarity and teamwork around coparenting between mothers and fathers with low income.

Prior large demonstration projects-funded by the Administration of Children and Families at the U.S. Department of Health and Human Services, including the BSF project and

the more recent Parents and Children Together (PACT)-have not given much attention to strengthening the coparenting alliance nor to supporting parents to work together as a parental team to raise their children to the same extent that these programs have focused on couples' relationships and marriages (Wood et al., 2014; Zaveri et al., 2015; Avellar et al., 2018). For instance, BSF's main goal was to improve marriage rates among couples with low income expecting a child and thus a focus on coparenting was almost non-existent in the curricula programs used as part of the project (Wood et al., 2014). PACT's main goals were to improve adult and father-child relationships. While the programs included coparenting content in their curricula, much of it seemed to be delivered in a single workshop or formed only a small part of many lessons provided under large curricular themes, such as "Parenting and Fatherhood" or "Relationships and Marriage" (Zaveri et al., 2015). Much like BSF, the PACT project placed a larger focus on improving romantic relationships over coparenting relationships, with workshops focusing on conflict management, communication, and the impact of parents' intimate relationships on children (Zaveri et al., 2015).

Not surprisingly, the PACT evaluation did not have any program effects on coparenting, including coparenting alliance, and recommendations for future projects included a focus on improving coparenting to promote father involvement (Avellar et al., 2018). Smaller scale studies that primarily focus on implementing coparenting interventions—with curricula focusing on creating coparenting solidarity, sharing parenting responsibilities, and improving communication around parenting—have demonstrated program effectiveness in reducing coparenting conflict and improving parenting, including father involvement in caregiving activities (Fagan, 2008; Pruett et al., 2019). For example, Fagan (2008) conducted a randomized study of the Minnesota Early Learning Design coparenting program with young Black and Latinx couples and found positive program effects on mothers' and fathers' coparenting behaviors and fathers' engagement in infant care. These results suggest that federally funded demonstration projects and responsible fatherhood programs aiming to improve fathers' parenting will do well to focus on implementing programs specifically designed to strengthen the coparenting alliance between mothers and fathers.

Related to this is the importance of including mothers in responsible fatherhood programs, as researchers have suggested that coparenting aspects of these programs would be more effective if mothers were also the recipients of coparenting education and training (Cowan and Cowan, 1995; Fagan, 2008). Recently, McKee et al. (2020) reported that the most significant predictor of parent participation in an intervention directed to low-income parents of infants was the participation of the other parent. More broadly, coparenting typically involves a minimum of two caregivers and cannot be carried out alone. Programs trying to enhance coparenting relationships may need to reflect this dyadic and family systems nature of coparenting. That is, a coparenting intervention may need buy-in from both fathers and mothers for it to be effective in improving the coparenting alliance and thus

benefit subsequent family processes. Although three out of four of the PACT programs encouraged mothers to join relationship workshops, they were often not well attended (Dion et al., 2015).

Programs like the Young Parenthood Program (YPP; Florsheim et al., 2012) and Supporting Fatherhood Involvement (SFI; Pruett et al., 2019) are promising examples of coparenting interventions that include both parents. A randomized controlled trial of YPP with adolescent fathers and mothers during the prenatal period showed positive direct effects on fathers' engagement in childrearing, fathers' reports of coparenting relationship quality (i.e., coparenting support and depth in dyadic relationship), and mothers' reports of coparenting competence (i.e., capacity to retain a positive perspective on the coparenting relationship and engage in positive coparenting behaviors) when children were 18 months old (Florsheim et al., 2012). For responsible fatherhood programs to be successful, program staff may need to convince mothers (and fathers) that they play important roles in creating supportive coparenting alliances that benefit their parenting and, ultimately, their children's wellbeing.

DATA AVAILABILITY STATEMENT

Restricted data were analyzed in this study, and the data can be found here: <https://www.icpsr.umich.edu/web/ICPSR/studies/29781/datadocumentation>.

ETHICS STATEMENT

The Health Sciences and Behavioral Sciences Institutional Review Board at the University of Michigan approved the current study as secondary analysis of the Building Strong Families (BSF) data (HUM00145063). The participants provided their written informed consent to participate in the original BSF study.

AUTHOR CONTRIBUTIONS

JYL and BLV conceptualized the main ideas of the manuscript. JYL conducted the main analyses, reviewed the results, interpreted the results, and wrote the manuscript. BLV reviewed the results, provided support for interpreting the results, and assisted with writing the manuscript. SJL reviewed the results and provided support for interpreting the results. All authors contributed to the article and approved the submitted version.

FUNDING

JYL was supported by the Family Strengthening Scholars grant from the Administration for Children and Families (Children's Bureau) (90PR0009) during the writing of this manuscript. SJL and BLV were supported by a grant from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) (R15HD091763).

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When Fathers Feel Socially Constrained to Assume a Role: A Negative Predictor of the Coparental Relationship in Switzerland

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OPEN ACCESS

Edited by:

Sarah E. DeMartini,
California State University, Chico,
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Reviewed by:

Justin Scott,
University of Maryland, Baltimore,
United States
Martin I. Gallegos,
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Specialty section:

This article was submitted to
Gender, Sex and Sexualities,
a section of the journal
Frontiers in Psychology

Received: 03 August 2021

Accepted: 10 December 2021

Published: 03 January 2022

Citation:

Favez N, Max A, Bader M and
Tissot H (2022) When Fathers Feel
Socially Constrained to Assume
a Role: A Negative Predictor of the
Coparental Relationship
in Switzerland.
Front. Psychol. 12:752805.
doi: 10.3389/fpsyg.2021.752805

Role distribution is a central issue for parents in the transition to parenthood, but little is known about the motivations in fathers to assume a specific role. Differences in work-family balance in each parent may be motivated by an individual choice mutually shared by both partners; however, in many couples, the parents may feel forced to adopt a traditional role distribution, either for financial reasons, or to comply with social expectations about what men and women should do when they are parents. This feeling of being socially constrained to adopt a role distribution that is not congruent with intrinsic motivations can generate dissatisfaction and may jeopardize the development of the interparental relationship. Coparenting refers to the emotional and instrumental support parents bring to each other in their parental tasks. It has been shown to be central in family functioning and a powerful predictor of children's emotional and cognitive development. In this study, we aimed to assess the extent to which different motivations for role distribution in fathers are predictive of the quality of the coparental relationship. A convenience sample of 144 fathers from the French-speaking part of Switzerland completed online questionnaires about their motivations, coparental relationship, and sociodemographic characteristics. Results showed that the reasons for role distribution were mainly economical, practical, and in order to meet personal expectations. Multivariate general linear modeling showed that role distribution that is constrained to meet social expectations and age were predictive of a less cohesive coparental relationship, whereas a deliberate choice in role distribution was linked to a more cohesive coparental relationship.

Keywords: fathers, motivation, role distribution, cohesive coparenting, non-cohesive coparenting

INTRODUCTION

Contemporary couples have to face important challenges, one of the most important of which is to reconcile family and professional life. This implies first, a sharing of the tasks between the two partners and second, for each partner to find a balance between family and work. These challenges are relatively new to couples: According to the so-called traditional family organization, roles are gendered, with the father taking the role of the breadwinner and the mother taking

the role of the child caregiver and housekeeper, each parent assuming strictly separated tasks. This distribution follows the traditional model according to which women were naturally (i.e., biologically) determined to take care of children, and men were naturally determined to provide resources for the family through their work outside of the home (Cowan and Cowan, 1992; Maurer et al., 2001; Perälä-Littunen, 2007; Lamb and Lewis, 2010).

Following the gender revolution in the second half of the twentieth century, the possibility of interchangeability of tasks between mothers and fathers came to the front with the growth in women's participation in the labor force. In the United States and in Western Europe, the increase in mothers' work hours was paralleled by an increase in fathers' participation in housework and childcare (National Institute of Child Health and Human Development (NICHD) Early Child Care Research Network, 2000; Gottfried et al., 2002; Jacobs and Kelley, 2006; Goldscheider et al., 2015; Frejka et al., 2018). However, the gender revolution is not accomplished yet: for example, the increase in the number of mothers in the workforce full time was not followed by a similar increase in the number of fathers being the primary caregiver (DeRose et al., 2019; Lee et al., 2020), and in dual-earner families, mothers still assume responsibility for most of the parenting duties, as social expectations regarding traditional roles are still present and influential (Yeung et al., 2001; Raley et al., 2012). This is particularly the case in Switzerland; in 2020, women still spent more time on domestic and family work than men did (28.7 vs. 19.1 h per week, respectively; Federal Statistical Office, 2021). Traditionally, Switzerland is a country where male employment is privileged and there is little direct help for families (compared with that in other Western European countries), so that the parental burden rests mainly on women (Jobin, 1995; Bonoli, 2007). As a consequence, parents may nowadays feel torn between the traditional roles they may be socially expected to endorse and the "new" roles that seem desirable to achieve equality. For fathers, combining involvement with children with their role as financial provider may be difficult, especially as the world of work still expects men to be fully dedicated to their work duties (McGill, 2014), and the lack of flexible work arrangements may constitute a structural barrier to increasing their involvement in the family (Carlson et al., 2021); on the other hand, men who become primary caregivers may have to face negative reaction from others who see them as "Mr. Mom" (Steinhour, 2018). Conversely, mothers engaged in the workforce have to face expectations of being a "good mother" dedicated to their children and simultaneously being competitive in professional work, this double agenda resulting in a burden that is heavier for women than it is for men (Craig, 2006; Borelli et al., 2017).

As a consequence, parents may have to face tensions within the family and between family and work. The latter work-family role conflict has been amply documented in the literature, role theory being one of the most influential explanations; that is, participation in one domain is made difficult by participation in the other (Goode, 1960). For example, a time-based conflict can occur when there are competing demands between the two domains; a strain-based conflict occurs when the stress met in one domain is carried over to the other, making the fulfillment of roles

difficult in the second domain; and a behaviors-based conflict occurs when behaviors required by one domain make it difficult to fulfill the requirement of the other domain (Greenhaus and Beutell, 1985). Many individual and relational negative outcomes of work-family role conflicts have been described (Allen et al., 2000), such as marital distress, more negative and less positive communication styles between partners, parents' depression, parent-child conflicts, and poorer physical and psychological health outcomes in children and parents (Bodenmann et al., 2007; Amstad et al., 2011; Hogan et al., 2014; Hill and Holmes, 2019). Several mechanisms explaining relational effects of work-family conflicts have been described, such as the spillover of work stress on both the parent-child relationship and the marital relationship (Perry-Jenkins et al., 2000; Bianchi and Milkie, 2010), or the crossover effect according to which the stress faced by one parent at work influences the relationship of the other parent with the child (Demerouti et al., 2005). However, roles are not necessarily conflictive; there may be a virtuous circle between family and work, as participation in a role may bring rewards (such as self-esteem) that may reinforce and enhance performance in the other role (Greenhaus and Powell, 2006).

Contextual factors (such as having a supportive job environment or a supportive family, the number of work hours, the degree of job security, the flexibility in the management of work hours, and the number of children and resulting burdens) have been shown to determine the extent to which an individual will have to face a work-family conflict or benefit from work-family enrichment (Michel et al., 2011b; Allen et al., 2013; Lapierre et al., 2018). However, more individual factors may also play a major role. Individual factors include the perception parents have of the workload or of stressors (a perception that is a strong moderator of the links between contextual factors and possible negative outcomes), the preference parents may have to work more or less hours than they actually do (Perry-Jenkins et al., 2000; Barnett and Hyde, 2001), and the extent to which task sharing and role endorsement meet the expectations of both parents (Fraenkel and Capstick, 2012). Indeed, whereas traditional sharing of tasks may meet their representations of parental roles (in some couples, both partners are intrinsically in favor of such an arrangement), in many couples, this arrangement is made for economic reasons or to comply with social expectations from the family or from the cultural environment; that is, it meets external factors but does not correspond to an intrinsic motivation. As a consequence, couple satisfaction may be affected negatively when partners feel constrained to adopt an unwanted role distribution (Amstad et al., 2011). Intrinsic motivation for parenting is one of the main predictors of paternal engagement (Lamb and Tamis-LeMonda, 2004). Whereas it has long been assumed that fathers are necessarily intrinsically motivated to be more invested in their work duties available data suggest that a significant portion of fathers at home have chosen to do so specifically to take care of their children and not only because they are unable to find a job (Lee et al., 2020). Moreover, some fathers may want to be engaged with their children and have expectations about parenthood (Goodman, 2005), but do not dare engage as much as they would like because of the negative reaction of their social environment

(Steinhour, 2018). There are thus two complementary facets in paternal engagement: first, the motivation of fathers to be engaged in the family or to be mainly invested in their work, and, second, the fear they may have of the perceptions by others—their social environment and/or the mother—of the choice they have made (whatever this choice may have been). Little is known about the extent to which the renouncement by fathers of their primary and intrinsic motivation negatively affects the relationship with the mother, and, specifically, the coparenting duties.

Coparenting is indeed the specific part of the couple relationship that is dedicated to raising a child. It refers to the support parents bring to each other, at an instrumental and emotional level, in their parental duties (McHale, 2007). Cohesiveness is a central feature of the coparental relationship, that is, a relation that is marked by reciprocity, equity, mutual acknowledgment, and collaboration between the parents. A cohesive coparenting relationship is a favorable context for the emotional and cognitive development of the child (Teubert and Pinquart, 2010, for a meta-analysis). In a dissatisfying relationship, several configurations of non-cohesive coparenting may appear: the relation may be conflictive, with frequent unresolved disputes in which the child is the subject and with possible competition to gain the interest of the child; it may be skewed, one of the parents disengaging from coparenting and parenting duties; and it may be devitalized, as in a relation in which there is collaboration in everyday life but no emotional support or acknowledgment of the other parent's efforts (Van Egeren and Hawkins, 2004; McHale and Lindahl, 2011). Coparenting consists of several dimensions in which cohesiveness may be implemented (Feinberg, 2003; Van Egeren and Hawkins, 2004; McHale, 2007; Feinberg et al., 2012): the child-rearing agreement, that is, the extent to which parents agree about parenting and education; support and undermining, that is, the emotional and instrumental support parents bring to each other or, on the contrary, the undermining of the other's parenting through criticism and disparagement; the division of labor, that is, the effective sharing of tasks; the joint management of family dynamics, that is, the way parents manage relationships within the family; and finally, parenting-based closeness, that is, the sense of working as a team.

Relational processes are central in the occurrence and installation of non-cohesive patterns: dissatisfaction in the relationship is, for example, a strong predictor of coparental difficulties. A feeling of inequity or unfairness in task sharing or role distribution may thus alter the coparental relationship, as each parent may feel that she or he is giving more than the other (Milkie et al., 2002; Dew and Wilcox, 2011; DeMaris and Mahoney, 2017). Giving up the role for which one has a primary motivation and feeling constrained to endorse another role may be at the root of a possible feeling of inequity. The negative consequences of maternal dissatisfaction with task sharing and the feeling of inequity in the relationship with the father have been well documented (Goldberg and Perry-Jenkins, 2004; Moller et al., 2008); however, no study to date has examined the extent to which possible thwarted motivations in fathers may be linked with difficulties in the coparental relationship.

In the context of a larger study on parental burnout, we explored the motivations mentioned by fathers for the specific role they have chosen. This study allowed us to explore the extent to which the feeling of being constrained in fathers may have negative consequences on their coparental relationship, over and above objective characteristics such as the number of father's or mother's work hours. We hypothesized that when fathers feel constrained, coparenting will be less cohesive. To date, few—if any—studies have focused on the links between paternal motivations and coparenting.

MATERIALS AND METHODS

Overview

The current study was part of a larger multisite and multinational study on parental burnout in different countries throughout the world conducted by an international consortium (International Investigation of Parental Burnout) led by the Catholic University of Louvain. Coparenting and motivation for role distribution were not surveyed in the general study; these variables were added to the Swiss part of the survey. As no specific instrument was available to assess motivation for role distribution, we created a questionnaire specifically designed for this study for exploratory purposes: Motivations for Role Distribution (MRD). Coparenting was assessed with the Coparenting Relationship Scale (CRS), a seven-dimension questionnaire that has been well validated in English and in French (original version: Feinberg et al., 2012; French version: Favez et al., 2021b). Participants were individuals (mothers as well as fathers), not couples. For the present study, we focused on fathers only.

Sample

The sample was a convenience sample of 144 fathers. Descriptive data on the sociodemographic characteristics of the sample are presented in **Table 1**.

Regarding income, 100% of fathers were engaged in a paid activity, and 90.2% declared that they lived as a dual-income parenting couple. All fathers declared that they lived in a middle-class to upper-middle-class neighborhood. Regarding family structure, 86.1% (124) of fathers declared that they lived in a biparental house with the mother of their children, 8.3% (12) declared that they lived in a stepfamily, 4.9% (7) declared that they lived as a single parent, and 0.7% (1) declared that they lived in a same-sex family.

TABLE 1 | Descriptive statistics for sociodemographic variables ($N = 143$).

Variable	<i>M</i>	<i>SD</i>	Min.	Max.
Age (years)	40.97	7.59	25	62
Number of study years	16.63	3.74	6	29
Number of children	1.86	0.86	1	6
Work hours (%)	85.44	18.21	30	100
Wife/partner work hours (%)	72.69	32.54	0	100

min, minimum; max, maximum.

Procedure

Recruitment was conducted through announcements in parents' associations, public hospitals, and pediatric offices. We invited parents to answer an online questionnaire for which a link was provided. The study was completely anonymous, as we requested no data identifying the participants (e.g., name, date of birth). The study was conducted before the start of the coronavirus pandemic.

The general study received the approval of the Ethical Committee of the Catholic University of Louvain in Belgium. The specific Swiss part of the study received the approval of the Ethical Committee of the State of Vaud.

Instruments

Coparenting

The coparenting relationship scale (CRS; Feinberg et al., 2012; French version: Favez et al., 2021b) contains 35 items along seven dimensions of coparenting. Four of these dimensions are worded in the positive or cohesive direction: "agreement" (four items, $\alpha = 0.82$ in this study), "closeness" (five items, $\alpha = 0.80$), "support" (six items, $\alpha = 0.93$), and "endorsement of partner's parenting" (seven items, $\alpha = 0.90$). Three dimensions are worded in the negative or non-cohesive direction: "exposure to conflict" (five items, $\alpha = 0.90$), "undermining" (six items, $\alpha = 0.86$), and "division of labor" (two items, $\alpha = 0.50$). Each item is assessed on a 7-point scale ranging from 0 (*not true of us*) to 6 (*very true of us*), except for items in the exposure to conflict dimension, for which items are assessed on a 7-point scale ranging from 0 (*never*) to 6 (*very often—several times a day*). Scores are obtained for each dimension by computing the means of the related items. Given its low internal consistency, the division of labor dimension was not considered in the analyses.

Motivations for Role Distribution

Eight items answered the question, "How did you decide on role distribution?": (1) I did not have a choice for economic reasons; (2) I did not have a choice for practical reasons (e.g., it was difficult to find childcare); (3) it was evident that this is how I wanted things to be; (4) I would have preferred something else, but social pressure made us adopt this kind of sharing; (5) in my domain, reducing work hours is difficult because of work constraints; (6) I felt that diminishing my work hours could give a negative image of me to my employer; (7) I felt that my close relatives would judge me negatively if I had reduced my work hours to take care of my child; and (8) I felt that my close relatives would judge me negatively if I had not reduced my work hours to take care of my child. The items were assessed on 5-point Likert scales, with the following anchor points: 1 (*completely false*), 2, 3 (*neither true nor false*), 4, and 5 (*absolutely true*).

Sociodemographic Data

We used an *ad hoc* questionnaire to collect sociodemographic data: age of the fathers (in years), number of children living at home, study level (number of years successfully achieved), neighborhood (lower, middle, upper-middle), work hours of the father, work hours of the wife/partner.

Statistical Analyses

A preliminary check was done to assess possible differences in coparenting according to family structure and to select the families to be included in the study. A full set of descriptive statistics (including mean and standard deviation) was then computed for all variables of the study. We finally performed multivariate general linear models (GLMs) to study the links between the eight motivations for role distribution and the coparenting dimensions. Age, number of children, education level, work hours of the father, and work hours of the mother were entered as covariates. Given the 13 predictors to be included (eight motivations and five covariates), the necessary sample size to ensure 80% power with an effect size of 0.15 was $N = 131$ (Ellis, 2010). Effect size was set according to meta-analyses in the coparenting domain, which generally report small to moderate effect sizes. For example, the effect of coparenting problems on child internalizing and externalizing symptoms was shown to be between 0.11 and 0.24 (Teubert and Pinquart, 2010). To increase statistical power, we performed correlational analyses between the eight items about motivation for role distribution and the six coparenting dimensions in order to select the motivational variables to be included in the models. To be included, a motivational variable had to be correlated with at least one of the coparenting dimensions. The final model included eight predictors, allowing us to ensure 90% power. Regarding the coparenting dimensions, skewness was between -1.111 and 2.393 , one dimension (undermining) being above the $-/+ 2.0$ threshold (Curran et al., 1996). We thus used a bootstrap on 1,000 samples to compute the parameter estimates (95% confidence interval), which is a robust method for non-normal data distribution (Efron and Tibshirani, 1993). Predictors were not multicollinear; average variance inflation factors were between 1.034 and 1.354, far below the maximum acceptable threshold of 5.0 (Chatterjee and Simonoff, 2013). No tolerance value was below 0.2. All statistical analyses were performed with IBM SPSS Statistics for Windows, version 26. Power was calculated by using G*Power software, version 3.1.9.6.

RESULTS

Preliminary Check

Significant differences appeared on coparenting according to family structure for coparenting agreement, $F(2, 140) = 6.48$, $p = 0.002$; closeness, $F(2, 140) = 14.38$, $p < 0.001$; support, $F(2, 140) = 7.34$, $p < 0.001$; undermining, $F(2, 140) = 6.23$, $p = 0.003$; and endorsement of partner's parenting, $F(2, 140) = 12.56$, $p < 0.001$. Contrasts showed that positive coparenting dimensions were significantly higher in biparental families than in single father families, and coparenting undermining was significantly higher in single father families than in biparental families and in stepfamilies. Coparental agreement, support, and endorsement of partner's parenting were higher in stepfamilies than in single father families, coparenting closeness was higher in stepfamilies than in the two other types of families, and there was less exposure to conflict in stepfamilies than in biparental families. The same-sex family was not included in

these comparisons, as there was only one family of this type. Given these results, further analyses were performed only in the group of biparental families, the family structure most represented in our sample, in order to avoid confound effects. One participant was further excluded for missing data. The final sample was thus 123 fathers living in a biparental family.

Descriptive Analyses

Descriptive data for the motivations for role distribution and for coparenting (means and score ranges) are displayed in **Table 2**. The three motivations that fathers perceived as being most related to their decision on role distribution were economic reasons, practical reasons, and the decision being considered “evident” by fathers. The less influential motivations were the two related to close relatives. Regarding coparenting, the means for the cohesive dimensions (agreement, closeness, support, and endorsement of partner’s parenting) were situated on the higher end of the scales, whereas the means for the non-cohesive dimensions (exposure to conflict, undermining) were situated on the lower end of the scales, which is congruent with the nature of the sample (a non-clinical convenience sample).

Regarding the links between the control variables and coparenting, there was no significant correlation between the number of study years, the number of children, the father’s work hours, and any of the coparenting dimensions. On the other hand, the wife’s number of work hours was negatively correlated with endorsement of the partner’s parenting by the father ($r = -0.185, p = 0.040$). Age was also negatively correlated with coparenting closeness ($r = -0.209, p = 0.020$) and with coparenting support ($r = -0.285, p < 0.001$).

There were several links between control variables and motivations: item 1 (“I did not have a choice for economic

reasons”) was positively correlated with the number of children ($r = 0.208, p = 0.021$); item 5 (“In my domain, reducing work hours is difficult because of work constraints”) was positively correlated with age ($r = 0.230, p = 0.011$), number of children ($r = 0.179, p = 0.048$), and number of work hours ($r = 0.405, p < 0.001$) and negatively correlated with the wife’s number of work hours ($r = -0.274, p = 0.002$). Item 7 (“I felt that my close relatives would judge me negatively if I had reduced my work hours to take care of my child”) was positively correlated with the number of study years ($r = 0.193, p = 0.032$) and number of children ($r = 0.193, p = 0.032$).

Correlations between motivations for role distribution and coparenting are provided in **Table 3**.

MRD item 3 (“It was evident that this is how I wanted things to be”) was positively and significantly correlated with coparental agreement and endorsement of the partner’s parenting; item 4 (“I would have preferred something else, but social pressure made us adopt this kind of sharing”) was negatively correlated with the dimensions of coparental agreement, coparental support, and endorsement of the partner’s parenting, whereas it was positively correlated with exposure to conflict and coparental undermining; and item 8 (“I felt that my close relatives would judge me negatively if I had not reduced my work hours to take care of my child”) was negatively correlated with coparenting closeness and positively correlated with exposure to conflict. These correlations were all coherent: item 3 related to voluntary choice was positively correlated with a functional dimension of coparenting, whereas the two items related to a felt constraint or social pressure (items 4 and 8) were negatively correlated with functional dimensions of coparenting and positively correlated with dysfunctional dimensions of coparenting.

Motivations as Predictors of Coparenting

Following the analysis of the correlations, items 3, 4, and 8 of the MRD were selected for GLM analyses. Results of the multivariate GLM performed on the six coparenting dimensions showed first, that age is the only predictor of all coparenting dimensions taken together, $F(6, 109) = 2.759, p = 0.016$. Parameter estimates (see **Table 4**), on the other hand, showed several links between the predictors and separate dimensions of coparenting. Age was a negative predictor of coparenting closeness, support, and endorsement of the partner’s parenting.

Evidence was a positive predictor of coparenting agreement and of endorsement of the partner’s parenting; social pressure was a positive predictor of coparenting undermining. None of the other variables (work hours, wife/partner work hours, number of study years, number of children, work constraints, and expectations by close relatives) were predictors of any of the coparenting dimensions.

DISCUSSION

The aim of this study was to assess the extent to which motivations and expectations of fathers about role distribution were predictive of the coparenting relationship that they report to have with the mother. Our results show that having chosen

TABLE 2 | Descriptive statistics for motivations for role distribution and for coparenting ($N = 123$).

Variable	<i>M</i>	<i>SD</i>	<i>Min.</i>	<i>Max.</i>
<i>Motivations for role distribution</i>				
Economic reasons	3.15	1.28	1	5
Practical reasons	3.28	1.20	1	5
Evidence	3.22	1.23	1	5
Social pressure	2.04	1.25	1	5
Work constraint	2.67	1.49	1	5
Employer judgment	2.00	1.24	1	5
Close relatives judge reduction in work hours as negative	1.53	0.89	1	5
Close relatives judge no reduction in work hours as negative	1.85	1.19	1	5
<i>Coparenting Relationship Scale</i>				
Agreement	4.62	1.15	1.50	6.00
Closeness	3.85	1.18	1.00	6.00
Exposure to conflict	1.37	1.12	0.00	6.00
Support	4.07	1.51	0.00	6.00
Undermining	0.82	0.99	0.00	6.00
Endorsement of partner’s parenting	4.69	1.11	1.29	6.00

min, minimum; max, maximum.

TABLE 3 | Pearson two-tailed correlations between role distribution and coparenting ($N = 123$).

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. MRD economic reasons	—												
2. MRD practical reasons	0.297**	—											
3. MRD evidence	-0.137	-0.197*	—										
4. MRD Social pressure	0.155	0.183*	-0.343***	—									
5. MRD Work constraints	-0.029	0.023	-0.105	0.073	—								
6. MRD Employer judgment	-0.073	0.121	-0.043	0.281**	0.434***	—							
7. MRD close relatives judge reduction in work hours as negative	-0.072	0.046	-0.115	0.179*	0.206*	0.522***	—						
8. MRD Close relatives judge no reduction in work hours as negative	0.064	0.019	-0.128	0.290**	0.036	0.206*	0.409***	—					
9. CRS agreement	-0.175	-0.012	0.251**	-0.288**	-0.020	0.049	0.098	-0.134	—				
10. CRS closeness	-0.153	-0.054	0.143	-0.071	-0.065	0.008	-0.021	-0.187*	0.559***	—			
11. CRS exposure conflict	0.046	-0.073	-0.094	0.196*	0.088	0.083	-0.002	0.180*	-0.584***	-0.430***	—		
12. CRS support	-0.144	-0.075	0.088	-0.189*	-0.127	-0.053	-0.066	-0.106	0.601***	0.660***	-0.551***	—	
13. CRS undermining	0.054	-0.095	-0.132	0.247**	0.096	0.086	-0.007	0.106	-0.666***	-0.424***	0.705***	-0.590***	—
14. CRS endorsement	-0.129	-0.024	0.181*	-0.179*	-0.033	0.026	0.046	-0.088	0.596***	0.561***	-0.418***	0.676***	-0.486***

MRD, Motivations for Role Distribution; CRS, Coparenting Relationship Scale.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

a specific role as evident, that is, in line with the father's will, is predictive of better agreement in coparenting and greater endorsement of the partner's parenting. In contrast, having chosen a role because of social pressure (whether effective or perceived as such) is linked with more undermining behaviors, that is, the feeling of being more at ease with the children when the mother is not present and the report of more negative behaviors made by the mothers in the coparenting interactions.

