

# The Effect of Paternal Co-Parenting on Preschool Children's Problem Behaviors: The Chain-Mediating Role of Maternal Parenting Burnout and Psychological Aggression

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**Objective:** With the social changes, a growing number of women have joined the workforce, leading to a shift in the traditional roles of child-rearing. There has been a growing focus on the significance of fathers' roles in child development, particularly the influence of fathers on children's problematic behaviors, making it an increasingly prominent issue. However, there is limited understanding regarding the potential mechanisms through which fathers may exert influence on children's problem behaviors. To address this gap, this study sought to investigate the link between paternal co-parenting and preschool children's problem behaviors, and the mediating effects of maternal parenting burnout and psychological aggression.

**Methods:** This study used the Personal Information Form and four scales to administer questionnaires to 1164 mothers of preschool children ( $M_{\text{age}} = 4.26 \pm 0.85$ ) in Guangdong Province, China. The collected data underwent processing and analysis using SPSS 22.0.

**Results:** Paternal co-parenting demonstrated a significantly positive correlation with problem behaviors among preschool children. The impact of paternal co-parenting on children's problem behaviors was mediated by maternal parenting burnout, maternal psychological aggression, and the combined effect of maternal parenting burnout and psychological aggression.

**Conclusion:** Maternal parenting burnout and maternal psychological aggression play a sequential mediating role between paternal co-parenting and problem behaviors among preschool children. This study revealed the internal mechanism through which paternal co-parenting influenced problem behaviors exhibited by children. It provides some evidence to support the important role of fathers in child development, and provides a reference for policymakers and educators to develop interventions for children's problem behaviors.

**Keywords:** paternal co-parenting, problem behaviors, maternal parenting burnout, psychological aggression, preschool children

## Introduction

Recently, there has been increasing global attention to problem behaviors among children.<sup>1</sup> The trend of problem behaviors in children is indicating an onset at younger ages, with a rising incidence. The Children's Blue Book: China's Child Development Report (2021) surveyed 73,992 children and adolescents in 15 Chinese cities. As a result, approximately 17.6% of children were found to exhibit emotional and problematic behaviors, with the incidence increasing every year.<sup>2</sup> Fu et al surveyed data on visits to children's hospitals across China and discovered a yearly 10% rise in the prevalence of mental health problems among children.<sup>3</sup> According to research, children who continued to exhibit problem behaviors in early childhood were more likely to face significant emotional and behavioral challenges in their adult lives, and may encounter adverse consequences such as engaging in criminal activities, substance abuse, and mental health disorders.<sup>4</sup> Hence, it is essential to place greater emphasis on addressing children's behavioral concerns. The persistent high prevalence of problem behaviors in children has focused attention on families which exert the most

significant influence on child development. Numerous studies have substantiated the correlation between family factors and children's mental health, social development, and problem behaviors.<sup>5-7</sup> Recently, the co-parenting system, which involves the father, mother, and child as a unique subsystem within the family system, has garnered significant attention.<sup>8-10</sup> According to family systems theory, the family is an organic whole composed of interrelated subsystems, such as the parent-child, spouse, and parental subsystem, among which co-parenting, as a unique system independent of the marital relationship, plays an important role in child development.<sup>11</sup> There is a wealth of research demonstrating that the quality of co-parenting affects problem behaviors exhibited by children.<sup>5,7,8,12</sup> Co-parenting with high levels of paternal support and cooperation between parents is associated with fewer externalizing behavior problems in children, while destructive and conflictual co-parenting leads to more externalizing behavior problems in children.<sup>13</sup>

With the social changes, there is a shift in the traditional roles of child-rearing. Traditionally, mothers have been deemed as the most suitable caregivers for raising children. However, due to economic development and evolving parenting ideologies, many families have transitioned from the traditional model where men were primarily breadwinners and women were homemakers to embracing the concept of co-parenting. The unique and irreplaceable role of fathers in child development is increasingly valued. Studies have demonstrated that fathers' performance in co-parenting has significant effects on children's adaptation,<sup>6,7</sup> emotional regulation,<sup>9</sup> problem behaviors,<sup>5,14</sup> and other aspects. As a result, the role of paternal co-parenting in children's psychological and behavioral problems has received increasing attention in recent decades. The impact of father co-parenting on child development may be direct or indirect by influencing other family subsystems,<sup>6</sup> which needs to be explored by more research.