Several variables related to objective stressors were also considered, such as the number of work hours, the number of wife/partner work hours, and the number of children. These variables have been shown to be linked with the burden felt in the imbalance in work-family duties (Allen et al., 2013) and may thus indirectly affect the coparental relationship, in particular through a spillover effect. However, none of these variables were linked with coparenting. It is particularly interesting to note that neither the work rate of the fathers nor the work rate of the mothers reported by the fathers is predictive of coparenting. In most studies, paternal engagement has indeed been assessed in terms of time distribution; several meta-analyses have shown that the number of work hours is positively related to work-family conflicts (Byron, 2005; Ng and Feldman, 2008), and so we could expect it to have consequences on coparenting as well, which was not the case. Our results are in line with those of studies showing that the perception of stress rather than the actual workload may generate work-family conflicts (Perry-Jenkins et al., 2000). Alternatively, our results may also indicate that the processes that explain work-family conflicts and within-family conflicts related to work (coparenting difficulties fall into the domain of within-family difficulties) are not completely equivalent. However, further studies are needed to test these possible differences.

Not only is the number of work hours unrelated to coparenting, but there is also no correlation between the number of work hours and any of the motivational items. This finding suggests that there is no linear association between the amount of time at work and the feeling of being constrained. One of the reasons for this absence of a link may be the variety in fathers' expectations: not all fathers want to be the breadwinner of the family (to conform with the traditional role), but not all fathers want to be engaged in family work (as the zeitgeist could push them to do). Both a father dedicated to work and a father engaged in family life may feel constrained by social expectations; some fathers working full time may feel forced to do so, and others working part time and engaged in family duties may have the same feeling. This may reflect individual differences, as well as the ambivalence in contemporaneous social demands, according to which one should be at the same time a successful worker and an efficient caregiver—the negative consequences of which have been highlighted in mothers (Borelli et al., 2017). On the one hand, fathers may be willing to engage themselves more in family life, but they may have to face negative opinions from their social network (they may be presumed to be unable to get a paid job, or be unable to take care of children, or even be harmful to them; Rochlen et al., 2010). To overcome these criticisms, some fathers report rebuilding their masculine identity by incorporating feminine qualities (such as caregiving) in the definition of being masculine (caregiving is seen as an alternate way to provide resources to the family; Lee and Lee, 2018). In our own studies, we have found that when fathers endorse feminine traits (being affectionate), coparenting interactions are of higher quality (Favez and Frascarolo, 2020; Favez et al., 2021a). On the other hand, some fathers may still be more at ease with the traditional role of breadwinner, but in this case, they fail to meet the expectations of the mothers about paternal engagement

TABLE 4 | Parameter estimates of the effects of control variables and role distribution on coparenting ($N = 123$).

Parameter	CRS agreement				CRS closeness				CRS exposure to conflict			
	<i>B</i>	<i>SE</i>	95% CI		<i>B</i>	<i>SE</i>	95% CI		<i>B</i>	<i>SE</i>	95% CI	
			<i>LL, UL</i>	<i>p</i>			<i>LL, UL</i>	<i>p</i>			<i>LL, UL</i>	<i>p</i>
Intercept	5.155	0.989	3.044, 6.995	0.001	5.409	1.034	3.456, 7.435	0.001	1.091	0.950	−0.846, 2.958	0.258
Work hours	0.004	0.007	−0.009, 0.017	0.581	0.003	0.008	−0.013, 0.018	0.671	−0.003	0.007	−0.016, 0.012	0.723
Wife/partner work hours	−0.004	0.004	−0.011, 0.003	0.260	−0.003	0.004	−0.010, 0.004	0.352	0.002	0.004	−0.007, 0.010	0.704
Age	−0.018	0.015	−0.047, 0.010	0.232	−0.038	0.016	−0.068, −0.007	0.018	0.000	0.014	−0.029, 0.027	0.994
Number of study years	0.007	0.028	−0.052, 0.062	0.814	−0.008	0.025	−0.061, 0.038	0.751	−0.007	0.032	−0.070, 0.056	0.837
Number of children	−0.038	0.131	−0.275, 0.245	0.744	−0.087	0.139	−0.408, 0.145	0.506	0.067	0.118	−0.162, 0.324	0.564
MRD Evidence	0.187	0.090	0.009, 0.373	0.038	0.153	0.091	−0.024, 0.329	0.098	−0.027	0.082	−0.199, 0.133	0.748
MRD Social pressure	−0.184	0.098	−0.372, 0.005	0.061	0.036	0.096	−0.140, 0.232	0.741	0.126	0.085	−0.041, 0.296	0.139
MRD Close relatives judge no reduction in work hours as negative	−0.040	0.105	−0.240, 0.174	0.697	−0.180	0.093	−0.351, 0.008	0.058	0.114	0.093	−0.071, 0.286	0.228
Parameter	CRS support				CRS undermining				CRS endorsement			
	<i>B</i>	<i>SE</i>	95% CI		<i>B</i>	<i>SE</i>	95% CI		<i>B</i>	<i>SE</i>	95% CI	
			<i>LL, UL</i>	<i>p</i>			<i>LL, UL</i>	<i>p</i>			<i>LL, UL</i>	<i>p</i>
Intercept	6.324	1.358	3.531, 8.884	0.001	0.260	0.819	−1.233, 2.117	0.741	5.751	0.932	3.969, 7.681	0.001
Work hours	0.007	0.011	−0.014, 0.029	0.556	0.000	0.006	−0.012, 0.011	0.944	0.006	0.008	−0.009, 0.022	0.489
Wife/partner work hours	0.000	0.005	−0.010, 0.011	0.979	−0.002	0.004	−0.010, 0.006	0.672	−0.008	0.004	−0.015, 0.000	0.051
Age	−0.062	0.018	−0.097, −0.025	0.004	0.021	0.011	−0.001, 0.042	0.067	−0.033	0.013	−0.058, −0.005	0.025
Number of study years	0.010	0.037	−0.062, 0.083	0.795	−0.010	0.029	−0.070, 0.044	0.747	0.009	0.026	−0.045, 0.064	0.723
Number of children	−0.081	0.161	−0.442, 0.210	0.593	−0.119	0.091	−0.298, 0.061	0.196	−0.080	0.128	−0.345, 0.168	0.500
MRD Evidence	0.063	0.119	−0.166, 0.300	0.601	−0.056	0.082	−0.236, 0.087	0.514	0.167	0.078	0.009, 0.322	0.034
MRD Social pressure	−0.177	0.132	−0.422, 0.101	0.187	0.169	0.074	0.016, 0.313	0.030	−0.085	0.090	−0.252, 0.096	0.347
MRD Close relatives judge no reduction in work hours as negative	−0.083	0.124	−0.327, 0.154	0.513	0.047	0.085	−0.118, 0.207	0.603	−0.020	0.075	−0.170, 0.124	0.762

These parameters are bootstrap estimates ($n = 1,000$ samples).

MRD, Motivations for Role Distribution; CRS, Coparenting Relationship Scale; CI, confidence interval; LL, lower limit; UL, upper limit.

Boldface: p significant below the threshold of 0.05.

(Fox et al., 2000). The variety of expectations in fathers may be a sign of social change toward roles that are less determined by biological sex and more related to an individual's wishes and desires, or to personality factors such as masculine and feminine traits (Donnelly and Twenge, 2017). However, this process may be especially slow to take hold in Switzerland, a country in which traditional role distribution is still strongly predominant and structural support of families limited in comparison with that of other European countries (Bonoli, 2007; Levy and Widmer, 2013). As a consequence, it is difficult for mothers to depart from their role as primary housekeeper and caretaker, and for fathers to diminish their investment in work in order to be more available for family life.

The feeling of being constrained may be linked with a sense of inequity that will negatively affect the coparenting dynamic, as the father may have the feeling of doing a lot and not receiving his share (DeMaris and Mahoney, 2017). This explanation is speculative, however, as we did not assess the feeling of inequity in our study and therefore cannot verify the accuracy of this process. On the other hand, a feeling of evidence in the way roles were distributed is linked to coparental agreement and to the endorsement of the partner's parenting. This positive link may be the mere consequence of a distribution that met the father's will; however, it would be interesting to investigate the extent to which a general positive attitude may explain both the feeling of evidence (fathers are happy with what they have) and cohesion in the coparental relationship. This second option would be in line with the role-enhancement perspective according to which positive affect and state of mind is an antecedent of mutual enrichment between work and family domains (Michel et al., 2011a; Lapierre et al., 2018). Further studies would be needed to test this hypothesis, as well as to assess the links between the feeling of evidence and satisfaction with work.

Whereas the number of work hours is not related to coparenting, another sociodemographic variable is a strong predictor of the relation between the parents: the age of the fathers. The older the father is, the less he reports coparenting closeness with the mother, coparenting support, and endorsement of the mother's parenting. The influence of age reminds us of the importance of considering the life cycle of families. In our study, we used the age of the father as a predictor, which is strongly positively correlated with the ages of the older child and of the younger child of the family (including all three variables would have inflated the results related to age). Coparenting does not have the same meaning and the same aim for the different developmental stages of the children; when the child is very young, support is all the more important at an instrumental level, for example. Although there is no specific theory on the life trajectory of coparenting, studies have shown that some positive dimensions related to cohesion are less active as the child grows (Favez et al., 2015): there is less and less promotion of family integrity, for example. This observation may be explained by the necessity for the family to be progressively more open in order to allow the child to develop relationships with family outsiders and not to feel stuck within the family, this being similar to the "enmeshed" configuration described in some

problematic families (Minuchin, 1974). Interestingly, an effect of life cycle has also been found in work-family conflicts, which decrease as individuals age (Hill et al., 2014).

Our study has several limitations, the first of these related to the sample: The sample size is small, and we had to reduce it further because the family structures were linked to coparenting. We have thus focused on the most represented arrangement (86.1%), that is, a heterosexual biparental house with the biological children of the couples. Moreover, it was a convenience sample, and so it is not representative of the general population. The participants were individuals, not couples, the reason being that the main study was designed as an anonymous survey that targeted any and all parents interested in participating. It is thus possible that both partners in a couple completed the survey, but we had no means of knowing whether this was the case. It will be necessary to collect such data about motivations in role distribution in both partners in order to assess possible incongruencies or contradictions between their reports. This study was in fact an ancillary study, congruent with the aim of the main study, but not its main aim. For this reason, we were not able to enroll couples. Second, there are limitations related to the instruments: The questionnaire that we used to assess motivation for role distribution was created *ad hoc* for this study, as no questionnaire on this topic was available in the literature; more data are thus necessary to test its validity. Moreover, the division of labor dimension of the CRS, which is closely related to role distribution, was not included in the study due to its low internal consistency. Future studies should include questionnaires specifically dedicated to division of labor, such as the "Who does what" questionnaire (Cowan and Cowan, 1990). Finally, it would have been interesting to include an assessment of the couple relationship at a romantic (or marital) level, as the romantic and coparental facets of the couple relationship are deeply intertwined (see, for example, Fagan and Lee, 2014); dissatisfaction with the marital relationship may also explain a less cohesive coparental relationship.

Despite these limitations, and considering that the aim of this study was mainly exploratory, it has nevertheless shown that fathers may have different motivations and expectations about role distribution, and when their expectations are not met, this may have an impact on the coparental relationship. Both parents' expectations and needs are thus to be considered, as this will strengthen parental alliance and coparental cohesion, which will in turn also be beneficial to mothers. In Europe, social policies vary greatly between countries, for example, regarding access to and duration of paternity leave; fathers should benefit from the same support and information as mothers (the vast majority of resources available for new parents being focused on the child and mothers only; Lee et al., 2020) and their expectations should be heard, as this will contribute to the well-being of the whole family.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Ethical Committee of the State of Vaud. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

NF designed and co-conducted the study, wrote the main parts of the manuscript, and made the statistical analyses along with HT. AM participated in designing the study, collected the data, and built the database. MB designed and co-conducted the study. HT made the statistical analyses and co-wrote parts of the

manuscript. All authors contributed to the article and approved the submitted version.

FUNDING

This study was conducted without external funding.

ACKNOWLEDGMENTS

This study was part of the international project led by the International Investigation of Parental Burnout (IIPB) Consortium (<https://www.burnoutparental.com/international-consortium>).

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Fathers' Sensitivity in Infancy and Externalizing Problems in Middle Childhood: The Role of Coparenting

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OPEN ACCESS

Edited by:

Loredana Lucarelli,
University of Cagliari, Italy

Reviewed by:

Audrey-Ann Deneault,
University of Calgary, Canada
Gabrielle Coppola,
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Specialty section:

This article was submitted to
Gender, Sex and Sexualities,
a section of the journal
Frontiers in Psychology

Received: 30 October 2021

Accepted: 04 January 2022

Published: 08 February 2022

Citation:

Jacobvitz D, Aviles AI, Aquino GA,
Tian Z, Zhang S and Hazen N (2022)
Fathers' Sensitivity in Infancy
and Externalizing Problems in Middle
Childhood: The Role of Coparenting.
Front. Psychol. 13:805188.
doi: 10.3389/fpsyg.2022.805188

The present study examined the role of father sensitivity and couple coparenting quality in the first 2 years of life in relation to the development of externalizing behavior problems in middle childhood, focusing on the unique role of fathers. In this study, 125 mothers, fathers, and their first-born children were followed from 8 months to age 7 years. Paternal sensitivity was rated when infants were 8 and 24 months old. Fathers were videotaped at home playing, feeding, and changing their 8-month-old infants' clothes. They also were videotaped in a lab playing with their 24-month-olds and solving a variety of challenging tasks. At 24 months, competitive coparenting was assessed via videotaped triadic family interactions at home in which families participated in a variety of tasks (i.e., clothes change, eating a snack together and solving tasks). Teachers rated externalizing behavior problems when the children were age 7. Continuity in paternal sensitivity was documented from 8 to 24 months, and paternal sensitivity at 8 months predicted externalizing behavior in middle childhood through father sensitivity at 24 months. Moreover, paternal sensitivity at 8 months predicted competitive coparenting which, in turn, forecast externalizing behavior problems in middle childhood, even after controlling for maternal sensitivity at 8 and 24 months. These findings highlight the unique role of paternal caregiving quality during the first year of life on couple coparenting and children's subsequent development of externalizing problems and have implications for creating effective interventions to prevent children from developing externalizing disorders.

Keywords: coparenting, family systems, fathers, caregiving, externalizing symptoms

INTRODUCTION

Externalizing behaviors in early and middle childhood include temper tantrums, defiant behavior, impulsivity, social maladjustment, and reduced tolerance for frustration (Murphy et al., 2017a). Further, these behavior problems increase the likelihood of alcoholism, psychological disorders, drug abuse, and maladaptive relationships during adolescence and adulthood (Masten et al., 2005).

Identifying early antecedents of externalizing behaviors is important to help prevent these maladaptive behaviors from developing. Both maternal (Lorber and Egeland, 2009) and paternal (Rodrigues et al., 2021) sensitivity during the early years, defined as accurately perceiving and appropriately responding to the child's emotional and cognitive signals (Ainsworth et al., 1978), forecast fewer later externalizing symptoms in childhood. Yet, research on father-infant interaction and its relation to child outcomes still lags far behind research on the effects of mother-infant interaction. One explanation for the lack of systematic and rigorous research on paternal caregiving

is that the focus on fathers as economic providers has led to the view that they do not spend enough time with their children to affect their lives emotionally (Cabrera et al., 2018). There has been a surge in women's labor force participation since the 1970s. As the gender gap in the share of the work force held by men and women has narrowed, the amount of time fathers spend interacting with their infants has increased three- to six-fold in Western countries (Bakermans-Kranenburg et al., 2019). Thus, it is important to understand the lasting effects of paternal sensitive caregiving during the first 2 years of life on children's development.

Fathers' sensitive caregiving might reduce infants' risk for the later development of externalizing symptoms not only directly, but also indirectly, by affecting coparenting quality, which refers to the ways in which both parents work together to parent their child (McHale et al., 2001). Negative patterns of coparenting, particularly competitive coparenting in which parents undermine each other in front of the child have been linked to children's later externalizing behavior (Teubert and Pinquart, 2010; Murphy et al., 2016). Thus, the goal of the present study is to examine the role of paternal sensitivity and coparenting quality in the first 2 years of life in the development of children's externalizing behavior problems in middle childhood. We propose that the quality of care that fathers provide their infants at 8 months will relate to their development of externalizing problems in middle childhood through two pathways. (1) Fathers' sensitive care will be stable from 8 to 24 months, and fathers' sensitive caregiving at 24 months will predict lower child externalizing problems in middle childhood, and (2) Fathers' sensitive care at 8 months will be associated with coparenting quality, which will, in turn, forecast externalizing problems in middle childhood.

This study will be one of the first to examine stability of paternal caregiving over the first 2 years of life. There is evidence of stability in paternal care from middle childhood to adolescence (Bureau et al., 2017), but less is known about stability of paternal care over the first 2 years. Maternal sensitivity has been shown to be stable from 10 to 12 months (Behrens et al., 2012) and greater stability in maternal sensitivity has been found from 15 to 24 months than 6 to 24 months (Dallaire and Weinraub, 2005). This is likely because dyadic reciprocity increases substantially at 8 months, when infants are more able to contribute meaningfully to the give-and-receive exchange (Feldman, 2010). For example, infants begin to communicate by pointing and gesturing, and, when upset, they can seek proximity to the caregiver by vocalizing and crawling to the parent (Jacobvitz et al., 1991). Based on these findings, we assessed paternal sensitivity when infants were 8 months of age to examine stability of paternal care from 8 to 24 months and the role of father sensitivity in coparenting quality and children's later behavior problems.

Father Sensitivity and Children's Externalizing Behavior

Fathers' sensitive interaction with their infants and young children has been theorized to play a unique role in the development of their children's emotion regulation (Paquette, 2004; Hazen et al., 2010), which is critical for reduction of children's externalizing behaviors. According to

Grossmann and Grossmann (2020), fathers tend to prioritize exploration and stimulating play, such as rough-and-tumble play, when they interact with their infants and toddlers. This play may become overstimulating or even frightening to these young children, so that fathers need to calm them. One study found that fathers who were more sensitive while engaging in highly stimulating and potentially frightening play with their 8-month-old infants, compared to those who were less sensitive during this type of play, were more likely to have children who were better regulated at 24 months (Hazen et al., 2010). Similarly, fathers' sensitive interaction with their toddlers during challenging, stimulating play was associated with their children's attachment security during middle childhood, adolescence, and early adulthood (Grossmann and Grossmann, 2020). Thus, it is possible that fathers who engage in challenging play with their young children and can sensitively comfort them when they become overstimulated or frightened, may be scaffolding their ability to regulate their impulses to engage in externalizing behaviors. In contrast, fathers who continue to engage in stimulating play when their young children become upset may further dysregulate their children and exacerbate their externalizing behaviors (Hazen et al., 2010).

Few studies have examined associations between paternal sensitivity with young children and children's later development of externalizing behavior. Two cross sectional studies with preschool children have shown that fathers' insensitive care is related to concurrent assessments of externalizing symptoms directly (DeKlyen et al., 1998), as well as indirectly, *via* the child's attachment relationship (Bureau et al., 2017). However, few studies are longitudinal, following children over time to ascertain the lasting effects of paternal sensitivity on their adjustment, and even fewer have assessed paternal sensitivity during the first 2 years of life. Specifically, Rodrigues et al. (2021) recently conducted a meta-analysis of the relation between either paternal sensitivity or father-child attachment security and children's externalizing behaviors or ADHD symptoms. Of the 14 published studies included in the meta-analysis, there were only three longitudinal studies examining relations between father sensitivity and children's externalizing behavior. Further, only one study assessed father sensitivity in children under the age of 3, and, in that study, all of the children had an alcoholic father (Eiden et al., 2007). Hence, little is known about how paternal sensitivity during infancy and toddlerhood might affect children's later development of externalizing symptoms in the general population. Since father sensitivity has been associated with externalizing behavior in older children, it is particularly important to identify whether and how insensitive father-infant interaction relates to children's later development of externalizing problems. This way, interventions can begin early, before insensitive father-child interactions become habitual and before infants can be negatively affected by insensitive care.

Father Caregiving and Competitive Coparenting

Low paternal sensitivity may also affect children's later development of externalizing problems by contributing to more competitive, undermining patterns of coparenting, which could,

in turn, promote the development of children's externalizing symptoms. Coparenting has been examined as the degree to which parents support or undermine each other's childrearing efforts while working together to care for their children (McConnell and Kerig, 2002). In cooperative coparenting, parents support and assist one another in advancing each other's parenting efforts. In contrast, competitive coparenting involves the parents undermining or criticizing their partners' parenting in the presence of their child, jockeying for control of the child, or trying to be the "favorite" parent (McHale et al., 2001).

According to family systems theory, subsystems within the family are interdependent (Minuchin, 1974; Jacobvitz et al., 1999); thus, the quality of dyadic parent-child interactions affects triadic mother-father-child family dynamics, including coparenting quality. The coparenting relationship has been shown to influence father sensitivity with infants at 3.5 months (Brown et al., 2010), but the contribution of paternal sensitivity to coparenting in the mother-father-child triad is less clear. Bernier et al. (2021) found that father-child play at age 4 that was characterized by harmonious communication and mutual cooperation and low emotional ambivalence predicted coparenting quality at age 6. Specifically, these parents engaged in more harmonious and positive exchanges, marked by greater agreement and fewer critical comments and competitive interactions about how to handle the child. These couples also displayed more enjoyment of their child. Further, the interaction of child-mother and child-father attachment security during the preschool years, which is known to be related to parenting sensitivity, significantly predicted the quality of the coparenting relationship (Bureau et al., 2021). Perhaps when fathers are more sensitive, their spouses are more supportive and less likely to undermine the father-child relationship. As a result, the parents may engage in more supportive coparenting, working together cooperatively rather than competitively in caring for their child. Indeed, mothers' support of fathers' coparenting decisions has been linked to more cooperative coparenting (Murphy et al., 2017b).

In contrast, mothers may be more critical and undermining of fathers who are insensitive with their child. When mothers are not confident that their spouses are involved and competent caregivers, they are more likely to engage in maternal gatekeeping, defined as maternal attitudes and actions that negatively affect the quality of fathers' relationship and involvement with their child (Allen and Hawkins, 1999). Maternal gatekeeping often reduces fathers' involvement in infant care, which further erodes fathers' caregiving competence (Altenburger et al., 2018). Indeed, mothers' discouragement and criticism of fathers' involvement in infant care predicts parents' reports of poorer coparenting quality (Schoppe-Sullivan et al., 2008).

Competitive Coparenting and Children's Externalizing Problems

Numerous studies have found competitive coparenting to be a robust predictor of children's externalizing problems (Schoppe et al., 2001; Teubert and Pinquart, 2010; Murphy

et al., 2016). Competitive coparenting is characterized by parents putting the child in the middle of their coparenting conflicts by undermining each other in front of the child, jockeying for control of the child, and trying to get the child to take sides (McHale et al., 2001). Thus, it necessarily involves triangulation of the child such that the child is put in a position of having to choose between their parents. A meta-analysis of associations between coparenting quality and children's externalizing behaviors (Teubert and Pinquart, 2010) indicated that children's externalizing behaviors were positively associated with competitive coparenting (triangulation of the child) and coparenting conflict (parental disagreements about coparenting), and negatively associated with cooperative coparenting. Negative types of coparenting, including competitive coparenting, conflictual coparenting, and low levels of cooperative coparenting often co-occur, making it difficult to determine which of these aspects of negative coparenting contribute to the development of children's externalizing behaviors (Margolin et al., 2001). It may be that children model the high levels of family conflict they observe during coparenting conflict, which then contributes to their later development of externalizing behaviors (Teubert and Pinquart, 2010). Alternatively, the emotional security hypothesis (Davies and Martin, 2013) postulates that triangulation of the child, the key characteristic of competitive coparenting, may be particularly emotionally threatening to the child, resulting in increased emotional dysregulation, impulsivity, and attention problems. This may, in turn, contribute to the later development of aggression and externalizing problems (Machado and Mosmann, 2020). This has been confirmed in recent studies that found strong associations between competitive coparenting, characterized by triangulation of the child, and children's later development of externalizing problems from early to middle childhood (Murphy et al., 2016) and from middle childhood to adolescence (Riina and McHale, 2014; Machado and Mosmann, 2020). Moreover, when competitive coparenting, coparenting conflict, negative affect in coparenting, and low cooperative coparenting were simultaneously entered into a model to predict children's development of externalizing symptoms in middle childhood, only competitive coparenting remained as a significant predictor of externalizing symptoms (Murphy et al., 2016). Thus, in the current study, we focus particularly on competitive coparenting as a consequence of fathers' less sensitive caregiving and as a predictor of children's later externalizing symptoms.

The Current Study

The goal of the present study is to examine multiple pathways from paternal sensitivity in infancy to externalizing behavior in middle childhood. We hypothesize that: (1) father sensitivity will be stable from 8 to 24 months, and father sensitivity at 24 months will predict children's externalizing symptoms at 7 years; and (2) father sensitivity at 8 months will predict competitive coparenting at 24 months, and competitive coparenting will, in turn, predict children's externalizing symptoms at age 7. That is, the relation of fathers' sensitivity at 8 months to externalizing behavior in middle childhood will be mediated by fathers' continued sensitivity at 24 months and by couples' competitive coparenting at 24 months.

In our model, we controlled for fathers' age, education, and family income, since older fathers, those with more education, and those from higher socioeconomic backgrounds tend to engage in more sensitive care with their infants (e.g., Rockville, 2000). We controlled for paternal involvement, since the amount of time fathers spend interacting with their infants has been found to be associated with both father sensitivity and children's later outcomes [National Institute of Child Health and Human Development (NICHD), 2000]. We also controlled for paternal depression, since parental depression has been associated with lower quality caregiving (e.g., Bronte-Tinkew et al., 2007). In addition, we controlled for child sex because boys are more likely to show externalizing behaviors (Bongers et al., 2004). We also controlled for infant temperament, since it has been associated with parenting quality (Bates et al., 2012), externalizing behaviors (Bradley and Corwyn, 2008), and negative parenting behaviors, such as undermining (Cook et al., 2009). We also controlled for marital satisfaction, since it has been associated with coparenting quality (Schoppe-Sullivan et al., 2004; Christopher et al., 2015). Finally, we controlled for maternal sensitivity, since mother and father sensitivity have been found to be related in previous studies (Barnett et al., 2008).

METHODS

Participants

Participants were part of a longitudinal study following 125 families over the transition to first-time parenthood, from shortly before they expected their first child until the child was 7 years old (Jacobvitz et al., 2004). Couples were recruited during pregnancy through childbirth classes, public service radio announcements, and flyers distributed at local maternity stores and obstetricians' offices in a large southwestern United States city. To be eligible for the study, all couples had to be either married (91%) or living together at the start of the study and expecting their first child. Participants were primarily middle class but varied in income level. One-third were at or below poverty level and two-thirds were from middle class backgrounds based on the census data in the mid-1990s when the sample was recruited: 25.6% reported over \$60,000 in total family income, 26.4% reported \$45,001–\$60,000, 24.8% reported \$30,001–\$45,000, and 23.2% reported their total family income equal to or less than \$30,000, which was considered below poverty level. The mean age of mothers was 29.48 ($SD = 4.73$), with a range from 16 to 41 years old and the mean age of fathers was 31.66 ($SD = 6.17$), ranging from 19 to 51 years old. Participants were predominantly White (86% of fathers and 83% of mothers). Other participants identified themselves as Hispanic (10% of fathers and 7% of mothers), and African American (4% of fathers and 2% of mothers). The remaining 12 mothers chose "Other," and two of them wrote in an ethnicity (Middle Eastern and Indian). Each parent reported their highest level of education. Participants were generally well-educated with 9% of the mothers and 8% of the fathers reporting their highest education level was high school, 25% of the mothers and 34% of the fathers had some training beyond high school but did not graduate from college, 46% of the mothers and 38% of

the fathers earned a bachelor's degree, and 18% of the mothers and 17% of the fathers had a graduate or post college degree. All infants (41% female) were born full-term and none were admitted to the Neonatal Intensive Care Unit. Following each phase of data collection, families received compensation in the form of savings bonds, newsletters, and gifts for their child.