Therefore, building upon previous research findings, this study takes the father's performance in co-parenting as the key factor to explore the impact of paternal co-parenting on problem behaviors among children and its mechanism, in order to provide suggestions and references for the healthy development of children.

## Paternal Co-Parenting and Problem Behaviors

Co-parenting is characterized by collaborative and coordinated parental efforts in raising children, involving shared or overlapping responsibilities, and it reflects the parental dynamics in child-rearing.<sup>15</sup>

According to the Ecological Model of Co-parenting, co-parenting's quality directly affects parents' personal parenting style and children's adaptation.<sup>15</sup> A longitudinal follow-up study revealed that positive co-parenting behavior at the age of 3 predicted fewer externalizing problem behaviors at the age of 4.<sup>13</sup> In research involving 5-year-old children, it was observed that the quality of co-parenting can notably forecast a reduction in children's externalizing problem behaviors.<sup>5</sup> Furthermore, even when accounting for the influence of marital relationships, individual parenting, and infant temperament, low levels of supportive behavior exhibited by fathers at 6 months were linked to high levels of problem behaviors at 12 months.<sup>16</sup> As an integral part of the family unit, a father significantly influences the development of children. For example, children in families without a father figure are more prone to problem behaviors manifested as internalizing or externalizing symptoms.<sup>17</sup> Additionally, their support and acknowledgment of the mother's parenting role in co-parenting also exert a significant influence on children.<sup>5,18</sup> Karberg et al conducted a study on paternal co-parenting reported by mothers and found that upon controlling for covariates such as gender, marital status, and parent's education level, the co-parenting quality of children before age 5 has a negative predictive effect on children's problem behaviors manifested as internalizing or externalizing symptoms at age 5.<sup>5</sup> Adequate evidence has shown that paternal co-parenting directly impacts children's adaptation. The higher the quality of paternal co-parenting, the fewer problem behaviors, and the better children's adaptation.

## The Mediating Effect of Maternal Parental Burnout

Parenting burnout encompasses a set of symptoms caused by long-term pressure and responsibilities associated with parental roles, such as emotional exhaustion related to parenting, intentionally maintaining emotional distance from the child, gradually decreasing sense of achievement from parenting activities, and difficulty in obtaining happiness from interaction with the child.<sup>19</sup> Drawing from the Balance Between Risks and Resources (BR<sup>2</sup>) theory, parenting burnout arises from a persistent imbalance in resource risk in the parenting field, which stems from inadequate resources for managing parental stress.

In line with the social support theory, social support is closely related to individual anxiety and stress.<sup>20</sup> For mothers, family and spouse are important sources of social support. Studies have found that the greater the father's perceived level of involvement in parenting, the lower the mother's parenting stress;<sup>21</sup> conversely, fathers' negative co-parenting performance may increase the mother's parenting stress.<sup>22</sup> Previous empirical studies have shown that high maternal parenting pressure may be related to the increase in children's social withdrawal, aggression, depression, along with other internalizing and externalizing problem behaviors.<sup>23–25</sup> Given that parenting stress is a precursor to parenting burnout,<sup>26,27</sup> the correlation between maternal parenting burnout and child problem behaviors might be more robust than the presently observed link between parenting stress and child adjustment. A longitudinal study has demonstrated that maternal parenting burnout predicted how children perceived maternal parenting hostility, and then influenced children's later problem behaviors manifested as internalizing or externalizing symptoms.<sup>28</sup> Therefore, maternal parenting burnout might serve as a mediating factor in the influence of co-parenting on children's problem behaviors.

## The Mediating Effect of Maternal Psychological Aggression

As one of the harsher disciplinary methods frequently employed by parents, psychological aggression entails utilizing verbal or symbolic aggression, such as shouting, scolding, and threatening, aiming at inducing psychological distress or fear in the child.<sup>29</sup>

Drawing from the Ecological Model of Co-parenting, co-parenting indirectly exerts influence on child development through parenting behaviors exhibited by parents.<sup>15</sup> Numerous research has demonstrated that co-parenting can affect parenting behavior.<sup>6,30</sup> Besides, several studies have indicated that hostile and competitive co-parenting can create tension in parent-child interactions, leading mothers to adopt harsher parenting styles towards their children.<sup>31</sup> Psychological aggression represents the most prevalent type of parental discipline.<sup>32</sup> High levels of psychological aggression predict children's negative development in multiple areas of emotion, cognition, and behavior, such as anxiety, depression, physical aggression, and verbal aggression.<sup>33,34</sup> In line with social learning theory, children acquire certain behavior patterns through observing and imitating their parents.<sup>35</sup> If the mother tries to restrain or stop a child's improper behavior through abuse or threat, the child is more likely to regard this aggressive behavior pattern as an effective strategy to solve problems and thus tends to use similar strategies to solve conflicts in communication with peers or other social situations. In addition, according to the hypothesis of emotional security, aggressive parenting styles such as rejection, ridicule, and threats adopted by mothers will destroy the emotional connection between parents and children, increase children's psychological insecurity, and then lead to elevated levels of internalizing problem behaviors in children such as anxiety and depression.<sup>36</sup> Therefore, maternal psychological aggression might mediate the correlation between co-parenting and problem behaviors exhibited by children.

## The Chain-Mediating Effect of Maternal Parental Burnout and Psychological Aggression

Reviewing the previous literature, the majority of studies treated maternal parenting burnout and psychological aggression as separate independent to explore their impact on children's problem behaviors. However, research has suggested that there is a correlation between maternal parenting burnout and psychological aggression.<sup>37–39</sup> From a biological perspective, stress can trigger and fuel anger,<sup>40</sup> while emotional and physical burnout may restrict executive resources that are available to curb negative behavior.<sup>41</sup> Mothers who are overworked or chronically exposed to parenting stress will fall into a state of parenting burnout, which can undermine their capacity to regulate negative parenting behaviors.<sup>27</sup> As a result, they might be more inclined to resort to strict disciplinary measures when facing challenges in raising children. Studies have shown that parenting burnout will lead to mothers' neglect and avoidance of children, and also lead to mothers' psychological aggression towards children, such as scolding, threatening, and using verbal violence against children.<sup>28,38,42</sup> Therefore, maternal parenting burnout and psychological aggression may act as consecutive mediators in correlation between co-parenting and problem behaviors exhibited by children.

## The Current Study

The quality of co-parenting in the family system has an important impact on child development, and the mechanisms of influence may be multiple and complex. Although the previous studies have made relevant theoretical explanations on the role of co-parenting and conducted some empirical studies, there is still a need for a thorough investigation into the ways in which co-parenting influences children's problem behaviors. There is relatively little research on paternal co-parenting and how it affects the child's development by influencing maternal parenting behavior. Considering that the number of children with problem behaviors is increasing year by year<sup>3</sup> and the global concern about children's problem behaviors,<sup>1</sup> how to find more effective solutions to improve children's problem behaviors has become urgent. As the direct caregivers of most children, parents are pivotal in facilitating children's adaptive development.<sup>4,3</sup>

Consequently, this study delves into the influencing mechanism of paternal co-parenting on problem behaviors exhibited by children and investigates the potential mediating roles of maternal parenting burnout and psychological aggression. This study will help to promote the in-depth development of related research fields, provide new evidence, and also have a certain practical guiding significance for family rearing. On the basis of previous studies, we constructed a hypothetical model (illustrated in Figure 1) and put forward the following hypotheses:

H1. There exists a positive correlation between paternal co-parenting and problem behaviors exhibited by preschool children.