Data from 119 families included paternal sensitivity in infancy. 108 families remained when the children were 24 months, and teacher-reported data on children was available for 71 children when the children were 7 years old. Couples left the study due to moving away, divorce, being too busy to participate, or losing contact with the researchers. Fathers of families who remained in the study for all waves were older (Time 1 $M_{age} = 33.09$, $SD = 6.16$) than those who did not complete all waves of data collection [Time 1 $M_{age} = 30.04$, $SD = 6.12$; $t(121) = 2.75$, $p = 0.007$]; thus, we controlled for paternal age in the model. There were no other significant differences by attrition for any of the study variables or demographic variables (i.e., paternal education and family income).

Procedure

Data were collected in four waves: the first wave took place when couples were expecting their first child, the second wave took place when the child was 8 months old, the third wave at 24 months, and the fourth wave at 7 years of age. Mothers and fathers completed a background information survey to ascertain age, education and income during the first visit. At 8 months, mothers and fathers were independently observed at home playing with and feeding their infants. Mother and father order was counterbalanced. At this visit, mothers and fathers also reported how much time they spent with their infants and they completed a questionnaire that assessed depressive symptoms experienced in the previous week. When the children were 24 months old, mother, father, and child were videotaped at home interacting for 25-min across a series of triadic interaction tasks. During this visit, parents also completed a questionnaire to examine their marital satisfaction. When children were 7 years of age, the children's teachers completed a questionnaire to assess externalizing symptoms.

Measures

Caregiver Sensitivity (8 Months)

When infants were 8 months old, mothers and fathers were individually videotaped at home during 30-min interactions as they changed their children's clothes, fed them, and engaged in free-play. Parents were asked to play with their child as they normally would. Mother-infant and father-infant interactions were later coded using the Infant Caregiving Scales (ICS; Hazen, 1997). The ICS consists of 90 items derived from descriptions of caregiving that are provided in the instructions for rating Ainsworth's three global scales for assessing sensitivity vs. insensitivity, acceptance vs. rejection, and cooperation vs. interference (Ainsworth et al., 1978). The ICS was developed in order to assess sensitive caregiving, as conceptualized by Ainsworth, using a more robust scale consisting of multiple items rather than a single global sensitivity item. Multi-item scales are considered to provide better content validity for assessing

abstract constructs compared to single-item scales, as they describe the construct in multiple ways (McIver and Carmines, 1981). They are also more sensitive, having more points of discrimination, and they provide a means of assessing internal consistency of the scale. The sensitivity scale for the ICS, as well as other caregiving scales, including hostile, disengaged, interfering, and role-reversed caregiving, were developed using a criterion sort method (Waters and Deane, 1985), in which expert judges rated each of the 90 items on the ICS based on the extent to which they were diagnostic of each construct. Only the sensitivity scale, which examined the extent to which parents responded promptly and appropriately to their infants' wishes, was used in the present study. The sensitivity scale consisted of 17 items that the criterion sorters agreed were highly diagnostic of sensitivity or insensitivity (reverse scored). Example items include: "Parent responds to baby when he or she cries," "Parent's actions are finely tuned to the baby's wishes," "Parent frequently misinterprets baby's cues; does not seem to understand baby's nonverbal communication" (reverse scored), and "Parent's responses are contingent with child's cues."

Five coders were trained by observing and coding 14% of the study videotapes as a group with the guidance of the developer of the ICS until they came to a consensus. Then the five trained coders rated mothers and fathers on all ICS items, and 86% of the videotapes were then double coded for reliability. Seven tapes that demonstrated low inter-rater reliability were also rated by a third trained coder. Inter-rater reliability across all items was 0.64. Cronbach's alpha for the sensitivity subscale was 0.94. Scores averaged across coders were used for data analysis. Construct validity for the sensitivity scale of the ICS was obtained by correlating average scores for ICS sensitivity with the global single-item sensitivity ratings previously obtained from another team of raters who previously rated the same videotapes using the Ainsworth scales; $r(113) = 0.81, p < 0.001$. Evidence for concurrent and criterion validity was obtained in later published studies that found that: (1) parents with secure working models of attachment had higher scores on ICS sensitivity than those with insecure working models (McFarland et al., 2012; Poulsen et al., 2019), (2) more positive and less negative affect in prenatal marital interactions predicted mothers' and fathers' ICS sensitivity with their infant at 8 months (Poulsen et al., 2019), and (3) parents' lower ICS sensitivity at 8 months predicted their children's greater emotional dysregulation as toddlers (Hazen et al., 2010).

Caregiver Sensitivity (24 Months)

At 24 months, mothers, fathers, and children came to the university laboratory. Mother-child and father-child interactions were independently videotaped during 20 min of free play and 5 min of clean-up. Next, parent-child dyads completed four problem-solving tasks. The parent was told to let the child first work on the problem independently, then to give "any help you think he/she needs." The first two problems were easy for the child and involved removing a lure from a space between two closely spaced wooden panels or a tube using a stick. The third task was more difficult. The child was asked to put bristle blocks end to end to remove a lure from a long tube. The final task was beyond the child's ability, requiring the parent to help the child.

This task required the child to weigh down one end of a lever with a block to raise the other end of the level whereby a treat could be reached through a hole in a Plexiglas box. The order in which mothers and fathers interacted with their toddlers was randomized and counterbalanced.

The Infant Caregiving Scales used to code parent interaction with infants was adapted to use for parent interactions with toddlers, creating the 90-item Toddler Caregiving Scales (TCS). A few items were changed so that they were age-appropriate for toddlers (for example, items referring to infant feeding were changed to apply to parent-toddler interaction in teaching tasks), but most were the same except that the word "baby" was replaced by "toddler" or "child." Items in the toddler sensitivity scale did not include any of the reworded items, but instead included 14 of the original 17 items that comprised the infant sensitivity scale; three were removed because they reduced the overall coefficient alpha. The removed items were: "Parent's vocalizations to the child are overstimulating (reverse coded)," "Parent provides a voice for child's wishes," and "Parent tries to empower and affirm child's wishes." These items may be less developmentally appropriate measures of parenting sensitivity with toddlers, especially the second two, which involve the parent speaking for the child. In toddlerhood, sensitive parents seem more likely to speak *to* the child rather than to speak *for* the child.

All 90 items on the TCS were coded by trained coders and 70% of the videotapes were double-coded. Inter-rater reliability was 0.71 for mother sensitivity and 0.72 for father sensitivity. Cronbach's alpha was 0.94 for mother sensitivity and 0.93 for father sensitivity. At both 8 and 24 months, the average of both coders' ratings were used for tapes rated by more than one coder. A different set of coders rated parent-child interactions at 8 months and 24 months and coders had no knowledge of scores on any of the other measures.

Coparenting Behavior

When children were 24 months old, families (i.e., mother, father, and child) were videotaped in their homes engaging in several triadic interaction tasks. Triadic interactions lasted a total of 25 min. Parents were tasked with a card sorting activity while concurrently working to prepare a snack and change their child's clothes. These tasks were designed to examine coparenting interactions that forced parents to work on an adult task while simultaneously caring for their child. Parents had 25 min to complete all of the tasks in any order they choose. The time constraint was intended to put mild pressure on the parents. If parents completed the tasks early, they were asked to engage their child in a challenging peg-sorting task.

The interactions were later coded using the Coparenting and Family Rating Scale (CFRS; McHale et al., 2001), informed by structural family theory (Minuchin, 1974). Concurrent, predictive and discriminant validity and test-retest reliability of the scale are well established by McHale et al. (2001) (e.g., McHale et al., 2001; McConnell and Kerig, 2002). Only the Competitive Coparenting scale was used in the present study. Competitive coparenting is defined as the degree to which parents put the child in the middle of their disagreements or undermine or contradict each other in the presence of the child often with the purpose of gaining attention or favoritism from the child. A score

of five indicates that parents demonstrated excessive levels of competitive behaviors and no self-awareness. Alternatively, a score of 1 indicated that parents did not demonstrate competitive or undermining behaviors. In addition, if coparenting was nonexistent, for example, if one parent made all the parenting decisions and the other parent went along with them, then a score of 1 was given. Two coders were trained independently and blind to all other data. For scores that differed by more than one point between the coders, the coding team decided on the final ratings. Intraclass correlation was 0.81.

Children's Externalizing Behaviors

When children were 7 years old, each of their teachers completed the Teacher's Report Form (TRF; Achenbach, 1991). The TRF is composed of 116 items that measure emotional and behavioral problems in the school setting. Teachers rated each item as 0 = "not true," 1 = "somewhat or sometimes true," or 2 = "very true or often true." The current study utilized the externalizing subscale on the TRF, which includes items assessing aggressive and rule-breaking behavior. Inter-rater reliability and test-retest reliability for the TRF are high, with intraclass correlations being in the .90s (Achenbach, 1991).

Control Variables

Fathers' Involvement in Infant Caregiving

At 8 months postpartum, mothers and fathers reported how much time each parent spent caring for their infant in a typical week. On a chart that covered a week, they independently identified how many hours each parent had spent caring for their child every day from 6 a.m. to 11 p.m. the prior week. To calculate fathers' share of childcare, mothers and fathers' scores were averaged and then the percent time that the father spent caring for the child was calculated based on the total number of hours in the week.

Paternal Depressive Symptoms

At 8 months postpartum, fathers completed the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). The CES-D is a 20-item self-report questionnaire in which

participants rate how often in the previous week they experienced the depressive symptoms in each statement. Sample items of this measure include, "I felt depressed" and "I thought my life had become a failure." Each item was rated on a 4-point Likert scale ranging from "Rarely or none of the time" to "Most or all of the time." Participants' total item scores were combined to represent the general depression that they experienced the previous week. The CES-D has established validity, adequate test-retest reliability, and high internal consistency (Radloff, 1977).

Marital Satisfaction

At 24 months postpartum, fathers completed the Marital Opinion Questionnaire (MOQ; Huston and Vangelisti, 1991). The MOQ encompasses two parts that examine mothers and fathers' relational happiness throughout the previous 2 months. In the first part, mothers and fathers rated ten bipolar adjectives (e.g., miserable-enjoyable, rewarding-disappointing) on a 7-point semantic differential scale. In the second part, mothers and fathers rated a single item that assessed their overall satisfaction with their marriage. This item was rated on a 7-point scale. When creating a marital satisfaction variable, adjective pairs (i.e., free-tied down and hard-easy) were excluded because they were not correlated with the other adjective pairs. The average of the remaining eight bipolar adjectives was calculated. Internal consistency of the eight adjectives was high for both mothers and fathers (from 0.90 to 0.94). Because the scores from the eight bipolar adjectives and the single item were highly correlated to each other (from 0.53 to 0.77), these scores were then averaged to constitute the marital satisfaction variable for each participant. According to Huston and Vangelisti (1991), the MOQ is highly correlated with similar established measures of marital satisfaction, such as the satisfaction subscale from Spanier's Dyadic Adjustment Scale (Spanier, 1976).

Infant Temperament

At 3 to 6 weeks postpartum, mothers completed the Infant Behavior Questionnaire (IBQ; Rothbart, 1981). The IBQ uses 87 items to measure infant temperament on the following six domains: infants' activity level, smiling and laughter,

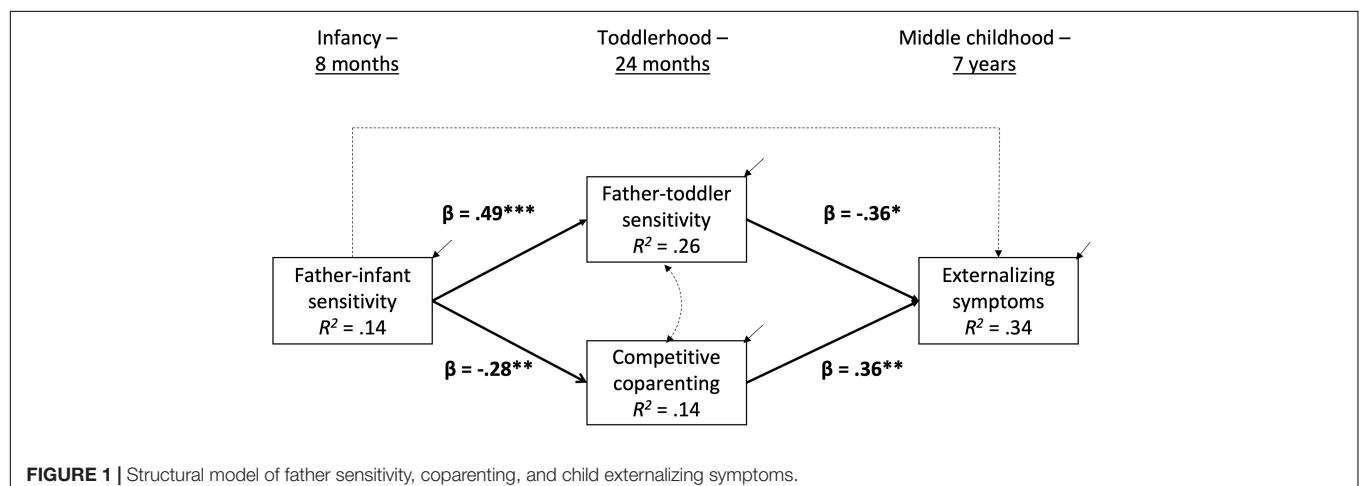


FIGURE 1 | Structural model of father sensitivity, coparenting, and child externalizing symptoms.

fear, distress to limitations, soothability, and duration of orienting. The frequency of behaviors for each domain was rated on a 7-point scale from 1 = never to 7 = always, with higher scores indicating higher reactivity. Smiling and laughter, activity level, and duration of orienting comprise the positive reactivity scales, whereas fear and distress to limitations comprise the negative reactivity scales. Following Rothbart (1986) suggestion, the current study utilizes a composite net negative reactivity scale that was created by subtracting the standardized positive reactivity scales from the standardized negative reactivity scales. We examined net negative reactivity, rather than using negative reactivity alone, because we assumed that the extent to which infant temperament would affect parental caregiving or children's later development of externalizing behavior would be a function of the child's temperament as a whole, such that the child's positive reactivity would mitigate the effects of their negative reactivity. The composite net negative reactivity measure had a Cronbach's alpha of 0.77. The reliability and validity of this scale is well established (Rothbart, 1986).

Family Income

When couples were expecting their first children, parents individually reported their education and age. They also reported family income at 8 months, 24 months, and 7 years. Mother and fathers' reported incomes were then averaged to create a composite family income variable.

RESULTS

Overview of Analyses

We conducted path analyses in a structural equation modeling framework using Mplus 7.4 (Muthén and Muthén, 1998-2012). All variables used met the requirements for normality; thus, we used ML estimation to analyze the models. We addressed the missing data from this longitudinal study through full-information maximum likelihood (FIML). This method allows all available data to contribute to parameter estimation but does not impute any missing values (Enders and Bandalos, 2001; Mueller and Hancock, 2018). The effects of paternal sensitivity with their infants were modeled on paternal sensitivity during toddlerhood and dyadic competitive coparenting (see **Figure 1**), which were then modeled on child externalizing problems. The effects of maternal sensitivity, paternal age, paternal depressive symptoms, family income, child sex, child temperament, division of childcare, parental education, and paternal marital satisfaction were all accounted for within the model. The model fit was acceptable: $\chi^2(32) = 39.56, p = 0.168$; RMSEA = 0.04 (0.00–0.09); CFI = 0.88; SRMR = 0.05.

Preliminary Analyses

Paternal sensitivity was significantly linked across time ($r = 0.49, p < 0.001$), such that fathers who were more sensitive with their infants at 8 months were also more sensitive with their toddlers at 24 months. Paternal sensitivity at 8 months (but not 24 months) was also significantly related to lower levels

of competitive coparenting in the triadic family interactions at 24 months ($r = -0.22, p = 0.039$). Higher levels of paternal sensitivity at 24 months (but not 8 months) were also associated with lower levels of teacher-reported externalizing behaviors when children were school-aged ($r = -0.30, p = 0.025$). Finally, higher levels of competitive coparenting were related to higher levels of externalizing behaviors ($r = 0.41, p = 0.002$). See **Table 1** for all correlations and descriptive statistics.

Model of Paternal Sensitivity, Coparenting, and Child Externalizing Symptoms

In the full structural equation model shown in **Figure 1**, paternal sensitivity during infancy had a direct effect on parental sensitivity and coparenting quality in toddlerhood, such that fathers who were more sensitive with their infants were more likely to be sensitive with their toddlers ($\beta = 0.49, p < 0.001$) and exhibited lower levels of competitive coparenting ($\beta = -0.28, p = 0.005$).

Paternal sensitivity during infancy did not have a direct effect on child externalizing symptoms at age 7 ($\beta = 0.07, p = 0.57$). However, paternal sensitivity during toddlerhood did have a direct effect on child externalizing symptoms ($\beta = -0.36, p = 0.019$); children whose fathers had been more sensitive exhibited fewer externalizing behaviors. Competitive coparenting during toddlerhood was also significantly linked to later externalizing behaviors ($\beta = 0.36, p = 0.003$); parents who engaged in more competitive coparenting were more likely to have a child who later demonstrated externalizing behaviors.

Indirect Effects

Indirect effects were calculated using the delta method, which utilizes the standard errors of each pathway and the covariance between the two (Bollen, 1989). Father-toddler sensitivity had an indirect effect on the relation between father-infant sensitivity and child externalizing behaviors ($\beta = -0.17, p = 0.031$). Competitive coparenting also had a significant indirect effect on the relation between father-infant sensitivity and child externalizing behaviors ($\beta = -0.10, p = 0.049$).

Covariates

All covariates (concurrent maternal sensitivity, fathers' marital satisfaction, paternal age, paternal education, paternal depressive symptoms, concurrent household income, child sex, division of childcare, and temperament) were included in the model based on theory and previous research, as shown in **Figure 1**. Paternal sensitivity during infancy was significantly related to maternal sensitivity during infancy ($\beta = 0.21, p = 0.019$) and concurrent paternal depression ($\beta = 0.17, p = 0.046$). Higher levels of competitive coparenting were linked to lower paternal marital satisfaction during toddlerhood ($\beta = -0.20, p = 0.042$). All other covariates were not statistically significant when considered simultaneously in the full model.

TABLE 1 | Bivariate correlations of study variables.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Father sensitivity, 8 month.	—															
2 Father sensitivity, 24 month.	0.49***	—														
3 Competitive coparenting	-0.22*	-0.30*	—													
4 TRF: Externalizing	-0.03	0.09	-0.12	—												
5 Father Involvement	0.04	0.16	-0.00	-0.14	—											
6 Child sex	0.23*	0.15	-0.04	-0.14	0.01	—										
7 Father age	0.20*	0.25*	0.06	0.03	0.00	0.02	—									
8 Father education	0.14	0.12	-0.02	0.01	0.18	0.10	0.32***	—								
9 Father depression	0.25**	0.16	-0.09	-0.10	-0.00	-0.07	0.16	0.22*	—							
10 Mother sensitivity, 8 month.	0.01	0.03	-0.11	-0.13	-0.17	0.08	0.02	-0.11	0.11	—						
11 Mother sensitivity, 24 month.	-0.23*	-0.18	-0.11	-0.06	-0.09	0.02	-0.08	-0.09	-0.23*	0.09	-0.04	—				
12 Father marital satisfaction	0.12	0.20	-0.29**	-0.10	-0.06	0.06	0.38***	0.35***	-0.10	0.13	0.03	-0.09	—			
13 Family income, 8 month.	-0.05	0.06	-0.05	-0.05	0.06	0.05	0.23*	0.25*	-0.09	-0.00	0.13	-0.13	0.80***	—		
14 Family income, 24 month.	0.18	0.19	-0.02	-0.03	0.01	0.12	-0.01	0.18	-0.04	-0.11	-0.09	-0.21	0.49***	0.62***	—	
15 Family income, 7 years.	-0.13	-0.12	-0.02	-0.12	0.15	0.07	-0.23*	-0.18	0.02	0.10	-0.05	-0.05	-0.07	0.03	0.04	—
16 Infant temperament	4.44	5.26	1.79	51.34	0.34	0.41	31.67	4.53	7.76	4.41	5.60	5.74	3.50	3.81	4.21	0.49
Mean	(0.83)	(1.02)	(0.91)	(8.61)	(0.12)	(0.49)	(6.31)	(1.13)	(5.94)	(0.90)	(0.92)	(1.04)	(1.20)	(1.10)	(0.85)	(1.68)
SD																

N = 125.

For child sex, female is the reference group.

TRF, Teacher Report Form; *p < 0.05, **p < 0.01, ***p < 0.001.

Significant correlations are shown in bold.

DISCUSSION

This prospective longitudinal study following families over 6 years identifies early risk factors for childhood psychopathology. Findings in this study underscore the unique role of sensitivity in father-child interactions during the first 2 years on children's well-being in middle childhood. We found stability in the level of fathers' sensitive care with their child from 8 to 24 months, and we identified two different indirect pathways from fathers' insensitive interactions at 8 months to their children's externalizing problems at age 7. First, fathers' sensitivity at 8 months in the context of caregiving activities (feeding, clothes change) and play predicted externalizing problems in middle childhood through fathers' sensitivity at 24 months. Secondly, fathers' sensitivity at 8 months also significantly predicted externalizing problems in middle childhood through competitive, undermining coparenting interactions at 24 months.

Finding that the quality of early paternal care plays an important role in children's later adjustment is consistent with previous research showing that insensitive and intrusive control, and harsh, coercive, and punitive parenting are strongly implicated in the development and stability of conduct disorders. In contrast, warmth, responsiveness and sensitivity are associated with lower rates of later behavior problems (Campbell et al., 2000; Trautmann-Villalba et al., 2006) and higher rates of prosocial behavior (Hastings et al., 2007; Ferreira et al., 2016).

It is interesting to note that father sensitivity at 8 months did not directly predict children's externalizing behavior, but it did predict father sensitivity at 24 months. This result is consistent with Towe-Goodman et al. (2014) study demonstrating that paternal sensitivity and support at 24 months, but not 7 months, was associated with children's executive function at age 3. Our results indicate that continuity of sensitive paternal caregiving from 8 to 24 months is particularly important. Not only do fathers spend more one-on-one time with their children as they get older, but they also engage in more stimulating play, such as rough-and-tumble play (MacDonald and Parke, 1986). In the context of such highly stimulating play, sensitive fathers can comfort and calm an overstimulated, fearful, or angry child, which may help them regulate strong emotions and avoid externalizing behaviors (Paquette, 2004; Hazen et al., 2010). Indeed, a recent meta-analysis found that children's engagement in stimulating physical play with fathers was related to better social and emotional skills, and higher self-regulation, all of which were negatively related to externalizing problems (StGeorge and Freeman, 2017).

This study also demonstrated the unique role of sensitive paternal caregiving in the coparenting alliance and children's later adjustment. Paternal sensitivity was associated with coparenting, which was in turn associated with children's externalizing behavior, even after controlling for maternal sensitivity at both 8 and 24 months, paternal depression, paternal involvement, and marital satisfaction. Previous studies have examined the effects of undermining coparenting behavior on mothers and fathers caregiving quality (Jia and Schoppe-Sullivan, 2011). Yet, from a family systems perspective it is also important to understand how

caregiving quality is associated with the developing coparenting alliance observed in the triadic interactions (Brown et al., 2022).

This study is one of the first to identify the contribution of fathers' sensitivity with infants during the first year of life to the coparenting relationship with younger children. Our findings are consistent with previous studies with older children showing father-child interaction quality with 18-month-olds was associated with triadic coparenting interactions when children were 6 years old (Bernier et al., 2021). Mothers may undermine their husbands' input about parenting when they perceive their husbands as incompetent as caregivers, leading to more critical and competitive coparenting behavior. Our findings are also consistent with past studies that have found that attachment security, characterized by sensitive parenting, is related to coparenting quality (Bureau et al., 2021).

This study has several strengths. The study was longitudinal and included observational assessments of dyadic and triadic interactions. Also, fathers were observed interacting with their infants across multiple contexts, including feeding, changing their infants' clothes, and playing with their infant. Moreover, unlike many studies that rely solely on parent reports of childhood behavior problems, the current study obtained assessments of children's externalizing symptoms from the children's teacher. This minimizes the likelihood that the parents' relationship with their child influenced ratings of their children's well-being. Further, most previous studies have examined paternal caregiving with older children in the context of play and problem-solving tasks. Findings of this study demonstrate that father-child interaction in infancy can have long-term implications for children's healthy social-emotional development.

This study also has several limitations. First, we did not assess coparenting soon after the baby was born. It is possible that there is continuity in coparenting quality over the child's first 2 years of life. It may be the case that undermining coparenting soon after the child's birth spilled over to fathers' behavior with the infant, which furthered competitive and undermining coparenting behavior at 24 months. Moreover, the study includes observational data and data collected over 7 years, but the sample is small. There was sufficient statistical power to detect the direct effects, above 0.80, based on a Monte Carlo Simulation that took into account missing data. However, the power to detect indirect effects was lower, ranging from 0.48 to 0.71. It will be important to replicate these findings with a larger sample. Finally, although the sample was mixed socioeconomically, it was primarily white and included only heterosexual two-parent families. It is unclear whether findings in this study generalize to families with non-residential fathers, single fathers, gay couples or parents with different gender orientations.

It may also be important for future studies to consider the role of the marital relationship in the association between the father-infant relationship and the coparenting alliance. Mothers who view their husbands' caregiving more positively may be more likely to engage and support fathers in caring for their children, contributing to warmth, support and positivity in the marriage. At the same time, when the quality of the marriage declines, fathers may become less involved in caregiving (Christopher

et al., 2015), compromising the quality of care they provide their children (Murphy et al., 2017b).

Findings in this study highlight the importance of developing effective early interventions to help fathers be more sensitive, responsive, and emotionally available to their infants, when needed, and to engage in less interfering and intrusive behavior. Fostering paternal sensitivity early in children's lives could help improve the developing coparenting relationship. These findings also suggest that it is important to strengthen both the father-child dyadic and the mother-father-toddler triadic coparenting relationships. This can reduce the likelihood that children will engage in aggressive and rule breaking behavior in school at a time when learning appropriate social skills and making friends is critical to their well-being.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Internal Review Board (IRB) at the University of Texas at Austin. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

DJ wrote the initial draft of the manuscript, contributed to the conceptualization, organized the data collection, and revised the manuscript. NH contributed to the conceptualization, organized data collection, organized coding of the data, wrote parts of the manuscript, and assisted with revisions. AA contributed to the conceptualization, performed the statistical analyses, wrote the initial draft of the results section, and created the figure and initial versions of the table. GA, ZT, and SZ contributed to the conceptualization, wrote parts of the manuscript, and assisted with revisions. All authors contributed to the article and approved the submitted version.

FUNDING

This research was supported by Grant SBR-9212990 from the National Science Foundation and Grant 3332 from the Hogg Foundation for Mental Health. These funding agencies supported collection of the data used in this manuscript.

ACKNOWLEDGMENTS

We would like to acknowledge support from the Phyllis R. Richards Professorship and the University of Texas Population Research Center.

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Disentangling the Effect of Sex and Caregiving Role: The Investigation of Male Same-Sex Parents as an Opportunity to Learn More About the Neural Parental Caregiving Network

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OPEN ACCESS

Edited by:

Martin I. Gallegos,
University of Texas at San Antonio,
United States

Reviewed by:

Allen Mallory,
The Ohio State University,
United States

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equally to this work

Specialty section:

This article was submitted to
Gender, Sex and Sexualities,
a section of the journal
Frontiers in Psychology

Received: 23 December 2021

Accepted: 18 January 2022

Published: 14 February 2022

Citation:

Giannotti M, Gemignani M, Rigo P, Simonelli A, Venuti P and De Falco S (2022) Disentangling the Effect of Sex and Caregiving Role: The Investigation of Male Same-Sex Parents as an Opportunity to Learn More About the Neural Parental Caregiving Network. *Front. Psychol.* 13:842361. doi: 10.3389/fpsyg.2022.842361

Keywords: parental brain, parental involvement, same-sex parents, parenting, neural, caregiving

INTRODUCTION

Since the traditional family structure (i.e., a mother, a father, and children) does not reflect the composition of families in contemporary society anymore, research has gradually expanded to examine parenting and child development in new family forms (Carone et al., 2021). Additionally, numerous studies have pushed beyond the study of mothering, considering paternal role as a remarkable factor (Singley et al., 2018). In this regard, recent data has described increasing father involvement in childcare over decades, pointing to its positive effect on the health of children and parents (Lamb, 2010). In this framework, the inclusion of male same-sex couples in the field of parenting research has provided further insights in terms of understanding the influence of caregiving role on paternal outcomes and family dynamics (Brown et al., 2012; Allport et al., 2018). As a general remark, research displayed that male same-sex parents showed positive parenting qualities (i.e., high level of warmth and responsiveness, great number of interactions, and low level of disciplinary aggression) (Golombok et al., 2014; Baiocco et al., 2015; Feugé et al., 2020), and suggested that parenting quality and child outcomes are the result of the family processes (i.e., warmth, sensitivity) rather than of the family structure (Farr and Vázquez, 2020; Carone et al., 2021). However, only few results regarding the neurobiology of human caregiving in male same-sex parents have been outlined so far (Abraham et al., 2014). Noteworthy, neurobiological characteristics of parenthood would provide a powerful theoretical and empirical framework in understanding reciprocal interactions between caregivers and infants (Swain, 2011). In this article, we initially propose a summary of evidence addressing functional neurobiological aspects of fatherhood in different-sex families, since no inherent differences in the parental caregiving network (i.e., brain structures and activations supporting parental caregiving) has been described as a function of sexual orientation (Abraham et al., 2014). Next, we review some findings on the relation between neurobiological activations and paternal involvement, and we highlight the potential opportunities and challenges of conducting research on male same-sex parents specifically. Besides enriching the conceptual grounding, investigating the neurobiological characteristics of male same-sex parents in the light of their involvement in childcare could improve the soundness of studies in methodological terms, by disentangling biological (i.e., sex) and socio-cultural factors (i.e., paternal involvement) influencing paternal neural responses to infants.

PATERNAL BRAIN CIRCUITS IN DIFFERENT-SEX FAMILIES

Research on animal models has pointed out that paternal caregiving may rely on some specific neural circuits and networks when compared to those underlying maternal behaviors (Swain et al., 2014; Rilling and Mascaro, 2017). In spite of a potential overlap between maternal and paternal networks related to caregiving, human fathers have shown a specific pattern of brain activations when responding to infant stimuli (Atzil et al., 2012; Abraham et al., 2014). Generally, whilst mothers tend to activate an emotional neural circuitry of subcortical structures (i.e., Amygdala, Nucleus Accumbens, Insula and Ventral Anterior Cingulate Cortex), fathering behaviors mostly rely on the activity of socio-cognitive cortical areas (i.e., Medial Prefrontal Cortex, Dorsolateral Prefrontal Cortex, Dorsal-Anterior Cingulate Cortex, Superior Temporal Gyrus and Inferior Frontal Gyrus) (Atzil et al., 2012; Rajhans et al., 2019). Summarizing findings related to paternal brain responses to auditory and visual infant stimuli, Provenzi et al. (2021) described three main brain networks. Specifically, the activation of Mentalization-related areas (i.e., Superior Temporal Sulcus, Medial Prefrontal Cortex) was associated with fathers responding to infant stimuli, in order to appropriately understand feelings and thoughts. Similarly, the activation of an Embodied Simulation network (i.e., Anterior Insula, Middle and Lateral Superior Frontal Gyrus, Ventral Anterior Cingulate Cortex) have been found to promote an understanding of infants' intentions by simulating internal feeling states, and an Emotional Regulation network (i.e., Inferior Frontal Gyrus, Orbitofrontal Cortex) have been proposed to foster sensitive caregiving by strengthening emotional processes. It is notable that these hard-wired functional brain networks, in turn, are associated with hormonal changes modulating fathering behaviors (Storey et al., 2020).

PATERNAL BRAIN AND INVOLVEMENT IN CHILDCARE IN DIFFERENT-SEX FAMILIES

Beyond the sex-specificity of some neurobiological patterns (De Pisapia et al., 2013; Rigo et al., 2017; Rajhans et al., 2019), it has been suggested that the activations of the parental caregiving network may not be only ascribable to biology-related factors (i.e., sex), but also influenced by a great variety of other variables (i.e., contextual requirements, role definitions, cultural beliefs, and individual life histories) (Feldman et al., 2019). Accordingly, the neural network related to parenting proved malleable to adapting to social environments and childcare experiences (Horstman et al., 2021). In line with a previous review (Storey et al., 2020), we suggest that even the endocrine patterns related to fatherhood could be regarded as plastic and flexible. Therefore, the consideration of relevant contextual factors such as fathers' involvement might be essential for a better understanding of the whole paternal neurobiology. Relatedly, neurobiological research reported a relationship between greater paternal involvement and the activations of

some brain areas involved in the caregiving network (Feldman, 2015), namely a larger activation of the Ventral Tegmental Area and a moderate level Anterior Insula activity (Mascaro et al., 2013, 2014). Also, more hours spent in direct childcare has been related to higher Amygdala resting-state functional connectivity with other parenting related brain areas, such as Supramarginal Gyrus, Postcentral Gyrus, and Superior Parietal lobe (Horstman et al., 2021). Recently, fathers' self-reported attitude toward their role, which may be considered as one trait-like predictor of father involvement, was positively associated with the degree of interpersonal neural synchronization (INS) in father-child interaction (Nguyen et al., 2021). The amount of fathers' involvement has been additionally correlated with the regulation of hormones triggering caring behaviors, such as a downregulation of Prolactin and an upregulation of Cortisol (Gettler et al., 2011; Kuo et al., 2018). In line with evidence from animal models (Featherstone et al., 2000; Nunes et al., 2001; Swain et al., 2014; Storey and Ziegler, 2016), assuming the role of a committed parent and engaging in active care of the offspring may modulate parental responses toward infants, promoting a sensitive caregiving. However, a study has recently outlined that the investigation of parental involvement has been highly debated in both methodological and conceptual terms (Chen and Zhu, 2017), since some measures did not prove sufficiently appropriate for capturing all the nuances of that complex construct. For instance, some authors considered only partial components of paternal involvement, or collapsed heterogeneous aspects into a limited measure (Chen and Zhu, 2017). As an additional issue, the gendered division of childcare in heterosexual couples make it difficult to disentangle the difference between the role of sex and involvement. Considering statistical analyses, this could result in a systematic bias, since fathers may be consistently less involved as compared to mothers. To appropriately disambiguate this bias, we suggest that including male same-sex parents could unravel the actual contribution of caregiving involvement to paternal responsiveness at neurobiological level, thereby excluding the confounding role of socio-cultural differences related to the biological sex of parents. As compared to same-sex mothers, the amount of contact with children may be particularly relevant for male same-sex parents' neurobiology, since they do not experience the physiological changes that come along with gestation.

NEUROBIOLOGY OF PARENTAL CAREGIVING IN MALE SAME-SEX PARENTS

To date, only one study (Abraham et al., 2014) addressed the neurobiological correlates of male same-sex parents when responding to videos of parent-infant interactions. Particularly, authors tested heterosexual different-sex couples comprising primary-caregiving mothers (PC-Mothers) and secondary-caregiving fathers (SC-Fathers), and primary-caregiving homosexual fathers (PC-Fathers). Results showed that PC-fathers displayed an Amygdala activation as high as PC-Mothers,

and a Superior Temporal Sulcus activation as high as SC-Fathers. Additionally, PC-fathers showed a significant functional connectivity between the two brain structures (i.e., Amygdala, Superior Temporal Sulcus) in response to self-infant interactions. Even though the task-related functional connectivity between Amygdala and Superior Temporal Sulcus was observed only in PC-fathers, the overlap between the two structures was linked to the time spent in infant care among all fathers. Importantly, no difference emerged between biological and adoptive homosexual fathers in behavior, oxytocin concentrations or the extent of activations in any brain areas, thus highlighting the important role of involvement in childcare over other factors. Overall, being engaged with childcare may be associated with the activation of a global caregiving network involving both cortical and subcortical brain areas subserving parenting, in women and men and in both biological parents and those genetically unrelated to the child (Abraham et al., 2014). This complex coupling between emotion and cognition networks may ultimately promote a sensitive parenting. In light of these results, we might confirm that the investigation of paternal involvement and brain responses to infant cues among male same-sex parents would provide some valuable insights into the distinction of the role of sex and involvement. This could be particularly useful, especially when considering that the division of childcare in same-sex couples is more egalitarian as compared to that of heterosexual couples (Tornello et al., 2015; Rubio et al., 2020). In fact, whilst same-sex parents might perceive more equity in terms of childcare division, mothers usually spend more time with childrearing as compared to fathers in different-sex families (Geist and Cohen, 2011; Fossoul et al., 2013; Feugé et al., 2019). Additionally, gay fathers displayed high levels of involvement for both physical play and emotional support domain, being close to the traditional paternal role with regard to physical play but standing out with high levels of involvement in emotional support as well (Feugé et al., 2019).

Instead, it is reasonable that results investigating the impact of involvement in fathers from different-sex families may be biased by traditional gender norms and values, and so inclusive research of different family forms is needed, especially those in which fathers are the primary caregivers (Ellis-Davies et al., 2022). Despite the limited amount of neurobiological research, a slightly larger number of behavioral studies addressed paternal sensitivity focusing on male same-sex parents (e.g., Feugé et al., 2020). Some of these studies (Carone et al., 2020; Ellis-Davies et al., 2022) have not succeeded in finding significant associations between involvement and parenting qualities in fathers, as they may have been limited by the way caregiver role has been measured. For instance, as compared to an absolute and continuous measure of caregiving involvement, a relative measure of the construct (i.e., the degree to which fathers and mothers are involved in child rearing activities as compared to their partners) has failed to detect a significant effect also in another relevant study (Helmerhorst et al., 2022). Promising findings in this field have been outlined by Abraham et al. (2014), with results showing that primary-caregiving fathers displayed a greater dyadic synchrony than secondary caregivers, thereby highlighting the role of involvement for the quality of parent-child interactions. Notably,

this study adopted an appropriate and detailed measure to capture the nuances of paternal involvement, and this sound methodology might be linked to the overall encouraging findings. Considering the link between the behavioral and neurobiological characteristics of fathers, it is notable that these results could be seen as promising for future research addressing underlying parental neurobiological aspects. On this note, future studies on paternal care and neurobiology of fatherhood among same-sex parents could adopt a multidimensional assessment of paternal involvement based on continuous scores, in order to capture the wide range of variability of the construct by using dimensional rather than dichotomous categorical outcomes (e.g., primary vs. secondary caregivers). Overall, more efforts should be put into the examination of the caregiving network in male same-sex parents, with the aim to confirm and extend preliminary findings on the influence of childcare experiences on brain activations. Remarkably, much research on male same-sex parents might constitute a fascinating perspective shedding light on the adaptability of fathers brain when the primary caregiving role is assumed and no changes associated with gestation are experienced.

STRUCTURAL BARRIERS FOR MALE SAME-SEX COUPLES BECOMING PARENTS

Beyond the relevant benefits of conducting studies on diverse family forms, the difficulties in recruiting male same-sex parents should be considered. Even though socio-cultural changes are leading to more variation in the family structures, the access to reproduction technology and adoption as well as the legal barriers are still conspicuous challenges for the long journey to parenthood. Moreover, as a part of a marginalized community, same-sex families of men may be victim of stigmatization and contextual stressors, as they may negotiate a multiminority status for potentially being gay and being homosexual parents (Armesto, 2002). In addition, as compared to female same-sex parents, they may suffer from the importance placed on motherhood and the general devaluation of fatherhood. In this regard, studies should take into account the role of stigma-related stressors in order to isolate their effects from other factors (Farr and Vázquez, 2020).

In spite of the difficulties, we suggest that collecting more evidence about new family forms could provide valuable insights for parenting research by adding a remarkable piece of knowledge to the field. Thereby, practice and policy could be driven by emerging evidence to reduce stigma toward same-sex parents. Methodologically speaking, researchers could rule out the effect of potential existing sex roles in different-sex couples by studying a broad range of family constellations, in which the division of care for infants is far less gendered. On this note, the real effect of involvement in childcare in modulating the neurobiological responses to infant cues could be detected, thus shedding light on the effective role played by direct experience in fathering on the paternal neural activations. In conclusion, the study of neural parental caregiving network in male same-sex parents is

a potential unique opportunity to examine the contribution of contextual factors such as parental role definitions, involvement in childcare, and cultural beliefs in shaping neurobiological bases and behavioral responses underlying nurturing behaviors.

AUTHOR CONTRIBUTIONS

MGi and MGe drafted the manuscript. SD, PR, AS, and PV substantially contributed to the conception of the manuscript and revised it critically for important intellectual content. All the

authors made a direct and intellectual contribution to the work, and approved it for publication.

FUNDING

This work was funded by PRIN 2017—Research Project of National Relevance—Ministry of Education, University and Research—same-sex and different-sex parent families through assisted reproduction: parenting, attachment, child adjustment and neural correlates.

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Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Resident and Non-resident Father Involvement, Coparenting, and the Development of Children's Self-Regulation Among Families Facing Economic Hardship

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OPEN ACCESS

Edited by:

Diogo Lamela,
Universidade Lusófona, Portugal

Reviewed by:

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Specialty section:

This article was submitted to
Gender, Sex and Sexualities,
a section of the journal
Frontiers in Psychology

Received: 29 September 2021

Accepted: 25 January 2022

Published: 21 February 2022

Citation:

Altenburger LE (2022) Resident and Non-resident Father Involvement, Coparenting, and the Development of Children's Self-Regulation Among Families Facing Economic Hardship. *Front. Psychol.* 13:785376. doi: 10.3389/fpsyg.2022.785376

Self-regulation, or the ability to effectively manage emotions and behavior, is a critical skill to develop in early childhood. Children living in a context of economic hardship are at an increased risk for developing self-regulation difficulties. However, few studies have comprehensively examined how multiple aspects of the caregiving environment, including fathers' parenting and coparenting quality, may contribute to child self-regulation. Thus, this study applied a family systems perspective to examine whether coparenting and resident and non-resident fathers' reports of parenting quantity and quality were associated with observations of children's self-regulation. Participants were drawn from the Embedded Developmental Study ($n = 257$) of the Three-City Study, a longitudinal study of children and families facing economic hardship. At Wave 1, when children were 2–4 years old, reports of parenting (i.e., quantity and quality) and coparenting (i.e., support) were obtained. At Wave 2, when children were 3–6 years old, children participated in a snack delay and gift wrap task, which assessed their self-regulation. Multi-group path analyses indicated that resident fathers' harsh parenting at Wave 1 predicted decreased levels of self-regulation at Wave 2. Non-resident fathers' reported hours of involvement at Wave 1 predicted greater levels of self-regulation at Wave 2. Additionally, supportive coparenting among families with a non-resident father predicted greater self-regulation. Supportive coparenting was not associated with child self-regulation in families with a resident father. The implications for research focused on facilitating positive father–child relationships in diverse family contexts are discussed.

Keywords: father involvement, parenting, self-regulation, coparenting, non-resident fathers

INTRODUCTION

Of the more than 12 million children under 3 years of age living in the United States, 24% live in families with a household income below the federal poverty line. An additional 22% of children live in families with a household income between 100 and 200% of the poverty line (Aber, 2012). Although growing up in a low socioeconomic environment is associated with several risks,

some children overcome the challenges and exhibit adaptive developmental outcomes. A risk and resilience framework suggests that children who thrive may possess personal or environmental resources that promote their success (Jenson and Fraser, 2016). One personal resource is children's self-regulation, or the ability to effectively manage and coordinate behaviors, thoughts, and emotions in the pursuit of a goal (Carver and Scheier, 2016). Children with high levels of self-regulation can appropriately and flexibly adjust their actions to the demands of the situation, which is advantageous in meeting expectations across a variety of formal (i.e., school) and informal (i.e., home) settings (Eisenberg et al., 2010; Drake et al., 2014). In low socioeconomic contexts, children who develop adaptive self-regulation exhibit greater resilience and school readiness (Raver, 2012). Thus, understanding factors that promote positive self-regulation in this context is beneficial for promoting positive developmental outcomes in young children.

Notably, the quality of the caregiving environment can support adaptive self-regulation, especially during the early years of life. Emerging research examining the contributions of mothers' parenting to child self-regulation in low socioeconomic contexts has revealed more positive parenting supports better self-regulation (i.e., Brophy-Herb et al., 2012; Julian et al., 2019). However, surprisingly few studies have considered how coparenting, or the extent to which parents support or undermine each other's parenting strategies, and fathers' parenting may positively contribute to the development of self-regulation. This study applied a family systems perspective (Cox and Paley, 2003) to consider how multiple family relationships may be associated with child self-regulation. In particular, fathers' parenting quantity (i.e., hours of involvement), fathers' parenting quality (i.e., self-reports of authoritative or harsh parenting behaviors), and coparenting relationship quality (i.e., support) were examined as predictors of young children's self-regulation in a sample of families facing economic hardship. Notably, statistical models included mothers' parenting quality as a control variable to more stringently evaluate whether fathers' parenting and coparenting contributed to child self-regulation beyond the contributions of mothers' parenting. Additionally, this study examined whether the links between fathers' parenting, coparenting, and child self-regulation varied between families with a resident father and families with a non-resident father.

THE DEVELOPMENT OF SELF-REGULATION

Self-regulation is a general term that refers to the variety of strategies that a child draws upon to achieve a goal. Early childhood is an important period for developing self-regulation, as children who develop strong self-regulation skills are often better equipped to achieve long-term goals (Zelazo and Carlson, 2012). The behavioral aspect of self-regulation includes controlling impulses, monitoring behavior, and inhibiting a dominant response (Calkins, 2007) and emerges during the first few years of life (Diamond et al., 2002; Holmboe et al., 2008).

Children are required to draw upon their early behavioral self-regulation strategies in many daily activities, such as when they refrain from eating a forbidden treat or raise their hand rather than shouting out the answer during class (Gagne and Saudino, 2016). Thus, self-regulation strategies are particularly beneficial in early childcare settings. For example, children with greater levels of behavioral self-regulation are better able to maintain concentration, persevere, and ultimately achieve a goal (Macdonald et al., 2014). Children who struggle to establish self-regulation by middle childhood, in contrast, often experience other social and learning difficulties later in life (Ciairano et al., 2007; Wählstedt et al., 2008). Thus, identifying family relationships that best support children's self-regulation is vital in promoting children's long-term positive adjustment and success.

The Role of Parenting

Notably, the neural networks underlying self-regulated behavior are remarkably plastic and can be shaped by environmental experiences during the early childhood years (Gunnar and Fisher, 2006). As such, high-quality parenting, characterized by warmth, sensitivity, and responsiveness, is theorized to facilitate the development of positive self-regulation skills (Rochette and Bernier, 2014). In contrast, low-quality parenting can induce stress and overwhelm the young child's emerging self-regulation system (Blair, 2010). Indeed, researchers have reported a positive association between the quality of mothers' parenting behaviors and better self-regulation skills in young children (Bernier et al., 2010; Choe et al., 2013). However, considerably less is known about the consequences of fathers' parenting quality and quantity of involvement for children's self-regulation. Modern United States fathers are more involved in their children's lives than ever before (Schoppe-Sullivan and Fagan, 2020). Thus, considering the contribution of both mothers' and fathers' parenting may yield important insights into the underpinnings of child self-regulation.

One of the most widely used conceptualizations of father involvement is the Lamb, Pleck, Charnov, and Levine tripartite model (Lamb et al., 1985, 1987), which introduced engagement, accessibility, and responsibility as key components of father involvement. As referenced in Pleck's (2010) updated version of the model, fathers' positive engagement activities may be particularly important in supporting child adjustment. Theorists propose fathers support child adjustment, including self-regulation skills, by facilitating the child's "exploration system" and encouraging children to interact with their environment and take risks (Grossmann et al., 2002; Paquette, 2004). Additionally, when fathers engage in highly stimulating positive engagement (i.e., rough and tumble play), they challenge children's emerging regulatory system, which, in turn, supports self-regulation (StGeorge and Freeman, 2017). Notably, intensive, highly stimulating father-child play is not universal. For example, in foraging societies, father-child playful interactions are rarely observed, and fathers more often engage in "intimate caregiving" (Hewlett et al., 1998).

Consistent with the view that Western fathers may engage in parenting behaviors that foster child self-regulation, a

handful of studies have examined associations between aspects of fathers' parenting and child self-regulation. Collectively, these studies have indicated that more positive parenting, including physical play (Bocknek et al., 2017), child-oriented play (Owen et al., 2013), and self-reports of parenting quality (Roskam et al., 2014; Lucassen et al., 2015) are positively associated with child self-regulation. However, studies that have included fathers tend to draw from higher-socioeconomic status samples with resident fathers (Bernier et al., 2012; Meece and Robinson, 2014), which includes children at the lowest risk for developing self-regulation difficulties. Non-resident and low-income fathers are often overlooked in child development studies due to the challenge of recruiting and tracking them longitudinally (Tamis-LeMonda and McFadden, 2010).

However, incorporating non-resident fathers is vital for obtaining a complete picture of how both parents contribute to child self-regulation across diverse contexts. The number of children with a non-resident father in the United States continues to grow. Data from the United States Census indicate that 31% of children under 18 years do not live with both of their biological parents (Census, 2016). Notably, the proportion of children living with a non-resident father varies dramatically by socioeconomic status. Among families with an annual household income below \$50,000, 41.6% of children live with their mother only and have a non-resident father. For families with an income between \$50,000 and \$74,999, 21.1% of children live with their mother only and have a non-resident father. At even higher income levels (i.e., family income \$100,000 or higher), 5.7% of children live with their mother only and have a non-resident father (Census, 2020). Often with more limited resources (i.e., time, money), low-income non-resident fathers face unique barriers to their involvement in childrearing and, as a result, report lower levels of involvement compared to resident fathers. This trend has been reported in Western countries (i.e., the United States; Mincy et al., 2015) and in other cultural contexts, where higher percentages of children have a non-resident father (i.e., the Caribbean; Gray and Brown, 2015).

Notwithstanding the barriers to involvement, social expectations for non-resident fathers to take an active role in their child's life are strong, and non-resident fathers are involved in their children's lives at increasing rates (Carlson and McLanahan, 2010; Mincy et al., 2015). Further, accumulating evidence indicates high quality non-resident father involvement contributes to improved child well-being (Carlson, 2006; Adamsons and Johnson, 2013; Nepomnyaschy et al., 2014). For example, data from the Early Head Start Research and Evaluation study of low-income fathers revealed that children with a stable relationship with a non-resident father scored higher on cognitive functioning measures than children without a stable relationship (Vogel et al., 2006). Additionally, non-resident father involvement is positively associated with better academic outcomes for children (Miller et al., 2020). However, the consequences of specific aspects of non-resident fathers' parenting for children's self-regulation remain unclear (Roy and Smith, 2013). Therefore, including both resident and non-resident fathers in studies of self-regulation would support a

comprehensive view of the role of fathers in the development of self-regulation.

The Role of Coparenting Relationship Quality

Family systems theorists view the family as a complex network of interdependent relationships (i.e., mother-child, father-child, sibling) that, when considered together, create a whole greater than the sum of its various parts (Cox and Paley, 2003). Thus, beyond the parenting-child relationship, relationships at the family level are a key context in which children's self-regulation develops. The coparenting relationship, or the extent to which the child's caregivers can effectively work together and coordinate child-related responsibilities (Feinberg, 2003), is considered the "executive subsystem" of the family (Minuchin, 1974). The quality of the coparenting relationship can vary between families—with some parents exhibiting warm, supportive coparenting relationships and other parents undermining each other and competing for their child's attention. As such, the quality of interparental interactions can theoretically "spillover" and influence the quality of other family subsystems.

A growing body of research has revealed direct associations between coparenting relationship quality and child outcomes (Teubert and Pinquart, 2010). In particular, when parents do not support each others' parenting strategies, child adjustment suffers (Nandy et al., 2021). In contrast, when coparenting support is high, children exhibit fewer internalizing and externalizing difficulties (Farr et al., 2019). So what explains the direct link between coparenting and child outcomes? The emotional security hypothesis suggests that when parents support each other's parenting strategies and the overall atmosphere between parents is calm and respectful, children have a greater sense of security (Davies et al., 2002). Conversely, when parents undermine and disrespect each other's parenting, children experience increased feelings of stress and reactivity that may interfere with their ability to self-regulate (Kuhlman et al., 2018).

Research examining associations between coparenting and child self-regulation remains largely understudied. However, in one notable exception, researchers reported a link between supportive coparenting and children's self-regulation among families living in Portugal (Baptista et al., 2018). In particular, lower levels of cooperation predicted more self-regulation difficulties in children. Although this work is an important first step in advancing the field's understanding of how the coparenting relationship is associated with child self-regulation, the study design was cross-sectional. Additionally, it did not include mothers' parenting quality as a predictor. The current study builds upon this research by examining longitudinal associations between mothers' and fathers' parenting, coparenting relationship quality, and child self-regulation in a sample of United States families experiencing economic hardship. In addition, in the current study, children's earlier levels of self-regulation are included as a control variable. This approach enables a more thorough examination of whether early parenting and

coparenting contribute to an *increase* or *decrease* in children's self-regulation over time.

THE PRESENT STUDY

Grounded in family systems theory, the central goal of this study was to more comprehensively consider how multiple aspects of the caregiving environment are associated with children's self-regulation. In particular, fathers' parenting (i.e., quality and quantity) at Wave 1 was examined as a predictor of subsequent child self-regulation at Wave 2. It was expected that children would exhibit greater self-regulation when fathers are more involved and take an authoritative approach in their parenting. Fathers' harsh discipline strategies and low levels of involvement, in contrast, were expected to be associated with decreased self-regulation. Beyond fathers' parenting behaviors, the family system is an important context in which children's self-regulation develops. Although largely unexplored, coparenting relationship quality (i.e., supportive coparenting) was also considered as a predictor of child self-regulation. It was expected that greater coparenting relationship quality, characterized by support between parents, would be associated with greater self-regulation in children.

I also examined whether there were differences between children with a resident father and children with a non-resident father. Because non-resident fathers do not live with their children, they may face unique barriers to being involved in their children's lives. Prior research has revealed positive contributions of non-resident father involvement for child outcomes (Adamsons and Johnson, 2013). However, few studies have examined children's self-regulation as an outcome. In this study, I expected that non-resident father involvement would be positively associated with child self-regulation. However, the extent to which quantity versus quality of involvement might be associated with child self-regulation was an exploratory question. Additionally, an exploratory question was whether the effects of coparenting relationship quality would be the same for children with a resident versus a non-resident father. Supportive coparenting may be beneficial for children's self-regulation regardless of their father's residential status. Alternatively, supportive coparenting might be more beneficial for some children than others. For example, supportive coparenting might be even more valuable in circumstances where fathers are non-resident. When fathers are not physically residing with their children, supportive coparenting might be especially important in creating a positive emotional climate in the home. Low levels of supportive coparenting, in contrast, might be even more negatively associated with child self-regulation when fathers are non-resident.

Certain child characteristics were included in the final model to better disentangle the consequences of fathers' parenting for child self-regulation. Namely, child gender was included as a control variable, as prior research has indicated that female children outperform males on measures of self-regulation (Matthews et al., 2009). Additionally, child age was controlled, as older children are likely better able to self-regulate (Raffaelli et al., 2005).

MATERIALS AND METHODS

Participants and Procedures

Participants were drawn from Welfare, Children, and Families: A Three-City Study, a longitudinal and multi-method study of the well-being of low-income children, families, and communities in Boston, Chicago, and San Antonio during the post-welfare reform era (Angel et al., 2012). Approximately 2,400 children living in low-income families (ages 0 to 4 or 10 to 14 years old), defined as a household income less than 200% of the federal poverty threshold, were obtained using stratified, random sampling techniques.

Although the child and the child's primary female caregiver (typically the biological mother) were the focus of the larger study, efforts were taken to provide additional depth to evaluations of child adjustment. In particular, the Three-City Study also included an Embedded Developmental Study (EDS) component, which focused on children aged 2 to 4 years at Wave 1 and children aged 3 to 6 years at Wave 2 of the longitudinal study, as this is a sensitive developmental period in which patterns of behavior and ways of responding to the environment are established. This developmental period also requires parents to learn effective strategies of responding to their child and providing appropriate warmth, discipline, and opportunities for learning (Winston et al., 1999). The EDS was developed to gather a more detailed understanding of various environments and processes that influence child adjustment during the early childhood period (Winston et al., 1999). Principal investigators of the Three-City Study designed the EDS to provide detailed information about father involvement and childcare.

To supplement the principle points of data collection in the Three-City Study, the primary method of measurement in the EDS was observational assessments, in addition to a detailed interview with the child's biological father and mother (at Wave 1 only). As an incentive to participate in the EDS, each participant (i.e., mother, child care provider, and father) received \$30. In addition, the child received a small toy for participating in the videotaped assessments.