H2. Maternal parenting burnout acts as a mediator in the impact of paternal co-parenting on problem behaviors in preschool children.

H3. Maternal psychological aggression serves as an additional mediating variable in the relationship between paternal co-parenting on problem behaviors in preschool children.

H4. Maternal parenting burnout and psychological aggression have chain-mediated effects on paternal co-parenting's influence on problem behaviors in preschool children.

## Methods

### Participants and Procedure

This is a cross-sectional study and data were collected using the convenience sampling method. We used the sample size formula to calculate the sample size. A relative error of 15% was allowed, thus accepting an absolute error  $\delta = 0.15\pi$  and a confidence interval of 95%. Therefore,  $\mu_a = 1.96$ , according to previous studies, the prevalence of emotional and behavioral problems among Chinese children was 17.6%<sup>2</sup> with  $\pi = 17.6\%$ . The minimum sample size in this study was  $n = [1.962 \times 17.6\% (1 - 17.6\%)] / (0.15 \times 17.6\%)^2 \approx 799$ . Considering 10% invalid responses, we expanded the minimum sample size to  $n = 799 \times (1 + 10\%) \approx 879$ .

Questionnaires were distributed to mothers of children in nearly 30 kindergartens in Guangdong province of China via the Internet in October 2023. At the beginning of the survey, we distributed 1170 questionnaires and actually returned

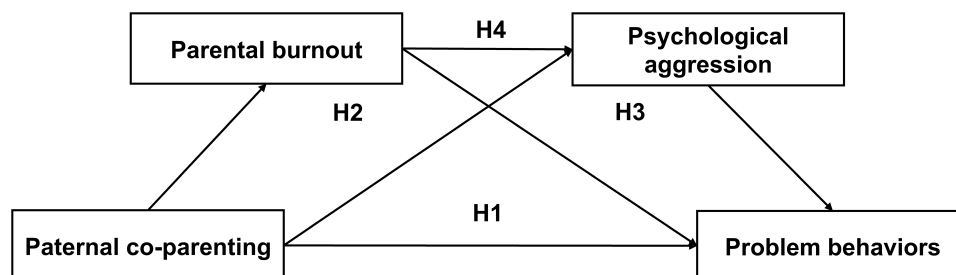


Figure 1 Hypothesized conceptual model.

1159. The inclusion criteria were as follows: 1) mothers of children aged 3–6 years old in Guangdong Province, China; 2) mothers who were willing to participate and could complete the questionnaire accurately. The exclusion criteria were: 1) missing data in the returned questionnaires; 2) the same answers for 85% of the items in the returned questionnaires; and 3) time to complete the questionnaires < 5 minutes. During the data screening and entry process, 18 questionnaires were declared invalid. As a result, a total of 1141 valid questionnaires were obtained, with a recovery rate of 97.5%. The mean age of the children was 4.26 years ( $SD = 0.85$ , ranging from 3.00 to 6.00), including 604 boys (52.9%) and 537 girls (47.1%). The study has obtained the informed consent of all participating parents, and parents are informed of the ethical principles of voluntary participation. According to the guiding principles of the Helsinki Declaration, the Research Ethics Committee of Guangzhou University approved the ethical review of this study.

## Measures

### Personal Information Form

The personal information form includes the child's age, gender, and whether they have siblings.

### Co-Parenting

Maternal perceptions of paternal co-parenting were measured using the Chinese version of the Brief Co-parenting Relationship Scale (Brief CRS).<sup>44</sup> The original scale was developed by Feinberg, Brown, and Kan from Pennsylvania State University in 2012.<sup>45</sup> The scale comprised 14 items and 7 sub-scales, encompassing co-parenting congruence, co-parenting intimacy, contact conflict, co-parenting assistance, co-parenting dysfunction, recognition of partner parenting, and division of housework. All items were scored using a Likert 7-level score, among which three items were reverse-scored, resulting in a complete score range of 0 to 84. The higher the score, the higher the co-parenting quality, that is, the more active the father's performance in co-parenting. The scale has exhibited favorable reliability and validity when used with the Chinese population.<sup>46</sup> In the context of this study, the scale exhibited a Cronbach's  $\alpha$  coefficient of 0.87.

### Parental Burnout

The Chinese Short Version of the Parental Burnout Assessment (S-PBA) was utilized to assess parental burnout.<sup>47</sup> The original scale was developed by Isabelle et al in 2018.<sup>19</sup> This abbreviated version consists of seven items (eg, "I don't feel like I can handle my role as a parent", "I want to show my children that I love them as I have in the past, but I don't feel like I can", etc.). All entries were assessed using a Likert 7-point scale. The scale's higher score indicated heightened levels of maternal parenting burnout. This scale has exhibited favorable reliability and validity when used with the Chinese population.<sup>48</sup> In the context of this study, the Cronbach's  $\alpha$  coefficient of the scale was 0.91.

### Psychological Aggression

The psychological aggression sub-scale of Parent-Child Conflict Tactics Scales (CTSPC) was adopted to investigate the psychological aggression of mothers against their children in recent years.<sup>32</sup> The original scale was created by Straus et al in 1998.<sup>29</sup> The sub-scale contains five items (eg, "yelling at the child angrily", "swearing at the child", or "Informing the child that they will be expelled or evicted from the house"). The mother self-rated the number of behaviors described in the entry in the last year, using a 7-level score. The scale's higher score indicated a greater severity of psychological aggression from the mother towards the child. This scale has exhibited favorable reliability and validity when used with the Chinese population.<sup>49</sup> In the context of this study, the scale exhibited a Cronbach's  $\alpha$  coefficient of 0.84.

### Problem Behaviors

In the Chinese edition of Social Skills Improvement System-Rating Scales (SIS-RS), the problem behavior sub-scale in the parental version is used to assess the progression of problem behaviors among children.<sup>50</sup> The scale consists of 33 questions with 5 dimensions, including externalizing problems (eg, "talking back to adults"), bullying problems (eg, "forcing others to do things they don't want to do"), hyperactivity problems (eg, "restless, wandering aimlessly"), internalizing problems (eg, "no energy, listless"), and autism problems (eg, "avoiding others"). A 4-point scale (from "0 = never" to "3 = almost always"), was employed to evaluate the frequency of the child's behaviors. The scale's higher score indicated more severe problem behaviors. This scale has exhibited favorable reliability and validity when used with

the Chinese population.<sup>51</sup> In the context of this study, Cronbach's  $\alpha$  coefficients of the total scale and sub-scales ranged from 0.80 to 0.95.

## Data Analysis

For this study, the data collection and analysis were conducted using SPSS 22.0 software. First, descriptive statistics (mean and standard deviation) and standardization were performed on independent variables (paternal co-parenting), mediating variables (maternal parenting burnout, maternal psychological aggression), and dependent variables (child problem behaviors). Second, the bivariate analysis of the correlation between problem behaviors and independent and intermediary variables was conducted using the Pearson correlation. Correlations between variables were represented by the correlation coefficient  $r$  and  $p < 0.05$  indicating that the correlation was statistically significant. Third, Model 6 in the SPSS macro program PROCESS was employed to examine the mediating role of maternal parenting burnout and psychological aggression between paternal co-parenting and child problem behaviors.<sup>52</sup> Standardized path coefficients were expressed as  $\beta$ , with  $p < 0.05$  representing that the path was statistically significant. Finally, prior research studies have suggested that the bias-corrected percentile Bootstrap method is more effective than the traditional Sobel method.<sup>53</sup> So, the mediation hypothesis was tested on a sample of 5000 using the bias-corrected bootstrap method. Gender, age, and only child were included in the model as covariates. The indirect effects were considered statistically significant when the 95% confidence interval (CI) did not include 0.