All children ages two to four and their parents were invited to participate in the EDS. Of the approximately 2,400 children who were included in Wave 1, approximately 31% were between 2 and 4 years of age ($n = 737$). Of eligible children included in the EDS ($n = 737$), 626 mothers completed the required EDS measures (R.R. = 84.9%). When EDS-eligible mothers provided contact information and researchers were also able to locate fathers, interviews were conducted with the focal child's biological father. Of eligible fathers who were reached and agreed to participate in the study ($n = 272$), eight fathers reported that they had not had any contact with the focal child in more than 12 months. These fathers were not asked questions about the quality of involvement with their children and, therefore, were not included in the present study (Little et al., 2014)¹. After accounting for missing data on variables of interest, 257 fathers were included in the final

¹Traditional methods to estimate missing data (i.e., FIML) assume that the data are missing completely at random or missing at random. The eight participants that were omitted from the analysis were not asked questions on key variables of interest (i.e., parenting) due to a lack of contact with their child.

sample. Of participating fathers, 106 were resident (41.25%) and 151 were non-resident (58.75%) at Wave 1, when parenting and coparenting were assessed. Of families with a non-resident father ($n = 151$), 9.9% of children had a stepfather or maternal boyfriend father figure. Three maternal boyfriends lived in the household.

From Wave 1 to Wave 2, 26 fathers changed from residential to non-residential. Nineteen fathers changed from non-residential at Wave 1 to residential at Wave 2. There were no significant differences in Wave 2 self-regulation scores among children who experienced a change in their father's residential status compared to the rest of the sample in the snack delay task [$t(189) = -0.63$, $p = 0.53$] or the gift wrap task [$t(189) = -0.69$, $p = 0.49$].

Additionally, among the full sample ($n = 257$), 192 families had data on child self-regulation at Wave 2 (74.7%). Attrition analyses indicated that there were not statistically significant differences in Wave 1 child self-regulation in the snack delay task [$t(216) = -0.38$, $p = 0.71$], Wave 1 child self-regulation in the gift wrap task [$t(212) = 0.30$, $p = 0.77$], child age [$t(255) = 0.12$, $p = 0.91$], or fathers' education level [$t(255) = 1.62$, $p = 0.11$] between families with Wave 1 and Wave 2 data and families with Wave 1 data only.

Graduate students and upper-level undergraduate students with training in child psychology or education were hired for coding children's self-regulation at Waves 1 and 2, as principal investigators believed they would be more aware of the constructs of interest. The team of coders trained to assess child-self regulation included seven coders. Of the seven coders, four coders were fluent in Spanish. Each coder participated in 10 weeks of training, during which coders were introduced to the larger study and discussed issues related to family process, child development, and cultural sensitivity. After coders learned the entire coding scheme, 10 tapes were coded on all variables and interrater reliability was established. After training, approximately 25% of cases were double-coded, and the trainer checked scores and coders met to discuss discrepancies and come to an agreement. Note, all data in the current study, including the observational codes of self-regulation, were obtained from the EDS. The study author only had access to publicly available, de-identified data. The data are publicly available: <https://www.icpsr.umich.edu/web/DSDR/studies/4701>.

Comparing Participating and Non-participating Fathers

Prior to conducting the main analyses, preliminary analyses were undertaken to examine potential similarities and differences between participating ($n = 257$) and eligible, non-participating fathers ($n = 480$). In cases where fathers did not participate, a majority were non-resident fathers (92.29%), as indicated by mother reports. Of fathers who did not participate and were non-resident, 37.16% lived outside the city and 9.3% were in jail or in an institution other than jail. Additionally, independent samples t -tests were conducted to clarify the ways in which participating fathers might or might not have been similar to non-participating fathers. Although data were not available for non-participating fathers' education level, there was not a statistically significant difference in maternal education between the two

groups [$t(721) = -0.46$, $p = 0.6424$]. There was not a statistically significant difference in household income between the two groups [$t(590) = 0.43$, $p = 0.67$]. Finally, for all fathers, mothers responded to the question "About how often has [FATHER] seen [CHILD] during the past 12 months?" on a scale of 1 (never in the past 12 months) to 5 (almost every day). On the whole, participating fathers saw their child more frequently ($M = 4.09$, $SD = 1.07$) than non-participating fathers ($M = 3.12$, $SD = 1.36$) [$t(431) = -7.58$, $p < 0.001$].

Measures

Wave 1

Parenting

Both mothers and fathers reported on their relationship with the focal child and their parenting practices. Parents reported the degree to which they agreed with various types of parenting strategies (1 = *definitely true* to 4 = *definitely false*). Seven items assessed authoritative parenting practices (i.e., "I give [CHILD] a chance to explain [his/her] side before punishing [him/her]" or "I try to show that I understand [CHILD]'s feelings when I punish [him/her] for misbehaving" or "I try to make rules which take [CHILD]'s individual needs into consideration"). Two items assessed harsh parenting practices (i.e., "I think that a good spanking is sometimes needed to make [CHILD] understand" or "I spank [CHILD] when [he/she] has done something really wrong"). Items were recoded so that higher responses indicated a higher endorsement of the items. Then, authoritative and harsh parenting items were averaged separately to create authoritative and harsh parenting composite variables for each parent. The reliability for each scale are provided: fathers' authoritative ($\alpha = 0.56$) and harsh ($\alpha = 0.78$) parenting behaviors and mothers' authoritative ($\alpha = 0.67$) and harsh ($\alpha = 0.81$) parenting behaviors.

Fathers' Quantity of Involvement

Fathers were asked to estimate how many hours they were currently taking care of the focal child per week by responding to the question, "These days, do you ever take care of your child?" and "About how many hours?" A standardized composite variable was computed to indicate fathers' current level of involvement in childcare.

Coparenting Support

Mothers and fathers reported on coparenting support via two items that ranged from 1 (*none*) to 4 (*a lot*). Fathers responded to the question, "These days, how much does your involvement make things easier for [CHILD]'s mother or make her a better parent?" In contrast, mothers responded to the question, "How much does father involvement make things easier for you or make you a better parent?" Additionally, fathers responded to the question, "These days, how much does your financial or material support, such as money, housing, or things like diapers or clothes for [CHILD], help [his/her] mother?" Mothers responded to the question, "How much did father financial and material support such as money, housing, or things like diapers for [CHILD] help you?" Cronbach's alpha indicated acceptable internal consistency for mothers' ($\alpha = 0.88$) and fathers' reports ($\alpha = 0.81$). Fathers'

perceptions of coparenting support and mothers' perceptions of coparenting support were averaged ($r = 0.54, p < 0.001$).

Self-Regulation

Self-regulation was assessed using two delay of gratification tasks designed to measure children's ability to inhibit a dominant response in order to achieve a specific goal. The structure and coding of both self-regulation tasks were based on the Gift Wrap and Snack Delay tasks developed by Kochanska et al. (1996). In the Gift Wrap task, the experimenter tells the child that he or she will receive a present. However, the experimenter wants to wrap it, and the child is instructed not to peek while the experimenter noisily wrapped the present for 50 s. Children's specific peeking behaviors were coded on a scale of 0 (child gets out of his/her chair and goes over to field investigator) to 7 (child does not try to peek). Additionally, time lapsed to first peek and time lapsed to turning around, defined as when the child shifts hips to look, were coded. A composite self-regulation score in the gift wrap task was computed by standardizing and taking the mean of children's behavior, time at first peak, and time to turn around in the gift wrap task, with higher scores indicating better self-regulation. Cronbach's alpha indicated acceptable internal consistency ($\alpha = 0.93$).

Children's self-regulation was also assessed using the Snack Delay task. In this task, children were asked to wait until they heard a bell to retrieve an M&M candy. Four trials (varying in length from 20, 40, 60, and 30 s) assessed two components: (1) the time from the start of trial (when the M&M was given to the child) until the research assistant lifted the bell, signifying the end of the procedure is near, and (2) the time from when the research assistant lifted the bell to the time when the research assistant rang the bell, signifying the end of the procedure. For each trial, coders entered two scores: (1) the difference between the start and end time, and (2) the specific behaviors exhibited by the child in the task. The end time was documented when either the bell was rung or the child ate the M&M, as noted as when the M&M passed the child's lips—whichever event came first. The child's uninhibited behaviors were coded on a scale of 0 (*child eats M&M during Part I*) to 10 (*child waits until bell rings to eat M&M*). If multiple behaviors occurred, the most uninhibited behavior was coded. A single composite variable indicating children's overall behavioral regulation in the snack delay task was created by standardizing and taking the mean of children's behavior regulation and composite proportion of time waited to eat the snack. Cronbach's alpha indicated acceptable internal consistency ($\alpha = 0.77$).

Resident Status

Mothers reported fathers' residential status via a single question: "Does father live in the same household as child?" (1 = *yes*; 2 = *no*).

Wave 2

Self-Regulation

Two similar delay-of-gratification tasks were used to assess children's ability to inhibit a dominant response. In the Gift Task, the child was given a can of Play-Doh and instructed not to touch it. The research assistant explained that he or she

would look for a second can of Play-Doh to give the child. Coders assessed how long children waited to touch the can of Play-Doh, how long children waited to open the can of Play-Doh, and how well the child refrained from touching the can of Play-Doh on a scale of 1 (*child takes Play-Doh out of can*) to 10 (*child does not touch the can*). In instances where the child exhibited multiple behaviors, the least controlled behavior was coded. Only the first 50 s of the task was coded. A composite score indicating children's overall behavioral regulation in the Gift Task was calculated by standardizing the behavior code, the time reflecting how long the child waited to open the gift, and the time reflecting how long the child waited to touch the gift, and then taking their average. Cronbach's alpha indicated acceptable internal consistency ($\alpha = 0.84$).

Children were also asked to wait until a bell rang to retrieve an M&M candy. Six trials that varied in length were administered. Each trial included two parts: (1) The time from the start of the trial until the research assistant lifted the bell, signifying the end of the procedure is near, and (2) the time from when the research assistant lifted the bell to the time the research assistant rang the bell, signifying the end of the procedure. Each trial included a score to indicate the difference between the actual start and end time (the time at which the bell was rung or the M&M candy was eaten – whichever came first), and a score to indicate specific behaviors that occurred during each trial. The M&M candy was considered "eaten" at the moment the candy passed the child's lips—even if the child still had his/her fingers on it or later took it out of his/her mouth. During various timed trials, the timer began the moment the M&M was placed in front of the child by the research assistant. Behaviors were coded from 0 (*child eats M&M during Part I*) to 10 (*child waits until bell rings to eat M&M*). If the child exhibited multiple behaviors, then the lowest number (most uninhibited behavior displayed) was coded. A composite variable indicating children's overall behavior regulation in the snack delay task was created by standardizing the mean behavior code and the mean proportion time and taking their average. Cronbach's alpha indicated acceptable internal consistency ($\alpha = 0.63$).

Control Variables

Child age, child gender, and father education level were included as control variables.

Analytic Plan

First, descriptive statistics, including the mean, standard deviation, and range, were calculated for variables of interest. Differences in children's self-regulation at Wave 2 by fathers' residential status were evaluated using independent samples *t*-tests.

Second, path analyses were performed using Mplus version 8.4 statistical modeling software (Muthén and Muthén, 2017). Model parameters were estimated with Full Information Maximum Likelihood estimation (FIML) with standard errors that are robust to non-normality (MLR estimator) to examine whether fathers' parenting quality (i.e., authoritative and harsh parenting) and quantity of involvement and supportive coparenting at Wave 1 were associated with children's self-regulation at Wave 2,

while controlling for children's earlier levels of self-regulation and mothers' parenting quality (i.e., authoritative and harsh parenting). Child gender, age, and fathers' education level were also included as control variables. The errors between child age and child self-regulation were correlated, as older children are likely better able to self-regulate. Finally, the errors between supportive coparenting and father involvement at Wave 1 were correlated, as fathers' involvement is greater when supportive coparenting is high (Fagan and Palkovitz, 2019). In line with recommendations to avoid listwise deletion, the variances for remaining ordinal predictors were estimated to address missing data via FIML (Muthén and Muthén, 2017).

Finally, a multi-group path analysis was conducted to determine whether there were differences in the associations between fathers' parenting quality and children's self-regulation by fathers' residential status. Cross-group invariance was assessed by comparing two nested models: (1) a baseline model wherein no constraints are specified (i.e., all parameters are freely estimated) and (2) a second model where the paths of variables of interest are constrained to be equal. A Satorra-Bentler chi-square difference test was used to determine if differences between models were statistically significant.

Several fit indices were used to determine the extent to which the hypothesized model was an adequate fit for the data. Namely, a chi-square test was used to determine model fit, with a non-significant chi-square test indicating acceptable fit. Additionally, the absolute fit of the model was examined using a cutoff of 0.06 the root mean square error of approximation (RMSEA; McDonald and Ho, 2002). Additionally, for comparative fit indices (CFI), a cutoff of 0.95 was considered acceptable (Hu and Bentler, 1999).

RESULTS

Sample Characteristics

Of all eligible fathers who participated in the EDS ($n = 257$), 245 fathers reported information on the focal child's gender. Of these fathers, 139 reported having a male child and 106 reported having a female child. On average, children who participated in Wave 1 of the EDS subsample were age 3.15 years ($SD = 0.91$) and children who participated in Wave 2 of the EDS subsample were age 4.38 years ($SD = 0.91$).

Participating fathers were, on average, 30.2 years of age at Wave 1 ($SD = 7.54$; min = 18 years; max = 53 years). Approximately 45.1% identified as Hispanic, 44.4% identified as non-Hispanic Black or African American, 7.8% of fathers identified as White, and 2.7% identified as non-Hispanic, other. Seventy-seven percent of fathers were born in the United States. Interviews were conducted in Spanish and English. Approximately 63.5% of fathers reported that they were never married, 29.5% percent of fathers reported that they were currently married to the focal child's biological mother, and approximately 7% of fathers reported that they had married the focal child's biological mother at some point but were now separated or divorced. Approximately 31.1% of fathers reported having a high school diploma, 28% reported no diploma,

certification, or degree, 24.5% reported a high school equivalency diploma, 7% reported having a vocational tech diploma, 5.4% reported having an associate's degree, and 3.9% of fathers reported holding a bachelor's degree or higher. Total number of usual hours worked per week across all jobs ranged from 1 h to 96 h per week. On average, fathers reported working 41.7 h per week ($SD = 15.48$). Fathers reported that, on average, their income from all sources last month was \$983 ($SD = 1204.44$).

Preliminary Analysis

Table 1 includes means, standard deviations, and descriptive statistics for all variables of interest grouped by all fathers, resident fathers, and non-resident fathers. On average, children of resident fathers did not have statistically significantly different levels of self-regulation from children of non-resident fathers in the gift wrap [$t(189) = 0.13$, $p = 0.90$] or snack delay tasks [$t(189) = -0.04$, $p = 0.97$] at Wave 2. Intercorrelations among key variables of interest are reported in **Table 2**. Of note, fathers' authoritative parenting behavior was statistically significantly associated with greater levels of self-regulation in the gift wrap ($r = 0.17$, $p < 0.05$) and snack delay tasks ($r = 0.17$, $p < 0.05$) at Wave 1. Fathers' reported hours of involvement at Wave 1 were associated with greater self-regulation in the gift wrap task at Wave 2 at a level that was approaching significance ($r = 0.14$, $p < 0.10$). Coparenting support at Wave 1 was positively associated with children's self-regulation in the gift wrap task at Wave 2 at a level approaching significance ($r = 0.13$, $p < 0.10$). As expected, older children exhibited greater self-regulation in the gift wrap task ($r = 0.36$, $p < 0.01$) and snack delay task ($r = 0.43$, $p < 0.01$) at Wave 2.

Path Analyses Predicting Children's Self-Regulation at Wave 2 From Fathers' Quality of Involvement, Quantity of Involvement, and Coparenting at Wave 1

In the second stage of the analysis, fathers' authoritative parenting, harsh parenting, hours of involvement, and coparenting support were included as predictors of children's self-regulation at Wave 2, while controlling for child self-regulation and mothers' parenting (i.e., authoritative and harsh parenting) at Wave 1. Child gender, age, and fathers' education level were also included as control variables. Fit indices indicated that the model fit the data well [$\chi^2(12) = 13.97$, $p = 0.30$; CFI = 0.979; RMSEA = 0.026].

Fathers' quantity of involvement positively predicted child self-regulation in the gift wrap task ($\beta = 0.11$, $p < 0.05$). Supportive coparenting and fathers' reports of parenting quality did not emerge as statistically significant predictors in either task. Associations among control variables and children's self-regulation were observed. Namely, greater self-regulation in the gift wrap task at Wave 1 was associated with greater self-regulation in the gift wrap task at Wave 2 at a level approaching significance ($\beta = 0.15$, $p = 0.066$). Older children exhibited greater levels of self-regulation in the gift wrap task ($\beta = 0.28$, $p < 0.001$) and snack delay ($\beta = 0.44$, $p < 0.001$) tasks at Wave 2. Female children exhibited greater self-regulation in the snack

TABLE 1 | Means and descriptive statistics of father involvement and child self-regulation by fathers' residential status.

	Range	All fathers			Resident fathers			Non-resident fathers		
		N	M	SD	N	M	SD	N	M	SD
Wave 1										
Self-regulation (observed)										
Snack delay	−1.80 – 1.13	218	−0.04	0.94	95	−0.08	0.97	123	−0.01	0.92
Gift wrap	−1.30 – 1.26	214	−0.01	0.92	93	0.05	0.89	121	−0.06	0.94
Father involvement (father reported)										
Authoritative parenting	2.0 – 4.0	251	3.44	0.41	105	3.39	0.44	146	3.48	0.39
Harsh parenting	1.0 – 4.0	254	2.54	1.06	106	2.59	1.06	148	2.50	1.06
Hours of involvement	0.0 – 168.0	237	38.62	40.61	98	56.86	44.77	139	25.76	31.76
Mother involvement (mother reported)										
Authoritative parenting	1.86 – 4.00	250	3.54	0.41	104	3.59	0.37	146	3.51	0.43
Harsh parenting	1.00 – 4.00	249	2.73	1.08	101	2.71	1.13	148	2.74	1.06
Coparenting										
Support	1.0 – 4.0	236	3.23	0.85	105	3.70	0.43	131	2.86	0.92
Wave 2										
Self-regulation (observed)										
Snack delay	−3.86 – 0.84	191	−0.04	0.91	79	−0.04	0.93	112	−0.04	0.90
Gift wrap	−2.51 – 0.72	191	−0.05	0.92	79	−0.04	0.90	112	−0.06	0.95

Fathers' hours of involvement were standardized in statistical analyses. However, the unstandardized hours are depicted here to facilitate interpretability.

TABLE 2 | Inter correlations among study variables of interest.

Wave 1	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Gift wrap task	–										
2. Snack delay task	0.578**	–									
3. Authoritative parenting (F)	0.173*	0.168*	–								
4. Harsh parenting (F)	0.007	−0.012	0.236**	–							
5. Authoritative parenting (M)	0.138*	0.184**	0.129*	−0.030	–						
6. Harsh parenting (M)	−0.032	0.021	0.098	0.334**	0.014	–					
7. Hours of involvement	0.024	0.088	0.144*	0.200*	−0.014	0.097	–				
8. Support	0.037	0.059	−0.025	0.062	0.078	−0.047	0.300**	–			
Wave 2											
9. Child age	0.476**	0.564**	0.280**	0.014	0.365**	0.066	0.081	0.031	–		
10. Gift wrap task	0.285**	0.343**	0.118	−0.023	0.106	−0.054	0.142 ⁺	0.132 ⁺	0.360**	–	
11. Snack delay task	0.244**	0.281**	0.018	−0.089	0.214**	−0.049	−0.111	−0.013	0.425**	0.350**	–

⁺ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

F = Father and M = Mother.

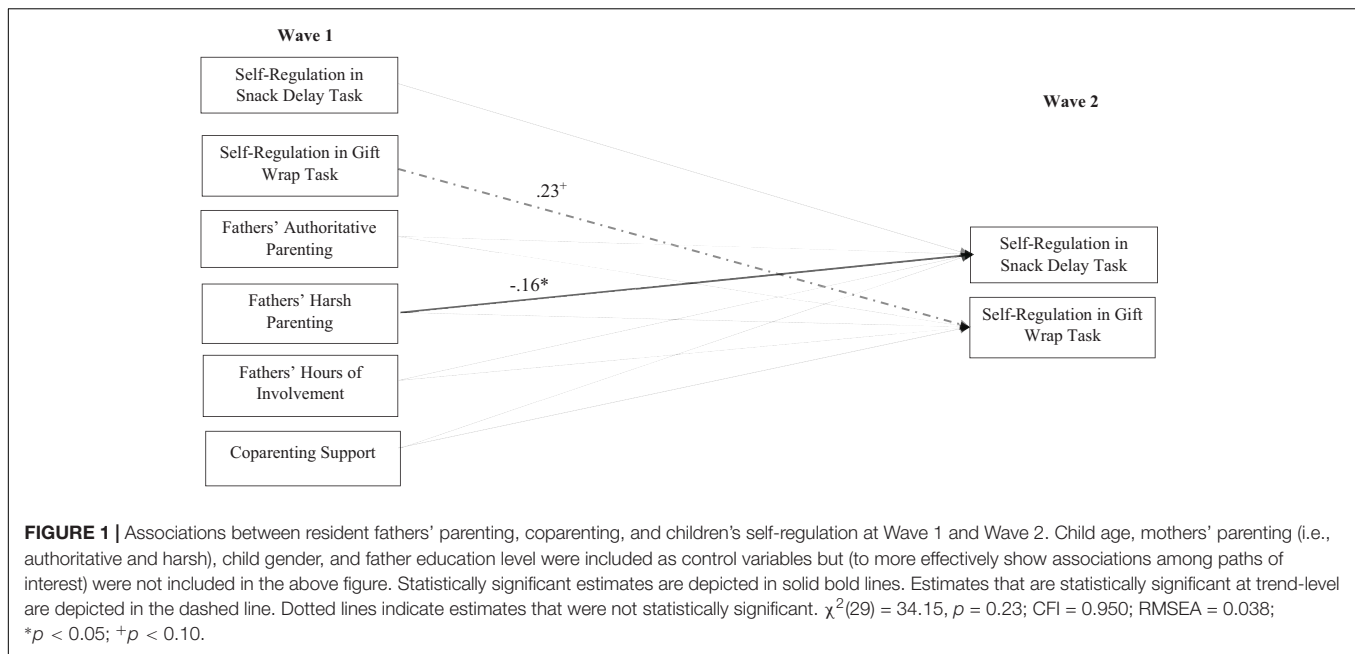
delay task ($\beta = 0.24$, $p < 0.001$). Fathers' education level did not statistically significantly predict child self-regulation in the gift wrap task ($\beta = 0.06$, $p = 0.36$). However, fathers' education level was positively associated with self-regulation in the snack delay task at a level approaching significance ($\beta = 0.12$, $p = 0.053$).

Examining Differences by Fathers' Residential Status

In the third stage of the analysis, multi-group path analyses were conducted to evaluate whether the model fit the data equally well for resident and non-resident fathers. The freely estimated model had acceptable fit [$\chi^2(29) = 34.15$, $p = 0.23$; CFI = 0.95; RMSEA 0.038]. Next, structural paths of interest

were constrained to be equal between resident and non-resident fathers [$\chi^2(44) = 59.70$, $p = 0.057$; CFI = 0.85; RMSEA 0.054]. A Satorra–Bentler chi-square difference test indicated that constraining the structural paths across resident and non-resident fathers resulted in statistically significantly worsening the overall fit of the model [$\Delta\chi^2(15) = 26.21$, $p = 0.0358$], rejecting the null hypothesis that the paths (on the whole) were the same for resident and non-resident fathers. Thus, patterns of association were statistically significantly different between resident and non-resident fathers.

As depicted in **Figure 1**, resident fathers' harsh parenting at Wave 1 statistically significantly predicted lower levels of self-regulation in the snack delay task at Wave 2 ($\beta = -0.16$, $p < 0.05$). Supportive coparenting was not statistically significantly



associated with child self-regulation in the snack delay ($\beta = 0.09, p = 0.32$) or gift wrap ($\beta = -0.04, p = 0.65$) tasks. Additionally, resident fathers' quantity of involvement was not associated with child self-regulation in the snack delay ($\beta = -0.12, p = 0.27$) or gift wrap tasks ($\beta = 0.05, p = 0.53$). Child age remained a statistically significant predictor of child self-regulation in the snack delay ($\beta = 0.38, p < 0.01$) and gift wrap tasks ($\beta = 0.22, p < 0.05$). Female children exhibited greater self-regulation in the snack delay task ($\beta = 0.35, p < 0.01$). Fathers' education level did not emerge as a statistically significant predictor of child self-regulation in either task.

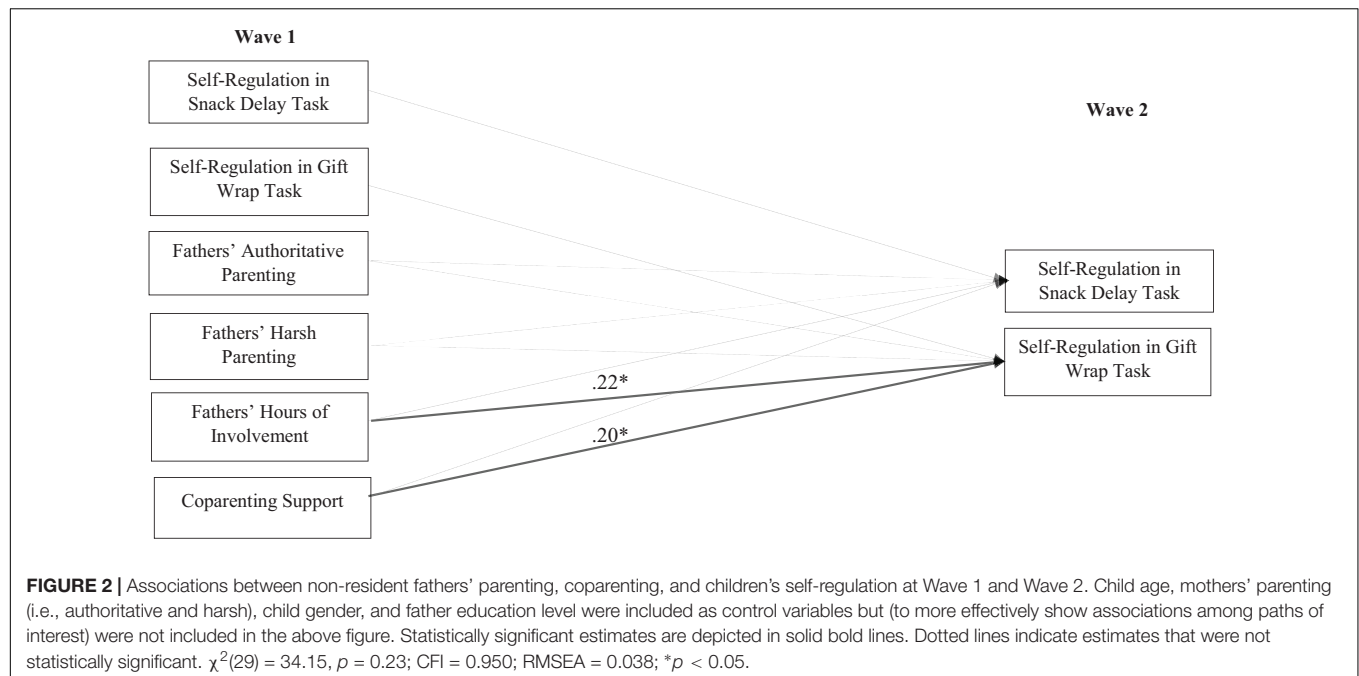
As depicted in **Figure 2**, non-resident fathers' reported hours of involvement at Wave 1 statistically significantly predicted greater child self-regulation in the gift wrap task at Wave 2 ($\beta = 0.22, p < 0.05$). Additionally, supportive coparenting at Wave 1 predicted greater child self-regulation in the gift wrap task at Wave 2 ($\beta = 0.20, p < 0.05$). Child age remained a statistically significant predictor of child self-regulation in the snack delay ($\beta = 0.52, p < 0.01$) and gift wrap tasks ($\beta = 0.37, p < 0.01$). Female children exhibited greater self-regulation in the snack delay task ($\beta = 0.14, p < 0.05$) and the gift wrap task at a level approaching significance ($\beta = 0.16, p = 0.053$). Fathers' education level predicted greater child self-regulation in the snack delay task ($\beta = 0.19, p < 0.05$) but not the gift wrap task.

DISCUSSION

The development of children's self-regulation, occurring from birth through children's early preschool and elementary years, has significant implications for subsequent adjustment, including better academic achievement and peer relationships in middle childhood and beyond. Scientists have made significant strides in understanding associations between mothers' parenting and

child self-regulation in recent years. However, surprisingly few studies have examined the role of coparenting and fathers' parenting (Roggman et al., 2013). Furthermore, when study resources are limited, low-income and non-resident fathers are often overlooked due to the difficulty of recruiting, tracking, and following-up. The primary purpose of this study was to investigate fathers' parenting quality (i.e., authoritative and harsh parenting behaviors), quantity of involvement, and supportive coparenting as predictors of children's self-regulation in a sample of families facing economic hardship.