## Result

### Common Method Biases Tests

All data in this study were obtained through self-reported questionnaires, potentially leading to common method biases influencing the results. To mitigate this potential bias, measures such as ensuring anonymity, separate arrangements of different questionnaires, reverse items, and emphasizing data confidentiality. In addition, the Harman single factor test was utilized for a post-statistical test.<sup>54</sup> The results indicated 9 factors had a value greater than 1, with the maximum factor variance explained of 25.86% (<40%); therefore, the data in the study were not significantly affected by common method biases.

### Preliminary Analysis

Demographic variables such as gender and age of the children as well as key variables such as paternal co-parenting were analysed through Person correlation. As shown in Table 1, paternal co-parenting exhibited a negative correlation with maternal parenting burnout, maternal psychological aggression, and problem behaviors among preschool children ( $p = 0.000 < 0.001$ ); Maternal parenting burnout demonstrated a positive correlation with psychological aggression and problem behaviors in preschool children ( $p = 0.000 < 0.001$ ). Additionally, maternal psychological aggression exhibited a negative correlation with preschool children's problem behaviors ( $p = 0.000 < 0.001$ ). In addition, there was a significant correlation between the age of the child and paternal co-parenting ( $p = 0.039 < 0.05$ ). There was a significant correlation between the gender of the child and problem behaviors ( $p = 0.023$ ).

**Table 1** Descriptive Statistics and Correlation Analysis

	Mean	SD	1	2	3	4	5	6	7
1. Age	4.26	0.85	–						
2. Gender	0.53	0.50	–0.01	–					
3. Only child	0.25	0.43	–0.11**	0.05	–				
4. Paternal co-parenting	59.07	13.41	–0.06*	–0.02	0.06*	–			
5. Parental Burnout	12.51	6.37	–0.02	0.04	–0.04	–0.42***	–		
6. Psychological Aggression	22.62	25.63	0.04	0.05	–0.07*	–0.27***	0.34***	–	
7. Problem behaviors	13.99	10.64	–0.01	0.07*	0.05	–0.32***	0.38***	0.32***	–

Notes: \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ . Gender: 1 = boys, 0 = girls; Only Child: 1 = only child, 0 = not only child.

Abbreviation: SD, standard deviation.

**Table 2** Regression Analysis of the Relationship Between Paternal Co-Parenting and Problem Behavior

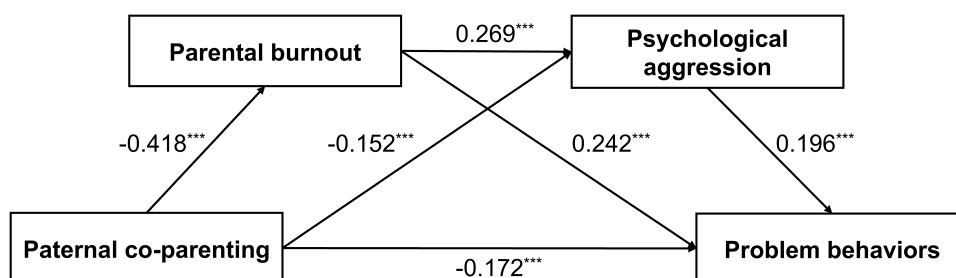
Regression Equation		Fitting Index			Significance	
Result Variable	Predictor Variable	R	R <sup>2</sup>	F	$\beta$	t
Problem behaviors	Age	0.332	0.110	35.231***	-0.023	-0.686
	Gender				-0.127	-2.260*
	Only child				-0.060	-1.698
	Paternal co-parenting				-0.325	-11.571***
Parental Burnout	Age	0.424	0.179	62.053***	-0.049	-1.542
	Gender				-0.079	-1.456
	Only child				0.040	1.198
	Paternal co-parenting				-0.418	-15.471***
Psychological Aggression	Age	0.369	0.137	35.870***	0.036	1.089
	Gender				-0.072	-1.296
	Only child				0.047	1.350
	Paternal co-parenting				-0.152	-4.967***
	Parental Burnout				0.269	8.833***
Problem behaviors	Age	0.464	0.215	51.745***	-0.015	-0.488
	Gender				-0.090	-1.696
	Only child				-0.081	-2.441*
	Paternal co-parenting				-0.172	-5.864***
	Parental Burnout				0.242	8.066***
	Psychological Aggression				0.196	6.924***

**Notes:** Standardization has been applied to all variables in the model. The control variables include age, gender, and only child. The independent variable is paternal co-parenting, while the outcome variable is problem behaviors. \* $p < 0.05$ , \*\*\* $p < 0.001$ .

$< 0.05$ ). Being an only child was significantly associated with paternal co-parenting ( $p = 0.048 < 0.05$ ) and psychological aggression ( $p = 0.015 < 0.05$ ).

### Multiple Mediating Model Analysis

After standardizing all variables, maternal parenting burnout and psychological aggression exhibited the mediation effect in the link between paternal co-parenting and problem behaviors exhibited by preschool children was tested by SPSS macro PROCESS (Model 6) developed by Hayes. The regression equation included age, sex, and only-child status as covariates. The findings are shown in Table 2 and Figure 2.



**Figure 2** Chain-mediation model testing the indirect link between paternal co-parenting and problem behaviors exhibited by preschool children through maternal parental burnout and psychological aggression.

**Note:** \*\*\* $p < 0.001$ . All coefficients are standardized.

**Table 3** Maternal Parental Burnout and Psychological Aggression in the Mediation Effect Analysis

	Indirect Effects	Boot SE	Boot LLCI	Boot ULCI	Relative Mediation Effect
Total indirect effect	-0.153	0.023	-0.200	-0.112	47.07%
Indirect effect 1	-0.101	0.019	-0.142	-0.066	31.07%
Indirect effect 2	-0.030	0.077	-0.046	-0.016	9.23%
Indirect effect 3	-0.022	0.005	-0.033	-0.013	6.77%

**Notes:** Indirect effect 1: paternal co-parenting → parental burnout → problem behaviors; indirect effect 2: paternal co-parenting → psychological aggression → problem behaviors; indirect effect 3: paternal co-parenting → parental burnout → psychological aggression → problem behaviors.

**Abbreviations:** LL, lower limit; CI, confidence interval; UL, upper limit; SE, standard error.

Paternal co-parenting exhibited a significant correlation with problem behaviors exhibited by preschool children ( $\beta = -0.325$ ,  $p = 0.000 < 0.001$ ), supporting Hypothesis 1. Paternal co-parenting demonstrated a significant influence on maternal parenting burnout ( $\beta = -0.418$ ,  $p = 0.000 < 0.001$ ) and psychological aggression ( $\beta = -0.152$ ,  $p = 0.000 < 0.001$ ). Maternal parenting burnout exhibited a significant correlation with psychological aggression ( $\beta = 0.269$ ,  $p = 0.000 < 0.001$ ) and problem behaviors in preschool children ( $\beta = 0.242$ ,  $p = 0.000 < 0.001$ ). Furthermore, maternal psychological aggression was found to be a significant predictor of preschool children's problem behaviors ( $\beta = 0.196$ ,  $p = 0.000 < 0.001$ ). In the light of above findings, maternal parenting burnout and psychological aggression serve as significant mediators between paternal co-parenting and problem behaviors among preschool children, respectively. In addition, maternal parenting burnout and psychological aggression were also found to have a significant chain-mediating effect on the association between paternal co-parenting and problem behaviors in preschool children, thereby supporting hypotheses 2–4.