Fathers' parenting quality and quantity of involvement predicted greater child self-regulation. However, the associations between fathers' reports of parenting quality (i.e., authoritative and harsh parenting), quantity of involvement, and children's self-regulation varied by fathers' residential status. For non-resident fathers, authoritative and harsh parenting were not linked to children's self-regulation. In contrast, reports of fathers' quantity of involvement were positively associated with better self-regulation in children. This finding was somewhat unexpected, as prior meta-analyses have indicated non-resident fathers' quality of involvement is more closely tied to positive child outcomes than quantity of father involvement (Adamsons and Johnson, 2013). However, this study's unique aspects may contextualize this difference. First, this study relied on fathers' perceptions of their involvement, whereas most studies rely on mothers' perceptions of non-resident father involvement. Second, this is the first study (to the author's knowledge) to consider longitudinal associations between non-resident fathers' perceptions of their involvement and observed child self-regulation. Perhaps non-resident fathers' quantity of involvement is a more salient predictor of child self-regulation than other developmental outcomes (i.e., academic performance and social-emotional adjustment). Nevertheless, this finding aligns with the view that non-resident fathers' quantity of involvement is



important to consider when promoting positive child outcomes (Adamsons, 2018).

How involved were non-resident fathers? On average, non-resident fathers reported 25.76 h of involvement per week in the current study. However, it is difficult to directly compare the hours of involvement reported in this study and other studies of non-resident father involvement due to differential question phrasing and respondents. Studies examining father involvement among low-income, non-resident United States fathers (i.e., Choi et al., 2014) have typically relied on mothers' reports of non-resident fathers' frequency of contact with the child. Information about non-resident father involvement are often obtained via ordinal surveys or open-ended questions over a longer duration of time (i.e., "How many days has father seen child during the past 30 days?"). Thus, it is challenging to make direct comparisons between non-resident father involvement in this study and prior research. As families become increasingly diverse, researchers should more thoroughly examine non-resident father involvement across various contexts.

Findings also indicated, for resident fathers, harsh parenting behaviors were longitudinally associated with decreased self-regulation in children. Resident fathers' quantity of involvement, in contrast, was not statistically significantly associated with children's self-regulation. Although this study is unique in its focus on low-income, biological fathers, this finding is consistent with other research indicating that greater harsh parenting among adoptive fathers was associated with lower child self-regulation (Bridgett et al., 2018). In longitudinal research that has focused on mothers' parenting, greater maternal warmth and low levels of physically punitive discipline emerged as predictors of children's greater capacity for self-regulation in middle childhood (Colman et al., 2006).

It is important to note that the parenting behaviors included in the harsh parenting measure focused exclusively on spanking behavior. On average, parents in the United States report spanking at higher rates than parents in other industrialized nations. Spanking, in turn, has predicted greater social-emotional difficulties in early childhood (Pace et al., 2019). Fathers' spanking, in particular, has been linked to increased aggression in preschool-aged children (Lee et al., 2013). Furthermore, prior research using data from the Family Life Project (i.e., low-income, rural children) found that fathers' negativity was more closely tied to child stress regulation than positive parenting behaviors (Mills-Koonce et al., 2011). Thus, this study contributes to a growing body of research highlighting the negative consequences of fathers' harsh parenting behaviors.

It may also be important to consider the context in which harsh parenting behavior is delivered. For example, researchers have suggested that the consequences of harsh parenting for child maladjustment depend on whether discipline is delivered in an emotionally charged or controlled manner (Chang et al., 2003). Thus, more detailed information on the nature in which fathers' harsh parenting is delivered might provide further insight into its role in the development of children's self-regulation. Additionally, when multiple harsh parenting behaviors co-occur, children may be most at risk for self-regulation difficulties (see Mills-Koonce et al., 2016).

Notably, the reported associations between fathers' quantity and quality of involvement were statistically significant even when controlling for mothers' parenting quality and earlier levels of child self-regulation. Thus, these data would suggest that, for children with a non-resident father, fathers' quantity of involvement is important for developing children's self-regulation. Additionally, harsh parenting may be particularly detrimental when fathers live with the child. However, findings

may not generalize to all fathers. That is, *any* type of involvement is not necessarily beneficial for the development of children's self-regulation. In some cases, mothers report engaging in gatekeeping behavior, or attempting to discourage and limit fathers' opportunity for involvement in childrearing, because fathers pose a threat to the child's health and well-being (Zvara et al., 2016).

Finally, this study was among the first (to the author's knowledge) to examine whether associations between supportive coparenting and child self-regulation varied by fathers' residential status. Supportive coparenting emerged as a predictor of child self-regulation among children with a non-resident father. However, supportive coparenting did not predict child self-regulation among children with a resident father. Thus, in line with the emotional security hypothesis (Davies et al., 2002), supportive coparenting may be especially important in contributing to a positive emotional climate in the home when fathers are non-resident. Perhaps in these situations parents who have positive coparenting relationships can set aside personal disagreements and differences and prioritize taking a team-oriented approach to childrearing. As a result, parents who support each other's parenting strategy can cultivate a calm and respectful atmosphere. This favorable climate supports children's sense of security and emerging self-regulation skills.

Importantly, this study focused exclusively on resident and non-resident United States fathers facing economic hardship. In the United States, the percentage of children living with two parents versus a single parent varies dramatically based on family socioeconomic status, with a greater proportion of non-resident fathers among lower socioeconomic status families. Therefore, study findings should be interpreted cautiously when considering how they might generalize to higher socioeconomic statuses. An emerging area of research has examined whether the effects of non-resident father involvement are stronger for children in low-SES households compared to high-SES households. Results have indicated that non-resident father involvement was similarly positive for child outcomes regardless of family SES (Tanskanen and Erola, 2017; Miller et al., 2020). Thus, it is expected that non-resident father involvement would be similarly beneficial for children in higher-SES families.

Although this study provides important insight into resident and non-resident fathers' parenting and children's self-regulation, study limitations should be addressed. The non-resident fathers who agreed to participate in this study were, on the whole, more involved in their children's lives than fathers who declined participation. In addition, mothers provided contact information for non-resident fathers. Thus, it is likely that the coparenting relationship between parents was stronger in cases where mothers provided contact information and fathers agreed to participate, compared to situations in which mothers refused to give the researchers fathers' contact information. Indeed, in some cases, mothers refused to provide contact information because fathers were in prison, mothers were afraid fathers would be mad at them, or mothers did not want fathers to be involved in any part of the child's life. Additionally, in the United States, there are various types of non-resident fathers (including non-resident fathers who live out of state). Future research is needed

to determine how non-resident fathers who see their child infrequently, but use technology to stay in touch, may contribute to child self-regulation.

A second limitation is that the reliabilities for fathers' perceptions of their parenting quality (i.e., authoritative and harsh parenting) were lower than for mothers' perceptions. In studies that include both mothers' and fathers' parenting measures, it is common to see lower reliability among fathers. This discrepancy may occur because researchers apply measures that have been developed and validated on mothers to fathers (Roggman et al., 2012). Many of the parenting measures were built around conceptions of mothers' parenting—often referred to as the “maternal template” (Marsiglio et al., 2000). Family systems researchers primarily rely on measures originally developed on mothers to assess fathers' parenting because this approach enables a more direct comparison between mothers and fathers (Fagan et al., 2014).

Third, the measure of father involvement assessed fathers' perceptions of their quantity of involvement via a single question. In general, time diaries are considered a more thorough method for assessing involvement. However, notwithstanding this limitation, this study is unique in its inclusion of fathers' perceptions of their *own* quantity of involvement. Thus, this study expands upon existing research (i.e., Choi et al., 2014), which has relied more often on mothers' reports of non-resident father involvement.

There are several avenues for future research. Although several parenting programs focus on building positive relationships among non-resident fathers and their children, efforts targeted at improving the measurement of non-resident fathers' parenting have lagged. Researchers are only just beginning to develop and validate measures of parenting on non-resident fathers (i.e., Dyer et al., 2018). Better assessing the nature of non-resident father involvement is necessary for informing parenting programming and intervention efforts. Additionally, non-resident fathers may contribute to child outcomes through other pathways, such as child support payments. When fathers are experiencing economic hardship, it may be especially challenging to comply with child support arrangements, which may lead to conflict in the coparenting relationship.

Finally, father figures—including stepfathers and maternal boyfriends—may contribute to children's self-regulation. Although there were some stepfather and boyfriend father figures identified at Wave 1, the sample size was too small to make meaningful comparisons between children with a stepfather or maternal boyfriend father figure and children without one. Future research focusing more specifically on the role of father figures and non-resident fathers to the development of young children's self-regulation may yield important insights.

Despite some limitations, this study supports increasing interest in policies and programs that promote father involvement. In particular, one way to support non-resident father involvement may be to increase the availability of paternity leave. Paternity leave may provide an opportunity for fathers to develop a secure attachment bond, establish a routine with their baby, and develop a strong coparenting foundation. Non-resident fathers who take paternity leave

are more involved and more likely to look after the child when the mother needs assistance (Knoester et al., 2019; Pilkauskas and Schneider, 2020).

Furthermore, several educational efforts may help practitioners and clinicians reduce harsh discipline practices among parents. For example, showing parents research findings on the adverse effects of spanking reduces the view that spanking is an appropriate discipline strategy (Holden et al., 2014). In addition, pediatricians are often trusted sources for parents. Therefore, providing brief education in waiting rooms regarding the consequences of harsh discipline strategies may prove beneficial.

In sum, this study contributes to emerging research examining associations between fathers' parenting quality and quantity of involvement, coparenting, and children's subsequent self-regulation. The development of children's self-regulation, occurring from birth through children's early preschool and elementary years, has significant implications for subsequent adjustment, including better academic achievement and peer relationships during middle childhood and beyond (Blair and Razza, 2007). By controlling for mothers' parenting quality and children's earlier self-regulation, this study offers insights into what aspects of the family system best support child self-regulation—especially in the context of economic hardship.

DATA AVAILABILITY STATEMENT

Publicly available datasets were analyzed in this study. This data can be found here: <https://www.icpsr.umich.edu/web/DSDR/studies/4701/>.

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ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Penn State University (PSU). PSU determined that the study does not meet the definition of human subjects research as the data were not restricted, deidentified, and no code list was shared (STUDY0018723). Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

This manuscript and its contents are solely the responsibility of LA and do not necessarily represent the official views of The Pennsylvania State University.

ACKNOWLEDGMENTS

This research uses data from the publicly available Three-City Study. The Three-City Study was conducted with support from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (R01HD036093), the National Institutes of Health, and the United States Department of Health and Human Services. Additional support from other foundations and federal agencies was also provided. LA did not receive any support from these entities. Only publicly-available, secondary data were analyzed.

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Untangling Caregiving Role From Parent Gender in Coparenting Research: Insights From Gay Two-Father Families

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Keywords: coparenting, caregiving roles, parent gender, gay fathers, parenting, sexual minority parent families, parent involvement in childcare, unpaid labor

INTRODUCTION

Research suggests that heterosexual fathers display similar parenting behaviors as heterosexual mothers, and have an analogous influence on children's development (Fagan et al., 2014; Volling and Cabrera, 2019; Volling and Palkovitz, 2021). However, claims that heterosexual fathers make a unique contribution to children's development (Jeynes, 2016) persist, often attributed to evolved differences between males and females (Paquette, 2004). Additionally, heterosexual mothers and fathers typically take on distinct coparenting roles, with mothers assuming more non-paid tasks (e.g., Yavorsky et al., 2015) and devoting two to three times as much time with their children, relative to fathers (Cabrera et al., 2018).

The increasing number of gay two-father families worldwide (Blake et al., 2017; Berkowitz, 2020; Carone et al., 2021) may allow us to expand our theoretical understanding of coparenting and child development within diverse family structures. Uniquely, gay two-father families involve two fathers and no mother, and both parents have a non-heterosexual orientation. Additionally, depending on whether surrogacy or adoption was used, either one or two of the fathers is biologically unrelated to their child, respectively. Accordingly, research with gay two-father families promises novel and significant insight into coparenting dynamics.

To date, with few exceptions (e.g., Farr and Patterson, 2013; Tornello et al., 2015; Carone et al., 2017; Farr et al., 2019; van Rijn-van Gelderen et al., 2020), coparenting research has focused on heterosexual two-parent families with biological children (Feinberg, 2003; McHale, 2011). In such families, caregiving roles are generally defined according to parent gender. Potential variations in coparenting according to parents' sexual orientation and parent-child (non-)biological relatedness (and the interaction between these factors) have not been addressed. Since research has documented the unique predictive power of coparenting for child adjustment across developmental stages (Teubert and Pinquart, 2010), it seems fundamental to examine the extent to which coparenting is influenced by parent gender and caregiving role, while accounting for the contribution of parent sexual orientation and biological (non-)relatedness.

This opinion article presents an overview of recent findings relating to gay fathers (through adoption and surrogacy) to differentiate the effects of caregiving role and parent gender, identifying the unique and joint contributions of these factors to coparenting behaviors. Given that less research about coparenting has focused on gay fathers than lesbian mothers, where relevant, studies with the latter group are also included.

OPEN ACCESS

Edited by:

Leonardo De Pascalis,
University of Liverpool,
United Kingdom

Reviewed by:

Damien W. Riggs,
Flinders University, Australia

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Specialty section:

This article was submitted to
Gender, Sex and Sexualities,
a section of the journal
Frontiers in Psychology

Received: 26 January 2022

Accepted: 21 February 2022

Published: 16 March 2022

Citation:

Carone N and Lingiardi V (2022)
Untangling Caregiving Role From
Parent Gender in Coparenting
Research: Insights From Gay
Two-Father Families.
Front. Psychol. 13:863050.
doi: 10.3389/fpsyg.2022.863050

THE (IR)RELEVANCE OF PARENT GENDER FOR COPARENTING

Heterosexual women's participation in the labor force, and their associated political and social achievements, have increased over recent decades. However, in heterosexual two-parent families, these gains have not translated into a more egalitarian allocation of household labor (Lachance-Grzela and Bouchard, 2010). This is true also among highly educated couples, with both partners employed full-time (Cabrera et al., 2018). This contrasts the relative resource theory (Blood and Wolfe, 1960), which predicts that the division of parenting tasks results mainly from differences in parental resources. Another explanation for this pattern relies on the gender roles and gender ideology, which are embedded societally and internalized and enacted during coparenting (Lachance-Grzela and Bouchard, 2010).

As gay fathers are less susceptible to pressure to conform to gender roles, they may be more likely than heterosexual couples to contribute equally to coparenting. A U.S.-based study comparing 29 gay, 25 lesbian, and 50 heterosexual adoptive couples on coparenting practices with 3-year-old children showed that the gay and lesbian couples were more likely to share parenting tasks evenly than the heterosexual couples (Farr and Patterson, 2013). In the follow-up study in middle childhood, no differences in coparenting emerged across family types (Farr et al., 2019). However, a Canadian study with 92 adoptive gay fathers with children aged 1–9 years concluded that gender roles may predict overall involvement in childcare, as the fathers who reported higher femininity were most involved (Feugé et al., 2019).

This last result opens space for further reflecting on what “femininity” (and “masculinity”) stand for in coparenting. Said differently, it might be that the greater involvement of “more feminine” fathers does not have so much (or not only) to do with gender roles as it has to do with psychic identifications with (co)parenting functions experienced in their own family of origin? We are thinking here on Kentlyn's (2007) result that, for many gay and lesbian parents who did more household labor, it was like “coming back to the base”, that is to their internalized maternal function. This is not to perpetuate rigid stereotypes of femininity and masculinity and, consequently, what is expected from mothering and fathering. Rather, we aim at stimulating more reflections on the influence of internalized early relational experiences on the distribution of household labor as adults. In this vein, further research on the interaction between gender roles and identifications with parenting functions would shed light on a much less explored part of the coparenting story.

Looking at coparenting among heterosexual mothers and fathers, social structural theory (Eagly and Wood, 1999) offers an alternative explanation of differences between them, arguing that “the roles people occupy—which may be due to individual choice, sociocultural pressures, or biological potentials—lead them to develop psychological qualities and, in turn, behavior to fit those roles” (Katz-Wise et al., 2010, p. 2). From this perspective, biological differences between mothers and fathers (especially related to experiences of pregnancy, birth, and breastfeeding) may determine that heterosexual mothers spend more time

engaging in childcare relative to heterosexual fathers. This view was supported by a study on task division involving lesbian mothers, showing that biological mothers tended to invest more time in childcare than non-biological mothers with children aged 3 months (Goldberg and Perry-Jenkins, 2007). Studies with older children of lesbian mothers, however, have produced mixed findings (e.g., Chan et al., 1998; Bos et al., 2007; Downing and Goldberg, 2011), suggesting that lesbian mothers may have a more flexible caregiving division that changes over time.

Among gay fathers through surrogacy, biological relatedness seems unrelated to levels of involvement in household and childcare tasks (Tornello et al., 2015; van Rijn-van Gelderen et al., 2020). However, it may matter for the conflictual dimension of coparenting, as an Italian study (Carone et al., 2017) found that non-biological fathers reported less undermining coparenting compared to biological fathers. This contradicts the theory of selection (Hamilton, 1964), which assumes that altruistic behavior is adaptive when it increases genetic fitness; thus, due to the economic, physical, and mental costs of raising a child, biological gay fathers should invest more in childcare relative to non-biological gay fathers.

A further variable to consider is parents' time spent outside the home: according to time-constraint theory (Artis and Pavalko, 2003), the parent who spends more hours at work and engaging in external activities will have less time to invest in household and childcare tasks. Indeed, Patterson et al. (2004) found that lesbian mothers spent the same number of hours in paid employment and were equally involved in childcare, while heterosexual fathers spent twice as many hours in paid employment as did their female partners, resulting in the mothers being more intensively involved in childcare.

The results with gay fathers have varied. A U.S. study with 335 gay fathers through different paths to parenthood found that the father who worked fewer hours in paid employment relative to their partner performed more of the household and childcare labor. Conversely, in Feugé et al.'s study of adoptive fathers (Feugé et al., 2019), no relation was found between parental involvement (including perceived involvement) and hours devoted to paid work.

By definition, heterosexual two-parent families and gay two-father families differ. We cannot ignore the function played by parent gender in organizing coparenting in heterosexual two-parent families, as a result of historical, socio-cultural, and political factors (Lachance-Grzela and Bouchard, 2010). On the other hand, studies on coparenting among gay fathers have not yet produced firm indications. Nonetheless, they invite us to “look beyond the hood” of parent gender to capture a broader array of factors that might influence coparenting behaviors and determine “how mothers and fathers are similar, different, complementary, or additive” (Cabrera et al., 2018, p. 3). Caregiving role might be one of those factors.

FATHERS AS PRIMARY CAREGIVERS

Cultural shifts in norms of masculinity and femininity have encouraged a growth in the number of primary

caregiving heterosexual fathers (i.e. “stay-at-home fathers”) (Solomon, 2014). These fathers are shifting away from traditional/hegemonic forms of masculinity and embracing more nurturing forms of fathering (Hunter et al., 2017). However, in their attempts to integrate into the “parenting space” that has traditionally been occupied by mothers, they are experiencing stigmatization (Coltrane et al., 2013) and “gender discrepancy strain” (Pleck, 1995). Future research should consider whether these challenges are reducing the quality of their coparenting.

Although heterosexual fathers are increasingly embracing the role of primary caregiver and heterosexual mothers are increasingly taking on the role of primary earner (Schoppe-Sullivan and Fagan, 2020), in the majority of heterosexual two-parent families, mothers still remain more engaged in childcare. In gay two-father families, the distinction between primary and secondary caregiver is not always marked; as a result, researchers must sometimes randomly assign the primary caregiving role to one father (van Rijn-van Gelderen et al., 2020) or label both fathers primary caregivers (Ellis-Davies et al., 2022). Thus, gay two-father families are encouraging a redefinition of caregiving roles, as parental gender is no longer the defining criterion.

Emerging attachment research with gay two-father families (Feugé et al., 2019; Carone et al., 2020; Ellis-Davies et al., 2022) has contributed promising and novel insights that can be extended to coparenting. In heterosexual two-parent families, Bretherton (2010) found that mothers and fathers differentiate their attachment roles such that mothers primarily address safe haven needs whereas fathers primarily support secure exploration. Kerns et al. (2015) further showed the different—somewhat complementary—roles played by mothers and fathers as attachment figures.

Nevertheless, one key question arising from such attachment research (e.g., Bretherton, 2010; Kerns et al., 2015) is whether—and to what extent—children’s tendency to use mothers as safe havens and fathers as secure bases is due to a conflation between caregiving role and parental gender. To address this, we studied 33 gay two-father families through surrogacy and 37 lesbian two-mother families through donor insemination, with children aged 6–12 years (Carone et al., 2020). Our aim was to investigate how children used their parents to fulfill safe haven and secure base needs, comparing family groups in which the parents were of the same gender, only one parent was biologically (non-)related to their child, and caregiving roles were likely to be shared equally.

The results indicated that, irrespective of family type, children used the primary caregiver more as a safe haven and the secondary caregiver more as a secure base, though they reported high levels of both types of support from both parents. This suggests that, when children’s attachment needs cannot be obviously addressed on the basis of parent gender, caregiving roles may explain variations in child–parent interactions. From a psychodynamic perspective, this implies that each parent, regardless of their gender, remains a fundamental attachment figure who transmits their internal model of relationships to their child through parenting behavior, partly independent of the other parent’s actions (Fonagy et al., 1994; Steele et al., 1996). Through this mechanism, the child develops and maintains distinguishable

mental representations of the expected relationship with each parent, and these representations combine into an integrated view of attachment relationships as the child matures (Fonagy et al., 1994).

Additional support for the relevance of caregiving role over parent gender comes from a recent neurobiological parenting study. Abraham et al. (2014) compared the brain activity of primary caregiving gay fathers through surrogacy with that of primary caregiving heterosexual mothers and secondary caregiving heterosexual fathers through unassisted conception, all of whom were first-time parents of infants. While the heterosexual mothers and heterosexual fathers showed heightened activity in brain areas associated with emotion processing and cognitive processing, respectively, gay fathers showed increased activity in both of these regions. This indicates that primary caregiving gay fathers may respond similarly to both heterosexual mothers and fathers and that, in turn, the caregiver role might be relevant to fathers’ and mothers’ parenting qualities. Future research should include secondary caregiving gay fathers, primary caregiving lesbian mothers, and secondary caregiving lesbian mothers to capture potential interactions between caregiving role and parent gender in brain area activation during parenting (Giannotti et al., 2022).

DISCUSSION

The prevailing coparenting model in heterosexual two-parent families positions fathers as “helpers” to mothers (Cabrera et al., 2014, 2018; Schoppe-Sullivan and Fagan, 2020). Most coparenting research considers the mother the primary caregiver (and thus the representative parent in the family), because mothers typically spend more time with children than do fathers (Cabrera et al., 2018). However, the exclusion of fathers from coparenting research on this basis, and the subsequent use of mothers’ reports only, contradict evidence that the quality of the parent–child relationship is more important than the quantity of parental involvement (Pleck, 2010). It also lacks ecological validity, since it systematically obscures families’ actual daily experience. Thus, if our goal is to understand the effects of coparenting and the parent–child relationship on child development, an exclusive focus on mothers risks overestimating their effect (Schoppe-Sullivan and Fagan, 2020).

Our overview of studies involving gay fathers warns against an assumed overlap of caregiving role and parent gender, and stresses the need to consider these factors independently, also in heterosexual two-parent families. Researchers should ask mothers and fathers how they manage caregiving responsibilities, instead of assuming a-priori gender-based divisions, as well as explore the coparenting model they have experienced and internalized during childhood as it may reflect in their coparenting relationships as adults. Additionally, they should explore children’s perceptions of their parents’ caregiving roles. As such perceptions result from parents’ transmission of their internal model of parenting, socialization practices, and actual parenting behaviors, they may differ—to some degree—from parents’ own perceptions. In a similar vein, future research should

investigate whether coparenting behaviors in heterosexual two-parent families develop from the complementary caregiving roles adopted by mothers and fathers, rather than the differentiation between women and men, respectively. Finally, cross-cultural research is needed to verify whether culture also contributes to the overlap of parent gender and caregiving role.

Further research might also compare families with a primary caregiver mother and a secondary caregiver father to families with a primary caregiver father and a secondary caregiver mother, to determine whether parent gender or parents' adoption of complementary roles explains different coparenting behaviors. Such a comparison could illuminate the unique and joint contributions of parent gender and caregiving role on child development through coparenting. In addition, coparenting research with parents of diverse genders and sexual orientations, as well as parents with biological (non-)relatedness to children, could contribute to either substantiating or disconfirming the notion that fathering and mothering are unique constructs (Fagan et al., 2014; Jaynes, 2016) and clarify whether—and under which circumstances—caregiving role and parent gender interact and, in turn, determine coparenting dynamics.

As a final remark, caregiving roles vary according to individual, couple, family, and contextual circumstances. For this reason, policies such as shared parental leave and flexible working have a significant impact on coparenting quality among heterosexual couples (e.g., Lidbeck and Bernhardsson, 2021), and

should be widely promoted by governments and employers to support gender equality within families. During the COVID-19 lockdowns, heterosexual fathers' contributions to unpaid childcare increased, though heterosexual mothers still spent much more time on childcare relative to fathers (e.g., Andrew et al., 2020; Farré et al., 2020; Manzo and Minello, 2020). If homeworking continues into the long term and increasingly influences the (in)balance between heterosexual mothers and fathers in childcare, the untangling of caregiving role and parent gender will be fundamental for identifying more nuanced coparenting dynamics (e.g., similar parenting behaviors for both parents, more prevalent behaviors at a specific time, behaviors done by a specific parent, and behaviors that produce specific outcomes).

AUTHOR CONTRIBUTIONS

NC and VL substantially contributed to the conception of the manuscript. NC drafted the manuscript and VL revised it critically for important intellectual content. Both authors approved the manuscript for publication.

FUNDING

This work was supported by the Ministry of University and Research under the call Progetti di Rilevante Interesse Nazionale (PRIN) 2017 (project number 2017XNYB9C).

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The Role of Paternal Parenting and Co-parenting Quality in Children's Academic Self-Efficacy

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OPEN ACCESS

Edited by:

Lauren Altenburger,
Penn State Shenango, United States

Reviewed by:

Ana Conde,
Portugalense University, Portugal
Mirjam Kalland,
University of Helsinki, Finland

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Specialty section:

This article was submitted to
Gender, Sex and Sexualities,
a section of the journal
Frontiers in Psychology

Received: 07 September 2021

Accepted: 21 February 2022

Published: 21 March 2022

Citation:

Kara D and Sümer N (2022) The
Role of Paternal Parenting and
Co-parenting Quality in Children's
Academic Self-Efficacy.
Front. Psychol. 13:772023.
doi: 10.3389/fpsyg.2022.772023

This study explored the unique effect of fathers' parenting behaviors and the quality of co-parenting described as the degree of consistency between paternal and maternal parenting behaviors on children's academic self-efficacy. The power of both pancultural parenting behaviors (i.e., emotional warmth and rejection) and specific parenting controlling behaviors that are relatively common in Turkish culture (i.e., intrusion and guilt induction) in predicting academic self-efficacy was tested. A total of 1,931 children completed measures of parenting behaviors and academic self-efficacy in math and literature courses in their school. Overall, girls reported higher levels of literature self-efficacy, whereas boys reported higher levels of math self-efficacy. Compared to boys, girls perceived higher levels of positive parenting behaviors from both their fathers and mothers. The results of the regression analyses showed that, whereas father warmth had stronger effects on boys' math self-efficacy, mother warmth had stronger effects on girls' literature self-efficacy. Examination of the effects of co-parenting quality demonstrated that children with positively consistent parents (i.e., both parents having high positive and low negative parenting behaviors) reported the highest level of academic self-efficacy, whereas those having negatively consistent parents had the lowest level of academic self-efficacy. Analyses on inconsistent co-parenting, however, yielded compensatory effects, which were similar to positively consistent parents, and deterioration effects, which were similar to negatively consistent parents depending on the gender of parent and child, domain of parenting behavior, and academic efficacy. This study contributed to the current literature by showing the unique role of fathers over and beyond mothers, and confirmed the importance of positive parenting and parenting consistency in promoting children's academic efficacy. Cultural and practical implications of the findings were discussed.

Keywords: fathers, paternal and maternal parenting behaviors, parenting consistency, coparenting, academic self-efficacy

INTRODUCTION

Because of rapid social changes, especially in women's status, fathers' traditional gendered role as breadwinners and conveyers of moral values have been globally transformed into more egalitarian roles (Lamb, 2000). Consequently, fathers have been more active in caregiving and co-parenting in recent decades (Jones and Mosher, 2013; National Survey of Family Growth, 2017). Today's fathers are more emotionally available, and their role in child development has evolved beyond only providing material or instrumental support (Cabrera et al., 2000; Lamb, 2000). These changes have been mostly achieved with recent attempts calling attention to fathers' role and the importance of their engagement in raising children. For instance, past studies have documented that children show substantial progress when fathers are actively involved in their children's academic-related topics. In a recent meta-analysis, Kim and Hill (2015) found that both fathers' and mothers' educational engagement contributed to student achievement. Similarly, Jeynes (2015) showed that father involvement predicted academic and psychological outcomes from kindergarten to undergraduate years. Past studies, however, have not examined the unique effect of fathers, compared to mothers, as well as effects of parental consistency as an indication of co-parenting quality on school children's academic self-efficacy. Thus, in this study, with an emphasis on paternal parenting, we explored the effect of two universal (relatively pancultural) parenting behaviors, namely, emotional warmth and rejection, and two parental psychological controlling behaviors, intrusion and guilt induction, which are relatively common in the Turkish context on children's academic self-efficacy. We expected that girls' and boys' perceptions of positive, negative, and (in)consistent paternal and maternal behaviors would have distinct effects on their academic self-efficacy.

Specifically, the first aim of this study was to extend fathering literature by investigating the unique contribution of paternal parenting behaviors in the effect of maternal behaviors. The second goal was to examine if and how children's level of academic self-efficacy in math and literature courses changes as a function of co-parenting quality considering (in)consistency between paternal and maternal behaviors. We tested our hypothesis separately for girls and boys.

Unique Role of Fathers

The visibility of fathers in child development is growing. Fathers are publicly informed about positive impacts of their presence on child functioning (Cabrera and Peters, 2000). Community programs and policies take serious actions to encourage fathers to become more involved in their children's lives (Tully et al., 2017). A past study has extensively documented fathers' critical role in children's cognitive, social, and educational developments across cultures and developmental periods (see Jeynes, 2015; Rollè et al., 2019 for reviews). For instance, in the United States, early adolescents having involved fathers have lower levels of internalizing and externalizing problems compared to those with uninvolved fathers (Day and Padilla-Walker, 2009). Similarly, among Mexican immigrant families,

although mothers spend more time with childcaring, fathers' time spent in academic care increases children's academic performance (Hossain and Shipman, 2009). Overall, father and mother involvement were equally associated with students' academic achievement (Kim and Hill, 2015). Past studies conducted in the Turkish context also supported the positive impact of father involvement. For instance, the quality of father-daughter relationship was a strong predictor of adolescents' well-being (Sağkal et al., 2018). Moreover, both mothers' and fathers' parenting behaviors separately predicted primary school students' academic performance, although mother effect was stronger (Erdoğan, 2007).

A previous study has suggested a number of qualitative and quantitative differences between fathers' and mothers' roles in various child outcomes across developmental stages. For instance, Chen et al. (2000) found that mothers and fathers contributed to different developmental outcomes in the Chinese context, whereas maternal warmth was related to child emotional adjustment, paternal warmth was related to social and academic achievements. Verhoeven et al. (2012) found that mother and father parenting dimensions had unique effects on child anxiety across different periods; maternal over-control was more predictive of anxiety in early years, whereas paternal over-control was more predictive during adolescence. In another study, Lv et al. (2018) examined the effect of parental involvement on children's multidimensional (i.e., academic, emotional, and social) self-efficacy profiles. They found that the effect of fathers' and mothers' educational aspirations varies across different self-efficacy profiles. Fathers' educational aspirations predicted children's high self-efficacy profiles, while mothers' educational aspirations prevented children to be in the low level of self-efficacy profile. These observed differences seem to stem from different functions of maternal and paternal parenting goals and strategies. Mothers mainly focus on providing emotional support and nurturing, while fathers mostly provide guidance to their children about future behaviors (Jeynes, 2016). In a meta-analytic study, Jeynes (2015) showed that although both fathers and mothers affect child development through different pathways, fathers' unique role was held for both younger and older children as well as for girls and boys, especially in academic achievement.

Documented differences between mother and father effects may depend on the way children relate to their parents. For instance, Turkish adolescents perceive different levels of affection, control, autonomy, and discipline from their parents. Children perceive their mothers as more affectionate than their fathers, while they perceive their fathers as more controlling, disciplining, and autonomy-granting than their mothers (Sunar, 2009). One of Turkey's largest foundations supporting positive parenting, AÇEV [Mother Child Education Foundation (Anne Çocuk Eğitim Vakfı, 2017)] published a comprehensive report titled "Involved fatherhood and its determinants in Turkey" in 2017. This report shows that traditional fatherhood defined with characteristics of patriarchal authoritarian parenting is still common in Turkey. However, there also exists an emerging *new traditional fatherhood*. Fathers of this type are similar to traditional

fathers in their attitudes toward masculinity but different from them in showing more affection to their daughters in their relationships. These two types of traditional fatherhood are the most prevalent types in Turkey. Moreover, as an optimal type, involved fathering is characterized by care, control, and affection and is seen in metropolitan cities among egalitarian families.

Collectivistic values of Turkish culture still characterize fatherhood roles in Turkey as being less emotionally but more instrumentally and financially involved (Ataca, 2009). These characterizations seem to affect children's perception of maternal and paternal parenting (Sümer and Kağıtçıbaşı, 2010). Therefore, in this study, we mainly aimed to investigate how perceived paternal parenting behaviors affect children's academic self-efficacy over perceived maternal parenting behaviors. To better understand fathers' unique parenting role in child academic self-efficacy, we systematically compare it with mothers' effect. Fathers' involvement and parenting behaviors are also critical for harmony (consistency) between parents as well as coparenting (Jia and Schoppe-Sullivan, 2011; Fagan and Cabrera, 2012). Thus, we specifically examine the effect of (in)consistency between paternal and maternal parenting on child academic self-efficacy.

Co-parenting

While some couples with children display a full agreement or harmony in child rearing, others may diverge and adopt different styles. The similarities or differences observed between mothers and fathers may stem from certain factors, such as the level of agreement between parents on child-rearing strategies (Feinberg, 2003), traditional gender roles of parents in a given culture (Craig and Mullan, 2011), and marital discord (Margolin et al., 2001) though not limited to these factors only. Co-parenting indicates parents' consistent behaviors, overlapping strategies, and shared responsibilities in child rearing (Feinberg, 2003). It is a central process for child adjustment (Margolin et al., 2001). Thus, parents need to display mutual support and coordinate their behaviors for optimal child outcomes. A past study has shown that besides mothers' and fathers' individual parenting styles (Fan and Chen, 2020), co-parenting is also related to other aspects of family dynamics such as marital conflict (Margolin et al., 2001; Schoppe-Sullivan et al., 2004) and parental divorce (Maccoby et al., 1990; Becher et al., 2019).

Co-parenting is commonly characterized by cooperation, support, sharing of responsibilities, and agreement between parents on child rearing issues (Teubert and Pinquart, 2010). In this study, we extend the definition of co-parenting by adding consistency in parental behaviors. Specifically, we define three types of co-parenting consistency based on four categorizations of paternal and maternal parenting considering its potential impact on child outcomes. The first type is *positive coparenting* in which both mothers and fathers show the most adaptive level of coordination by simultaneously adopting ideal parenting behaviors. For instance, both parents show high levels of emotional warmth or low levels of rejection in this type. As the optimal type, positive co-parenting is assumed to improve child functioning and promote favorable child outcomes. The second one is *negative coparenting* in which both parents simultaneously

adopt dysfunctional parenting behaviors or understate adaptive parenting practices. For instance, both parents show low emotional warmth and high rejection behaviors. The final type is *inconsistent coparenting* in which parents adopt discrepant levels of the same parenting behaviors as one parent is showing high and the other one is showing low levels of the same parenting behavior. These parents may not be motivated to act synchronized or, conversely, overdue the role of the other parental figure within the family.

The quality of these co-parenting behaviors may lead to various outcomes. We can speculate that while positive co-parenting is the most adaptive, negative co-parenting undoubtedly is the most dysfunctional one. Inconsistent co-parenting, however, may fall in between, and its effect may vary depending on which parent, mother or father, has the higher or lower level of the given parenting behavior in a culture-specific context. That is, having one parent who fits well with the developmental needs of children can compensate the other parent's incongruent parenting behavior and protect children from potential negative outcomes. We define the potential effect of this type as the *inconsistency compensation* effect. Depending on the child's gender and specific parenting behavior, we can observe either *mother compensatory* or *father compensatory* effect. Nevertheless, having one parent with less ideal behaviors within a parenting dyad is still a risk factor. Such inconsistent parenting behaviors might lead to identical outcomes with negative coparenting. That is, the presence of one parent's negative behavior could be enough to produce negative outcomes. We call this type of effect the *inconsistency deterioration* effect. Again, depending on the child's gender and specific parenting behavior, we can observe either *mother deterioration* or *father deterioration* effect. Effects of inconsistent co-parenting can be sensitive to cultural contexts. For instance, in a traditionally gendered culture in which mothers play a nurturing role and fathers play a strict disciplining (controlling) role, low maternal warmth or high maternal rejection may lead to more harmful outcomes than low paternal warmth or high paternal rejection.

Indeed, convergent evidence supports these claims. For instance, 2-year-old children who have one supportive parent were more advantaged in their cognitive development than those who have none (Ryan et al., 2006). Co-parenting conflicts negatively predicted preschool children's math and literacy scores (Cabrera et al., 2012), increased the development of adolescents' risky behaviors (Baril et al., 2007), or predicted higher levels of adolescents' antisocial behaviors (Feinberg et al., 2007). Moreover, a previous study has shown a relationship between parental (dis)agreement and (in)consistencies, and children's psychological controlling (Block et al., 1981), ego resiliency (Lamb et al., 1989), moral adjustment, personality development (Vaughn et al., 1988), and psychological disorders (Dwairy, 2008). In their meta-analytic study, Teubert and Pinquart (2010) thoroughly examined the role of co-parenting, particularly coordination and agreement, in child and adolescent internalizing and externalizing problems as well as social functioning. Their findings revealed that co-parenting had stronger effects on longitudinal change in child adjustment

levels. Considering co-parenting influences a large number of developmental outcomes; this study tested its role in one of those, namely, academic self-efficacy.

The Relationship Between Parenting and Academic Self-Efficacy

Academic self-efficacy or academic self-concept is the individuals' knowledge and perceptions about their performance in academic situations (Ferla et al., 2009). We used academic self-efficacy and academic self-concept interchangeably, although others argue differences between these concepts (see Marsh, 1990). Individuals' beliefs and perceptions vary across academic subjects in interaction with gender, such that boys are generally more confident in mathematics, science, or areas related to technology, and girls have either higher levels of self-efficacy in language and literacy than boys or have similar levels of self-efficacy even though girls' actual performance is better (Pajares, 2003; Pajares et al., 2007). As a motivational basis of academic success, academic self-efficacy refers to students' attitudes and mastery beliefs in academic domains and is a strong predictor of subsequent academic achievement (Marsh and Martin, 2011; Marsh and Seaton, 2013). There exists a bidirectional relationship between academic self-concept and achievement (see Marsh and Martin, 2011, for a discussion), suggesting that academic self-efficacy is both dependent on previous performance (Ferla et al., 2009) and helps in increasing the current level of achievement (Marsh and Martin, 2011). The way parents exert power and control on their children or provide feedback and appreciation to them is also critical for academic self-efficacy and school success. A previous study has demonstrated that school-specific parenting behaviors (Catsambis, 2001), parenting control (Masud et al., 2015; Pinquart, 2016), and parental involvement in children's academic engagement (Cheung and Pomerantz, 2011) have a robust effect on children's academic success, and that academic self-efficacy mediates the effect of parenting styles on academic performance (Llorca et al., 2017).

Still, the vast majority of previous studies obtained single parent reports only; thus, there is scarcity in studies examining the separate, combined, and additive effects of fathers and mothers in terms of co-parenting consistency. In a recent study, Suizzo et al. (2017) found a unique effect of fathers' warmth on adolescents' academic development. Indeed, in their study, positive paternal behaviors such as father warmth influenced adolescents' academic performance by increasing positive beliefs such as optimism and academic self-efficacy as well as their level of determination (Suizzo et al., 2017). We propose that, over and beyond mothers' effect, fathers could influence children's academic self-efficacy. In addition to emotional warmth, we included three more parenting behaviors, which are rejection, intrusion, and guilt induction. Specifically, we examined if the predictive power of paternal behaviors on girls' and boys' academic self-efficacy varies in specific dimensions of parenting behaviors. For instance, Pinquart (2016) found that school-specific parenting behaviors had stronger effects than general parenting styles.

As would be expected, authoritative parenting was more effective in increasing children's academic performance than other parenting styles (Masud et al., 2015). In this study, we included both relatively global (or culture free) parenting behaviors, namely, parental emotional warmth and rejection, and culture-specific (i.e., relatively common in Turkish culture) parental psychological control behaviors, namely, guilt induction and intrusion, to systematically investigate the effects of critical parenting behaviors on the domains of academic self-efficacy. Previous studies have also provided some evidence for the interaction between parent and child gender by comparing same-sex parent-child dyads with mixed-dyads (Pinquart, 2016). Although this was beyond our purposes, we performed separate analyses for girls and boys considering that their academic self-efficacy differs across academic domains.

Universal vs. Culture-Common Parenting Behaviors

Parents adopt different child-rearing strategies across cultures (Bornstein, 2012). Some strategies manifest similar positive or negative effects on children regardless of cultural setting, although others' effects are bound to specific cultural contexts. These culturally bound parenting behaviors are considered less desirable in universal terms, although they may be compatible with cultural values and parents' socialization goals in a given cultural context. Thus, certain parenting behaviors become relatively more normative and less harmful in specific cultures. Parental psychological control is a typical example of culture-specific effects. In collectivistic cultures like that in China, parents frequently rely on components of psychological control such as love withdrawal, shaming, or guilt induction as parenting methods (Olsen et al., 2002). Although parental psychological control is generally considered a harmful practice in Western cultures, parents in the East may use the means of psychological control to socialize with their children in line with cultural values (Scharf and Goldner, 2018). For instance, whereas Chinese mothers' academic involvement was accompanied with higher levels of psychological control, American parents' academic involvement was accompanied with higher levels of autonomy support, and still, parental involvement predicted children's increased level of academic engagement and achievement in both cultures (Cheung and Pomerantz, 2011). That is, intrusive parenting strategies are relatively common and not perceived as harmful in mainly collectivistic cultures.

Parents in Turkish culture with their closely knit family structure and collectivistic values have traditional child socialization goals and parenting practices, which are mainly characterized by parental control (Kağıtçıbaşı, 2007). For instance, it is a relatively common practice to adopt certain psychological controlling behaviors such as guilt induction, using guilt as a means of pressuring children to comply with parental demands (Barber and Harmon, 2002), or intrusion. However, these practices are not necessarily perceived as negative and may even be perceived as a sign of involvement and care, as

well as a way of transmitting expectations. Similarly, Rudy and Halgunseth (2005) showed that guilt induction is common in collectivist cultures and is not related to maladaptive parental cognitions. Sümer and Kağıtçıbaşı (2010) identified three dimensions of psychological control, namely guilt induction, love withdrawal, and overprotection, as culturally relevant or culture-common behaviors in Turkey and examined their effects with parental warmth and rejection on attachment to parents during middle childhood. Results showed that although parental warmth and rejection, representing universal patterns, strongly predicted attachment to parents, the three subdimensions of psychological control either had no effects or had weak negative effects on attachment to parents. These findings suggest that certain aspects of parental psychological control such as mild intrusion might be perceived as normative in Turkish culture. However, we need to be cautious in these arguments, since effects of culture-common parenting behaviors vary, and contradictory findings exist (e.g., Bean et al., 2003; Kindap et al., 2008).

This Study

The aim of this study was twofold. First, we examined the unique role of fathers' parenting behaviors in girls' and boys' academic self-efficacy in math and literature courses. We specifically focused on common (i.e., parental intrusion and guilt induction) and universal (i.e., emotional warmth and rejection) parenting behaviors. Overall, we expected that parental warmth positively predicts but rejection, intrusion, and guilt induction negatively predict literature and math self-efficacy. The effect of paternal parenting behaviors remains significant over and beyond the effect of matched maternal parenting behaviors. Second, we investigated the effect of co-parenting quality on girls' and boys' levels of academic self-efficacy. Academic self-efficacy was expected to differ according to the quality of perceived co-parenting behaviors. We specifically proposed that positive co-parenting behaviors are related to highest levels of academic self-efficacy, and that negative co-parenting behaviors are related to lowest levels of academic self-efficacy in both literature and math courses. Effects of inconsistent co-parenting behaviors were expected to fall in between these two ends. On the one hand, this effect would be similar to positive co-parenting if an inconsistency compensatory effect exists. Considering gender-based parenting roles (i.e., nurturing mothers and controlling fathers) in Turkish culture, we expected that compensatory effects would particularly be seen for culture-common parenting dimensions. On the other hand, it would be similar to negative co-parenting if an inconsistency deterioration effect exists. We expected that deterioration effects would be more likely for universal parenting dimensions given that they refer to the value of the child in the family (i.e., parental warmth has positive and rejection has negative effects regardless of cultural variation and parent's gender). Finally, although we did not have specific hypotheses or test the interaction effect between parent's or child's gender and outcome variables, we still expected to observe a joint effect. That is, there would be

father compensatory or deterioration effects on boys' math self-efficacy and mother compensatory or deterioration effects on girls' literature self-efficacy.

MATERIALS AND METHODS

Participants

This study was part of a larger community-based study conducted by Sümer et al. (2009). Data were collected from 4th- and 5th-grade children across 16 schools from different cities in Turkey (i.e., Ankara, Samsun, Mersin, and Manisa). All the 4th- and 5th-grade children from selected schools were targeted as sample. Children whose parents agreed on their participation and signed the consent form participated to the study. Overall, there were 1,931 children in the final sample ($M_{age} = 10.37$ years, $SD = 0.88$). Gender and age distribution of the participants ($N_{girls} = 978$, $M_{age} = 10.36$ years, $SD = 0.9$; $N_{boys} = 953$, $M_{age} = 10.38$ years, $SD = 0.87$) were almost equal. The children rated parenting behaviors of their mothers ($M_{age} = 36.48$, $SD = 5.11$) and their fathers ($M_{age} = 40.83$, $SD = 5.79$). Majority of the mothers were primary school (29.7%) or high school graduates (30.8%), followed by university (19.9%) and middle school (13.6%) levels. A small percentage of mothers (2.6%) did not have any formal education. Regarding fathers, majority of them were high school (30.2%) or university graduates (30.5%), followed by primary (18%) and middle school (15.3%) levels. A small percentage of the fathers (0.8%) did not have any formal education. Besides, 3.4% of mother education data and 5.2% of father education data were missing.

Measures

Parenting behaviors were measured through a collection of parenting scales used in Sümer et al. (2009) study. The scales and items explained below were adapted from different measures or composed by the researchers (Barber, 1996; Arrindell et al., 1999; Olsen et al., 2002; Sümer et al., 2009). These measures aimed to assess children's perceptions about their mothers' and fathers' parenting behaviors on the emotional warmth, rejection, intrusion, and guilt induction dimensions. Children completed the same measures for their mothers and fathers separately on a 4-point Likert scale (1 = no, 2 = sometimes, 3 = most of the time, and 4 = always).

The emotional warmth and rejection dimensions represent universal parenting behaviors, whereas intrusion and guilt induction represent critical dimensions of parental psychological control that are not uncommon in the Turkish cultural context. Therefore, these two dimensions are briefly labeled as culture-common parenting behaviors (see Sümer and Kağıtçıbaşı, 2010). This study adopted a predefined factor structure performed by Sümer et al. (2009) supporting the psychometric quality of the measures.

The universal dimension of parenting, emotional warmth, and rejection subscales was measured using Arrindell et al. (1999) corresponding subscales in the EMBU. The warmth subscale (8 items, $\alpha = 0.8$ and $\alpha = 0.81$ for mothers and fathers, respectively) measures positive parenting behaviors such as unconditional

love, special care, or being interested in children's needs and desires (e.g., *Does your mother/father try to comfort you when something bad happened?*). The rejection subscale (11 items, $\alpha = 0.84$ and $\alpha = 0.88$, for mothers and fathers, respectively) measures parents' insensitivity to their children's needs and desires as well as the level of perceived punishment or conflict (e.g., *Does your mother/father get tough on you?*). Subscales for intrusion and guilt induction were developed by Sümer et al. (2009) considering related parenting behaviors that are common in Turkish culture. The eight-item intrusion subscales ($\alpha = 0.69$ and $\alpha = 0.71$ for mothers and fathers, respectively) assess how much parents interfere with their children's autonomy with intrusive behaviors (e.g., *Does your mother/father move your stuff in your room without asking?*). The guilt induction subscale (5 items, $\alpha = 0.45$ and $\alpha = 0.46$ for mothers and fathers, respectively) measures parents' intention to make their children feel guilty about their undesirable behaviors (e.g., *Do you feel that you have disappointed your mother/father?*). Reliability coefficients for the guilt induction subscale were relatively low, since they consist of a few items assessing different aspects of guilt-inducing parenting behaviors.

Academic self-efficacy was measured via Turkish translation (Özdemir, 2002) of the Academic Self-Description Questionnaire (ASDQ) developed by Marsh (1990). This is a self-rating instrument composed of two dimensions, literature self-efficacy and math self-efficacy, and 6 items for each dimension (e.g., *When I compare myself with my peers, I am good at Literature/Math.*). Children rated themselves on these items with a 4-point scale (1 = completely false, 2 = false, 3 = true, 4 = completely true). Internal consistency coefficients for literature ($\alpha = 0.83$ and $\alpha = 0.82$ for girls and boys, respectively) and math subscale ($\alpha = 0.85$ and $\alpha = 0.84$, for girls and boys, respectively) were high in this study.

Procedure

A set of questionnaires was given to children after obtaining a consent form from their parents. They responded to the parenting behavior scale separately for their mothers and fathers. They also evaluated their academic self-efficacy in literature (Turkish) and math courses. All procedures and materials were approved by Middle East Technical University, Human Research Ethics Committee.

RESULTS

Statistical Method

All statistical analyses were conducted using IBM SPSS Statistics 26 (IBM Corp, 2019; Armonk, NY, United States). We first performed descriptive statistics with *t*-tests and correlation analysis. We then performed a hierarchical regression analysis to test the predictive power of paternal parenting behaviors over and beyond the effect of maternal parenting behaviors. Lastly, we performed a series of ANOVA to test the role of co-parenting quality in children's literature self-efficacy (LSE) and math self-efficacy (MSE).

Descriptive Statistics

Gender Differences in Study Variables

We first examined potential gender differences on the study variables via a series of one-way ANOVAs. As seen in **Table 1**, the girls reported higher levels of LSE than the boys [$F(1,1,911) = 74.22, p < 0.001$], whereas the boys reported higher levels of MSE than the girls [$F(1,1,911) = 15.18, p < 0.001$]. In addition, the girls perceived higher levels of positive parenting behaviors from both fathers and mothers. That is, the girls reported higher levels of paternal warmth [$F(1,1,906) = 4.47, p < 0.05$] and maternal warmth from their parents than the boys [$F(1,1,924) = 16.6, p < 0.001$]. However, this pattern was reversed for negative parenting dimensions. That is, the boys reported higher levels of paternal rejection [$F(1,1,905) = 29.92, p < 0.001$] and maternal rejection than the girls [$F(1,1,924) = 13.32, p < 0.001$]. Also, the boys reported higher levels of paternal intrusion [$F(1,1,905) = 47.79, p < 0.001$] and maternal intrusion than the girls [$F(1,1,923) = 34.75, p < 0.001$]. Perceived paternal guilt induction was higher for the boys than for the girls [$F(1,1,905) = 15.16, p < 0.001$]; however, perceived maternal guilt induction was marginally different [$F(1,1,924) = 3.83, p = 0.051$].

Bivariate Correlations

Correlations among study variables are presented in **Table 1**. All perceived parenting variables, except guilt induction, were significantly associated with LSE and MSE for both girls and boys. Both universal parenting dimensions (warmth and rejection) were strongly correlated with girls' and boys' academic self-concept (LSE and MSE). That is, LSE and MSE were positively correlated to warmth and negatively correlated to rejection. However, culture-common parenting behaviors (guilt induction and intrusion) were weakly correlated with the same outcome variables. Both girls' and boys' LSE and MSE were negatively correlated with intrusion, whereas the boys' LSE was positively correlated with guilt induction.

Testing the Predictive Power of Paternal Parenting Variables

We performed four sets of hierarchical regression analyses to test the predictive power of paternal parenting on girls' and boys' literature and math self-efficacy over and above maternal parenting variables. As presented in **Table 2**, we first tested the effect of maternal and paternal parenting behaviors on girls' LSE levels. The models were significant in the first step [$F(4,952) = 22.2, p < 0.001, R^2 = 0.085$] and in the second step [$F(8,948) = 22.28, p < 0.001, R^2 = 0.094$]. Results revealed that mother warmth positively and rejection negatively predicted girls' LSE in the first step. Mother warmth remained significant in the second step [$B = 0.21, t(948) = 4.88, p < 0.001$]. There were no other significant effects.

Regression analysis on boys' level of LSE was significant in the first step [$F(4,928) = 32.04, p < 0.001, R^2 = 0.121$] and in the second step [$F(8,924) = 21.77, p < 0.001, R^2 = 0.159$]. Mother warmth significantly and positively predicted the boys' LSE both in the first step and in the second step [$B = 0.19, t(924) = 4.33, p < 0.001$]. Father warmth also significantly and

TABLE 1 | Intercorrelations between the study variables and means and standard deviations (SD).

	1	2	3	4	5	6	7	8	9	10
(1) LSE	1	0.46**	−0.18**	−0.15**	0.28**	0.24**	−0.10**	−0.10**	0.02	0.03
(2) MSE	0.39**	1	−0.25**	−0.21**	0.26**	0.29**	−0.22**	−0.15**	−0.00	0.06
(3) Mother Rejection	−0.18**	−0.17**	1	0.49**	−0.39**	−0.30**	0.62**	0.37**	0.18**	0.16**
(4) Father rejection	−0.17**	−0.17**	0.53**	1	−0.22**	−0.44**	0.36**	0.67**	0.14**	0.11**
(5) Mother warmth	0.34**	0.20**	−0.40**	−0.23**	1	0.60**	−0.25**	−0.11**	0.26**	0.18**
(6) Father warmth	0.37**	0.25**	−0.30**	−0.42**	0.64**	1	−0.23**	−0.28**	0.11**	0.26**
(7) Mother intrusion	−0.09**	−0.16**	0.62**	0.42**	−0.22**	−0.18**	1	0.50**	0.21**	0.17**
(8) Father intrusion	−0.13**	−0.14**	0.41**	0.68**	−0.13**	−0.27**	0.57**	1	0.18**	0.17**
(9) Mother guilt	0.08*	0.02	0.14**	0.13**	0.31**	0.18**	0.24**	0.18**	1	0.64**
(10) Father guilt	0.11**	0.03	0.15**	0.21**	0.23**	0.25**	0.24**	0.27**	0.62**	1
Means (SD) for girls	3.40 (0.49)	3.09 (0.57)	1.18 (0.29)	1.16 (0.32)	3.48 (0.52)	3.35 (0.60)	1.41 (0.38)	1.29 (0.36)	2.31 (0.59)	2.23 (0.58)
Means (SD) for boys	3.20 (0.53)	3.19 (0.55)	1.24 (0.36)	1.25 (0.38)	3.38 (0.55)	3.29 (0.60)	1.52 (0.46)	1.42 (0.43)	2.36 (0.59)	2.33 (0.60)

Upper diagonal represents correlation coefficients for girls and lower diagonal represents correlation coefficients for boys.

* $p < 0.05$, ** $p < 0.01$.

TABLE 2 | Maternal and paternal parenting behaviors predicting girls' and boys' literature and math self-efficacy.

	Literature self-efficacy				Math self-efficacy			
	Girls		Boys		Girls		Boys	
	Beta (SE)	B (Bootstrapped 95% CI)	Beta (SE)	B (Bootstrapped 95% CI)	Beta (SE)	B (Bootstrapped 95% CI)	Beta (SE)	B (Bootstrapped 95% CI)
Step 1								
Mother warmth	0.24 (0.03)	0.26** (0.19 – 0.32)	0.32 (0.04)	0.33** (0.26 – 0.40)	0.21 (0.04)	0.19** (0.12 – 0.28)	0.17 (0.04)	0.17** (0.09 – 0.24)
Mother rejection	−0.15 (0.07)	−0.09* (−0.19 – [−0.00])	−0.06 (0.06)	−0.04 (−0.13 – 0.05)	−0.20 (0.08)	−0.10* (−0.22 – [−0.03])	−0.07 (0.07)	−0.05 (−0.13 – 0.05)
Mother intrusion	0.04 (0.05)	0.03 (−0.05 – 0.11)	0.00 (0.05)	0.00 (−0.08 – 0.09)	−0.15 (0.06)	−0.10* (−0.21 – [−0.02])	−0.11 (0.05)	−0.09* (−0.17 – [−0.01])
Mother guilt induction	−0.03 (0.03)	−0.04 (−0.10 – 0.02)	−0.01 (0.03)	−0.01 (−0.08 – 0.06)	−0.01 (0.03)	−0.01 (−0.09 – 0.06)	0.00 (0.03)	0.00 (−0.07 – 0.07)
Step 2								
Mother warmth	0.20 (0.04)	0.21** (0.12 – 0.30)	0.18 (0.04)	0.19** (0.19 – 0.28)	0.11 (0.05)	0.10* (0.01 – 0.20)	0.06 (0.05)	0.06 (−0.03 – 0.15)
Mother rejection	−0.12 (0.08)	−0.07 (−0.18 – 0.02)	−0.05 (0.07)	−0.04 (−0.13 – 0.05)	−0.16 (0.09)	−0.08† (−0.19 – 0.01)	−0.05 (0.07)	−0.03 (−0.12 – 0.06)
Mother intrusion	0.07 (0.06)	0.05 (−0.03 – 0.14)	0.03 (0.05)	0.03 (−0.06 – 0.12)	−0.15 (0.06)	−0.10* (−0.21 – [−0.00])	−0.09 (0.06)	−0.08† (−0.16 – 0.02)
Mother guilt induction	−0.03 (0.04)	−0.03 (−0.11 – 0.05)	−0.03 (0.04)	−0.04 (−0.13 – 0.05)	−0.05 (0.04)	−0.05 (−0.14 – 0.05)	0.00 (0.04)	0.00 (−0.09 – 0.09)
Father warmth	−0.07 (0.04)	0.08† (−0.00 – 0.17)	0.19 (0.04)	0.22** (0.13 – 0.31)	0.14 (0.04)	0.15** (0.06 – 0.18)	0.16 (0.04)	0.18** (0.08 – 0.26)
Father rejection	−0.04 (0.07)	−0.03 (−0.13 – 0.07)	0.00 (0.07)	0.00 (−0.09 – 0.09)	−0.13 (0.08)	−0.07 (−0.20 – 0.03)	−0.03 (0.07)	−0.02 (−0.10 – 0.07)
Father intrusion	−0.04 (0.06)	−0.03 (−0.14 – 0.07)	−0.06 (0.06)	−0.05 (−0.15 – 0.05)	0.05 (0.07)	0.03 (−0.08 – 0.14)	−0.02 (0.06)	−0.02 (−0.11 – 0.07)
Father guilt induction	0.01 (0.04)	0.01 (−0.08 – 0.09)	0.04 (0.04)	0.05 (−0.04 – 0.13)	0.07 (0.04)	0.07 (−0.03 – 0.15)	0.00 (0.04)	0.00 (−0.08 – 0.09)

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

positively predicted the boys' LSE levels [$B = 0.22$, $t(924) = 4.97$, $p < 0.001$]. These results suggested a significant additive effect of father warmth over and beyond the effect of mother warmth.

We tested the role of perceived maternal and paternal parenting variables in girls' MSE levels in the third model

analysis. The models were significant in the first step [$F(4,952) = 25.68$, $p < 0.001$, $R^2 = 0.097$] and in the second step [$F(8,948) = 16.83$, $p < 0.001$, $R^2 = 0.124$]. Results revealed significant positive effects of mother warmth and negative effects of mother rejection and mother intrusion in the first step.

The mother warmth [$B = 0.1$, $t(948) = 2.32$, $p < 0.05$] and mother intrusion [$B = -0.1$, $t(948) = -2.31$, $p < 0.05$] variables remained statistically significant in the second step. Also, father warmth significantly and positively predicted girls' MSE levels [$B = 0.15$, $t(948) = 3.37$, $p < 0.001$].

The final regression analysis on boys' MSE levels yielded significant models in the first step [$F(4,928) = 14.08$, $p < 0.001$, $R^2 = 0.057$] and in the second step [$F(8,924) = 9.92$, $p < 0.001$, $R^2 = 0.079$]. Mother warmth had a positive significant effect and mother intrusion had a negative significant effect on boys' MSE levels in the first step. However, these effects were not significant in the second step. Father warmth significantly and positively predicted boys' MSE levels [$B = 0.18$, $t(924) = 3.82$, $p < 0.001$]. There were no other significant effects. Paternal emotional warmth was the most critical predictor of boys' math efficacy.

Overall, the findings suggested that all the four models were significant both in the first and second steps, indicating the additive effects of paternal parenting behaviors above and over maternal parenting to be in line with our expectations. However, only perceived father warmth and mother warmth were the most consistent predictors of both for girls' and boys' LSE and MSE in the Turkish context. As expected, mother warmth had positive and stronger effects on predicting girls' LSE and MSE, and boys' LSE. Father warmth had positive and stronger effects on boys' LSE, and girls' and boys' MSE.

Testing the Role of Co-parenting Quality

We specifically tested the effects of co-parenting quality by creating all possible combinations of co-parenting (in)consistencies. For this purpose, we first created four categories of co-parenting: (a) *positive co-parenting* describes when both mothers and fathers were simultaneously above the mean scores of positive parenting behaviors (i.e., warmth) and below the mean scores of negative parenting behaviors (i.e., rejection, intrusion, and guilt induction). On the other hand, (b) *negative co-parenting* describes when both mothers and fathers were simultaneously above the mean scores of negative parenting behaviors and below the mean scores of positive parenting behaviors. Finally, (c) *inconsistent co-parenting* (it could also be called asymmetric or lack of co-parenting) describes when one of the parents fell above the mean scores while the other one was below. Two types of inconsistent coparenting were created. One refers to the condition in which the given maternal behaviors were above and the paternal behavior was below the mean scores, and the other refers to the opposite pattern. Thus, children were divided into four groups using mean splits for the given perceived paternal and maternal parenting behavior.

Descriptive analyses showed that the majority of children had positive co-parenting ranging from 725 to 1,083 across parenting behaviors. The number of children under negative co-parenting conditions was relatively low, ranging from 383 to 649. The number of children in group 3 (mother above, father below the mean) under inconsistent co-parenting conditions ranged from 195 to 307. Last, the number of children in group 4 (mother below, father above the mean) under inconsistent co-parenting conditions ranged from 221 to 241. The number of children under positive co-parenting conditions was always highest in all

parenting behaviors. This was followed by negative co-parenting conditions, similarly for all parenting behaviors. With minor differences, the number of children in group 3 was higher in warmth, intrusion, and guilt induction behaviors compared to that in group 4.

To interpret the findings based on the classification given above, we specifically defined the compensation and deterioration effects for positive and negative parenting behaviors as follows: the compensation effect for warmth was observed when inconsistent parenting (i.e., one of the parents had a higher and the other had a lower level of warmth) was not significantly different from positive co-parenting (i.e., both parents have higher levels of warmth). Conversely, the deterioration effect for warmth was observed when inconsistent parenting yielded significantly lower levels of academic self-efficacy than positive co-parenting. This pattern is reversed for negative parenting behaviors (i.e., rejection, intrusion, and guilt induction). Specifically, the compensation effect was observed when children's level of academic self-efficacy in the inconsistent co-parenting groups was not significantly different from that in the positive co-parenting groups (i.e., both parents have lower levels of negative behaviors). Lastly, the deterioration effect for negative parenting behaviors was observed when the levels of outcome variables in the inconsistent co-parenting groups were significantly lower than those in the positive co-parenting groups. Thus, we set the positive co-parenting group as the reference group in determining the compensation and deterioration effects.

We performed univariate ANOVAs on the groups (1, 2, 3, and 4) on LSE and MSE separately for girls and boys on all parenting behaviors. We conducted a *post hoc* analysis with Tukey test if the effect was significant. As presented in **Table 3**, for the effect of warmth on LSE, results revealed a significant main effect of co-parenting quality on the girls' and boys' LSE. Children in group 1 (positive co-parenting) had the highest and those in group 2 (negative coparenting) had the lowest levels of LSE. Girls in group 3 (inconsistent co-parenting [mother above, father below the mean]) had higher levels of LSE, which was similar to positive co-parenting and different from negative co-parenting, indicating a mother compensatory effect for girls. Boys in group 3 (inconsistent co-parenting [mother above, father below the mean]), however, had a lower level of LSE than those in group 1 (positive co-parenting), indicating a father deterioration effect.

For the effect of warmth on MSE, there were significant group differences both for girls and boys. Girls and boys in group 1 (positive co-parenting) reported the highest, and in group 2 (negative co-parenting) reported the lowest levels of MSE. Girls in group 3 and group 4 (inconsistent co-parenting) reported a lower level of warmth than those in the positive co-parenting group, suggesting an inconsistency deterioration effect for both mothers and fathers. Boys in group 3 (inconsistent co-parenting [mother above, father below the mean]) reported a lower level of warmth than those in the positive co-parenting group, suggesting a father deterioration effect.

For the effect of rejection on LSE, results again revealed a significant main effect of co-parenting quality. The level of LSE was highest in group 2 (positive co-parenting) and lowest in

TABLE 3 | Literature and math self-efficacy scores of girls and boys across the four groups of co-parenting (in)consistency.

Literature self-efficacy								
Girls (N = 957)								
Sub-groups	1	2	3	4	MS	F	η_p^2	Effect type
Warmth	3.51 _a	3.21 _b	3.40 _{ac}	3.34 _{bc}	5.34	23.75**	0.07	Mother compensation
Rejection	3.24 _a	3.46 _b	3.30 _{ac}	3.40 _{bc}	2.44	10.43**	0.03	Mother compensation
Intrusion	3.30 _a	3.44 _b	3.38 _{ab}	3.40 _{ab}	0.89	3.73*	0.01	No effect
Guilt induction	3.42	3.41	3.34	3.34	0.35	1.44	0	No effect
Boys (N = 933)								
Warmth	3.38 _a	2.99 _b	3.10 _{bc}	3.18 _c	9.3	37.92**	0.11	Father deterioration
Rejection	3.03 _a	3.30 _b	3.09 _a	3.15 _a	4.29	16.41**	0.05	Inconsistency deterioration
Intrusion	3.14	3.24	3.19	3.15	0.66	2.43	0.01	No effect
Guilt induction	3.27 _a	3.16 _b	3.14 _{ab}	3.19 _{ab}	0.89	3.28*	0.01	No effect
Math self-efficacy								
Girls (N = 957)								
Warmth	3.23 _a	2.89 _b	3.02 _b	3.05 _b	6.89	22.86**	0.07	Inconsistency deterioration
Rejection	2.88 _a	3.19 _b	2.99 _a	3.02 _a	5.05	16.42**	0.05	Inconsistency deterioration
Intrusion	2.95 _a	3.18 _b	3.01 _a	3.06 _{ab}	2.96	9.42**	0.03	Mother deterioration
Guilt induction	3.13	3.09	3.02	3.1	0.49	1.52	0.01	No effect
Boys (N = 933)								
Warmth	3.30 _a	3.05 _b	3.13 _b	3.19 _{ab}	3.78	12.91**	0.04	Father deterioration
Rejection	2.97 _a	3.28 _b	3.22 _b	3.16 _b	4.77	16.48**	0.05	Inconsistency compensation
Intrusion	3.08 _a	3.27 _b	3.12 _a	3.16 _{ab}	2.13	7.16**	0.02	Mother deterioration
Guilt Induction	3.22	3.19	3.13	3.18	0.31	1.03	0	No effect

* $p < 0.01$, ** $p < 0.001$.

Children were categorized into four groups using mean splits on the basis of the given maternal and paternal parenting behavior. Group 1 represents both mother and father ratings are above their group means; group 2 represents both mother and father ratings are below the group means; group 3 represents mother rating is above and father rating is below the group mean; and group 4 represents mother rating is below the group mean and father rating is above the group mean. Post hoc differences among the groups were calculated using Tukey's honestly significant difference (HSD). Means not sharing subscripts differ significantly at the level of $\alpha = 0.05$, as indicated by Tukey's HSD (see section "Testing the Role of Co-parenting Quality" for detailed descriptions of the subgroups).

group 1 (negative co-parenting) among both boys and girls. There was no significant difference between group 4 (inconsistent co-parenting [mother below, father above the mean]) and group 2 on girls' LSE, suggesting a mother compensation effect. However, boys in negative and inconsistent co-parenting groups reported lower levels of LSE than those in positive parenting group, suggesting an inconsistency deterioration effect for both mothers and fathers.

For the effect of rejection on MSE, girls and boys in group 2 (positive co-parenting) reported highest levels of MSE. There was no significant difference between the negative and inconsistent coparenting groups on girls' MSE. However, there was a significant difference between the inconsistent and positive co-parenting groups in boys' MSE. These results suggested an inconsistency deterioration effect for the girls and an inconsistency compensatory effect for the boys.

Regarding the effect of intrusion on LSE, there was no significant group differences for boys. Girls in group 2 (positive co-parenting), however, had the highest, whereas girls in group 1 (negative co-parenting) had the lowest levels of LSE. No compensation or deterioration effect was observed.

For the effect of intrusion on MSE, results were significant for both girls and boys. Again, girls and boys in group 2 (positive co-parenting) had highest levels of MSE. *Post hoc* results showed that girls and boys in group 3 (inconsistent co-parenting [mother above, father below the mean]) reported a lower level of intrusion than those in group 2 (positive co-parenting), suggesting a mother deterioration effect for both girls and boys.

For the effect of guilt induction, results revealed significant differences between co-parenting groups only for boys' LSE levels. No effect was found for girls' LSE and girls' and boys' MSE. Boys in group 1 (negative co-parenting) had higher levels of LSE than those in group 2 (positive co-parenting). These results suggested that guilt induction (although it was conceptually negative parenting) had a positive effect on boys' LSE. No compensation or deterioration effect was observed.

Overall, as expected, children with positive co-parenting had the highest, and those with negative co-parenting had the lowest levels of academic self-efficacy with one exception. Contrary to our expectation, boys reporting higher levels of guilt induction also had a high level of LSE. Inconsistent co-parenting yielded compensatory or deterioration effects.

Moreover, parental warmth had moderately strong effect sizes, with η_p^2 values ranging from 0.04 to 0.11. As subdimensions of culture-common parenting behaviors, intrusion and guilt induction yielded weak effect sizes, with η_p^2 values ranging from 0.01 to 0.03.

DISCUSSION

This study investigated the unique contribution of fathers' perceived parenting behaviors over mothers' behaviors and the quality of co-parenting in primary school children's academic self-efficacy. As expected, both girls' and boys' literature and math self-efficacy increased as a function of high levels of positive parenting behaviors and low levels of negative parenting behaviors. Importantly, the number of father and mother variables that remained significant in the regression models were close. This shows that fathers' parenting was as effective as mothers' parenting. In addition, a series of ANOVAs testing the effects of coparenting consistency showed that children with positively consistent parents reported the highest levels of academic self-efficacy, and that those with negatively consistent parents reported the lowest level of academic self-efficacy. Combinations of inconsistent co-parenting, however, revealed mother and father compensatory and deterioration effects depending on the parent's and child's gender, domain of parenting behavior, and academic efficacy. Overall, parental warmth was the strongest predictor in regression analysis. As we expected, the effects were weak or non-significant for the culture-common psychological control variables, intrusion, and guilt induction. These observations are discussed as a function of child's and parent's gender, parenting behaviors, and outcome variables.

We specifically focused on children's perceptions of universal and culture-common parenting behaviors in predicting academic self-efficacy. As seen in **Table 1**, on a four-point scale, mean scores of the parental emotional warmth are highest, whereas parental rejection is lowest for both fathers and mothers. This shows that parents in Turkish culture are likely to adopt functional levels of universal parenting behaviors. Regarding culture-common parenting practices reflecting the specific dimensions of parental psychological control, the mean of perceived guilt induction was relatively higher than the mean of intrusion. This suggests that Turkish parents may see guilt induction as a way of securing emotional interdependence or constant relatedness of their children (Kağıtçıbaşı, 2007; Sümer and Kağıtçıbaşı, 2010). Consistently, children may perceive their parents' guilt induction behavior as an indicator of parental emotional warmth and involvement in the given cultural context. Interestingly, children did not perceive high levels of intrusion from their parents. This might again imply that children perceived their parents' use of intrusion as normative given the collectivistic values of Turkish culture. Alternatively, the parents in this sample did not adopt high levels of psychological control but showed a trend for more adaptive parenting strategies.

Another important finding on the mean level analyses was gender difference between girls and boys in academic self-efficacy and perceived parenting behaviors. In line with the

literature, the girls had higher literature self-efficacy, and the boys had higher math self-efficacy (Marsh and Craven, 2006). The difference between the girls and the boys was stronger in literature self-efficacy, which demonstrates that the girls are more confident in their literacy skills. In addition, the boys seemingly reported higher levels of perceived negative parenting behaviors (i.e., rejection, intrusion, and guilt induction), which can be interpreted as boys' greater demand for autonomy than girls, yet the girls tended to report higher levels of warmth than the boys.

We tested our expectations on the unique contribution of fathers' parenting behaviors over and above mothers' parenting behaviors by examining the number of significant effects that remained in the models and comparing the *standardized beta* values. Results revealed that four significant mother effects and three significant father effects remained significant in the second step of hierarchical regression models. Although the numbers were similar, it does not equate to the roles of fathers and mothers. To begin with, we found a consistent positive effect of parental warmth on children's academic self-efficacy. Although mother warmth revealed a clear and strong effect on literature self-efficacy both for girls and boys, it was different in math self-efficacy. That is, there was only a significant effect of mother warmth on girls' math self-efficacy. Father warmth, however, yielded significant effects on math self-efficacy both for boys and girls. Moreover, father warmth significantly or marginally significantly remained in the other models even after controlling for the mother effects. These positive effects showed that both mother warmth and father warmth are critical and needed for positive child outcomes (Pinquart, 2016). However, mother warmth seemed to be more important for girls and literature self-efficacy, and father warmth seemed to be more important for boys and math self-efficacy in the Turkish cultural context.

Regarding parental rejection, we expected that this universally negative parenting dimension would decrease children's academic self-efficacy. Maternal rejection seemed to deteriorate child outcomes, especially for girls. However, these effects were not significant in the second step of the models, except that maternal rejection had a marginally significant effect on girls' math self-efficacy. Overall, comparison of the father and mother effects in the universal parenting dimensions demonstrated that the mothers had a greater number of significant effects, but that fathers' effects were relatively larger in the size of beta values, although these betas were not statistically compared. Our findings were in line with past studies showing the importance of fathers as well as mothers (Kim and Rohner, 2002). We can argue that fathers and mothers might function differently (Chen et al., 2000; Lv et al., 2018) and make their contributions in their unique ways (Jeynes, 2016).

The power of culture-common parenting behaviors in predicting children's academic self-efficacy was weak. Maternal intrusion only negatively predicted girls' MSE. There were no other significant effects of intrusion and guilt induction. This suggests that similar to the findings in other collectivistic cultures, such as that in China (e.g., Chen et al., 1998), these aspects of psychological control might be perceived as normative; hence,

it has fewer negative effects on child functioning in Turkish culture. Consistent with previous findings showing significant relationships between general parenting practices and styles and children's academic concept or achievement (Suizzo et al., 2017), we found that the universally positive parenting behavior, namely warmth, had the strongest effect. It should be noted that parenting behaviors specific to academic domains such as parents' educational involvement (Catsambis, 2001) and academic aspirations (Lv et al., 2018) explain more variance in academic efficacy than general parenting behaviors. Besides, this lack of significant findings draws attention to cultural interplays of psychological control. That is, culturally common and relevant parental psychological control behaviors were not perceived as negative in Turkish culture. Consistently, a previous study has shown that parental psychological control and attachment insecurity are not associated in the Turkish cultural context (Güngör and Bornstein, 2010; Sümer and Kağıtçıbaşı, 2010). This study expanded this effect to the domain of academic self-efficacy.

Beyond the unique role of fathers in child development, how well fathers cooperate with mothers is a critical factor. This study extended the definition of co-parenting to the consistency between parenting behaviors. In line with this, three types of co-parenting were specified, namely, positive coparenting, negative coparenting, and inconsistent coparenting. Our expectations on positive co-parenting overlap with those of a previous study (e.g., Teubert and Pinquart, 2010). Positive co-parenting represents the optimal level of agreement, consistency, and similarity in child-rearing strategies; hence, it is the most functional co-parenting type among all. Our study has shown that children who are raised in a positive co-parenting climate have the highest level of literature and math self-efficacy. Conversely, negative co-parenting behaviors led to the lowest levels of academic self-efficacy, implying that above the unique effects of maternal and paternal parenting, the quality of co-parenting seems to have an additional advantage, which should be inquired about more in further studies.

The only exception that was inconsistent with the effects of positive and negative co-parenting types was the effect of guilt induction on boys' literature self-efficacy. Specifically, boys who perceived higher levels of guilt induction from both parents had the highest level of literature self-efficacy, although effect size was minimal. We can speculate that children's perceptions of parenting behaviors are much more important than actual parenting. When children interpret high levels of parenting psychological control as an indication of parental love and care, the negative effects of these behaviors may lessen (Scharf and Goldner, 2018). This is not conclusive for this study, since we did not measure children's perceptions of normativeness of these parental behaviors. Furthermore, the adverse effects of parental controlling behaviors may decrease as a function of socialization goals in collectivistic cultures. Parents may benefit from the means of psychological control, such as guilt induction, as a teaching strategy, imposing cultural values, or raising empathy in their children toward themselves and others (Scharf and Goldner, 2018). Therefore, perceptions of higher levels of guilt induction from both parents may create an opportunity for increased levels of self-efficacy. Our findings are in line with

cultural interpretations of parenting behaviors; however, more research is needed.

Although we did not statistically perform any interaction analysis, we can speculate on joint effects of variables looking at the number of significant effects. In line with previous studies (e.g., Ryan et al., 2006; Baril et al., 2007; Feinberg et al., 2007; Cabrera et al., 2012), inconsistent co-parenting revealed compensation or deterioration effects depending on parent and child gender, domain of parenting behavior, and academic efficacy. Inconsistent co-parenting was compensatory for children only to some degree. As seen in **Table 3**, out of 10 significant effects of inconsistent co-parenting, three are compensatory effects. However, one can argue that some of these compensation effects can also be seen as deterioration depending on interpretation. For instance, for the effect of warmth on girls' LSE, we observed a mother compensation effect, since reporting higher levels of mother warmth yielded higher levels of LSE, which indicated a mother compensation effect. On the contrary, reporting lower levels of mother warmth yielded lower levels of LSE, which indicates a mother deterioration effect, which indeed confirms the mother's critical role. A similar interpretation can also be made for the effect of rejection on girls' LSE. We call for careful interpretation of this situation but still suggest that having one parent may be good enough to protect a child's academic self-efficacy from potential detriments of the other careless parent. Consistent with the previous findings, having at least a supportive mother or father benefits children's cognitive development over having negative coparenting (Ryan et al., 2006).

The inconsistency compensatory effects showed a high level of match between the gender of parents and that of the children. There were two significant mother compensatory effects, and these were for the girls. There was one significant inconsistency compensatory effect, and this one was for the boys. This suggests that having one parent with optimal level of parenting behavior was enough for boys to create a compensatory effect regardless of the gender of the parent. These numbers point to a tendency for same-sex parent-child compensatory effects, particularly for girls' academic self-efficacy. Previous studies have provided mixed findings on this issue. For instance, McGrath and Repetti (2000) found that when mothers were satisfied with their children's performance, both daughters and sons reported high levels of academic self-perceptions. However, when fathers were similarly satisfied with their children's academic performance, only boys reported high self-perceptions. Again, mother warmth was strongly associated with girls' academic achievement, but both mother warmth and father warmth were related to boys' achievement (Pinquart, 2016). The amount of time spent between mother-daughter and father-son dyads is generally higher than the amount of time spent in mixed-sex parent-child dyads (Maccoby, 2003), suggesting a stronger socialization effect for the same-sex parent-child dyads in the academic domain.

There were seven deterioration effects in total, and three of these were observed for the girls and four were observed for the boys. One important finding was that deterioration effects were more prevalent in the parental emotional warmth and rejection domains. Regarding the effect of literature self-efficacy, the boys do not seem to tolerate the effect of having

one parent showing higher levels of rejection although the other parent was not rejecting. The same inconsistent deterioration effect was observed for girls' math self-efficacy. In sum, negative co-parenting influenced boys' and girls' academic self-efficacy similarly. Inconsistent co-parenting, especially inconsistency in perceived emotional warmth and rejection, seems to predominantly deteriorate girls' math self-efficacy.

Overall, the girls seemed to be more open to the effects of perceived parenting and co-parenting behaviors, particularly in math self-efficacy. The general belief about girls' and boys' academic competence is that girls are more successful in language and related areas, and that boys are more successful in math and related areas (Pajares, 2002). Parents or teachers might share this biased assumption (Eccles et al., 1990; Voyer and Voyer, 2014). These beliefs, as a result, might create a gender difference in children's perceptions about their skills (Marsh, 1993; Parker et al., 2018). This study provided convergent results. As stated, the girls were higher on literature and the boys were higher on math self-efficacy. That said, a greater number of parenting behaviors ($N = 3$) predicted girls' math self-efficacy compared to their literature self-efficacy ($N = 1$), and the number of deterioration effects was higher in girls' math self-efficacy ($N = 3$) than in any other group. These findings, together, imply that girls represented a more sensitive profile of academic self-efficacy, and that this sensitivity was highly apparent in their math self-efficacy.

Although this study improves our understanding of the role of fathers, we should note several limitations. First, we used only child perceptions to measure the effect of parenting behaviors. Future research should also employ parents' reports of parenting behaviors and practices. Second, we examined the effect of parenting behaviors in four domains only. Future studies should test the effect of parenting and co-parenting with other dimensions, such as autonomy granting. Third, we had relatively low reliability values of parenting measures, particularly for culture-common parenting behaviors. We had fewer items to measure culture-common practices (i.e., guilt induction) that represent diverse guilt-inducing practices of Turkish parents. This might be one of the reasons for the inconsistent effects of guilt induction, especially on boys' LSE levels. Future studies should attempt to replicate these findings with more robust and culturally relevant measures of psychological control dimensions. Besides, deterioration and compensation effects should be interpreted with caution, since the inconsistent co-parenting groups did not statistically differ from each other. Finally, we used a very large sample size and four-point Likert scales, which might have decreased the size of correlations, although they remained statistically significant.

This study contributes to the extant research on fathering by assessing the unique role of fathers and co-parenting behaviors in primary school children's literature and math self-efficacy. Previous studies have mostly focused only on one parent who is generally the mother. However, the understanding about parenting should move forward in new directions; thus, fathers are needed to be more involved and visible in child development. The findings of this study suggest that the effect of one parent is not superior to the other considering that the number of significant effects for mothers and fathers was similar although the magnitude of the effects slightly varies. Still, it does not

underestimate the unique importance of fathers or mothers. As seen in the clear superiority of positive co-parenting effects, the presence and harmony of both parents create an optimal climate for high academic self-efficacy. This is particularly valuable for same-sex parent-child dyads. This study also marks that parental emotional warmth, as the universally positive parenting behavior, together with positive coparenting had the strongest positive effect on academic self-efficacy.

Our findings also have several practical implications, particularly in the development of parenting programs and policies. We know that academic self-efficacy is the motivational source of school success and contributes to children's academic achievement in the long run (Marsh and Martin, 2011). Thus, parenting intervention programs should especially focus on parental consistency and cooperation in specific domains of parenting behaviors and practices, since these are strongly related to academic self-efficacy. This study provides evidence that practitioners, teachers, or educational policymakers can focus on positive co-parenting practices to promote gains in academic efficacy and achievement as a general and fundamental strategy.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Middle East Technical University, Human Research Ethics Committee. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

NS was the principal investigator of the project, provided the data for the current study, double-checked the analysis, and reviewed and edited the whole manuscript. NS and DK contributed to the conceptualization and design of the study. DK organized the database, performed the statistical analysis, and wrote the first draft of the manuscript. Both authors contributed to the manuscript equally and approved the submitted version.

FUNDING

This research was supported by the Scientific and Technological Research Council of Turkey (Grant No: 105K102).

ACKNOWLEDGMENTS

The authors thank the project members, Melike Sayıl and Sibel Kazak-Berument, and project assistants for their contributions to the project.

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