To estimate the value of the mediating effect, we conducted 5000 bootstrap samples at a 95% confidence level. The results demonstrated the mediating role of maternal parenting burnout and psychological aggression in the relationship between paternal co-parenting and problem behaviors among preschool children. As shown in Table 3, the 95% confidence intervals for all three indirect paths did not encompass 0, suggesting the significant mediating effect of maternal parenting burnout (indirect effect value  $-0.101$ ), the significance of the mediating effect of maternal psychological aggression (indirect effect value  $-0.030$ ), and the significance of the chain-mediating effect of maternal parenting burnout and psychological aggression (indirect effect value  $-0.022$ ). The total indirect effect size of paternal co-parenting on problem behaviors in preschool children was  $-0.153$ , and the mediating effect contributed to 47.07% of the total effect. Hypotheses 2–4 were confirmed again.

## Discussion

In summary, drawing from family system theory, by establishing a chain mediation model, this study explores the correlation between paternal co-parenting and children's problem behaviors, along with the mediating role of maternal parenting burnout and psychological aggression. The findings reveal a significant direct correlation between paternal co-parenting and problem behaviors exhibited by children, indicating that more negative paternal involvement in co-parenting is linked to a higher likelihood of children exhibiting problem behaviors, consistent with previous research.<sup>6,55</sup> The validation of social learning theory is also further supported by the direct effect of paternal co-parenting on problem behaviors exhibited by children.<sup>35</sup> According to this theory, the supportive and negotiated solution style shown by parents in co-parenting may become a good example of interpersonal interaction observed and learned by children, thus enabling children to exhibit more prosocial behaviors and less internalizing problem behaviors.<sup>56</sup>

Beyond the direct effect, the quality of paternal co-parenting may impact children's problem behaviors may also be produced through three mediating paths: (1) through the mediation of maternal parenting burnout; (2) through the mediation of maternal psychological aggression; (3) through the chain-mediated influence of maternal psychological aggression by influencing maternal parenting burnout. In summary, maternal parenting burnout and psychological aggression partially act as mediators in the association between paternal co-parenting and problem behaviors exhibited by children.



## Mediating Role of Maternal Parenting Burnout in the Correlation Between Paternal Co-Parenting and Children's Problem Behaviors

Paternal co-parenting mediated by maternal parenting burnout affects problem behaviors exhibited by children, aligning with the theoretical hypothesis. Based on the risk-resource balance theory, maternal parenting burnout arises because of the imbalance between high parenting requirements (risk factors) and limited parenting resources (protective factors). As the most direct and convenient protective resources available to mothers in the family, the cooperation and support shown by fathers in co-parenting can alleviate the adverse effects of maternal parenting burnout on the enhancement of social and emotional competencies among children.<sup>57</sup> The findings of this study align with the findings of prior research as well, which found that paternal co-parenting is negatively correlated with maternal parenting burnout.<sup>58</sup> Negative emotions generated by negative interactions of co-parenting can overflow into the parent-child relationship, causing heightened levels of stress for parents. If the mother does not have adequate resources at this time, such as protective resources from the father, to cope with stress, then high levels of parenting burnout can result.<sup>6</sup> Mothers with high levels of parenting burnout will show emotional exhaustion and will intentionally show emotional distance from their children, and children cannot get warm and intimate relationships with their mothers, which will render children more susceptible to internalizing problem behaviors like autism and depression, and externalizing problem behaviors such as aggression.

## Mediating Role of Maternal Psychological Aggression in the Correlation Between Paternal Co-Parenting and Children's Problem Behaviors

Paternal co-parenting was mediated by maternal psychological aggression to affect problem behaviors exhibited by children, aligning with the theoretical hypothesis. According to the co-parenting ecological model, the indirect influence of co-parenting on child development occurs through the parenting behaviors of the parents.<sup>15</sup> Family system theory also holds that a family is composed of many different subsystems, which are both independent and interacting with each other.<sup>59</sup> This study verified the influence of the co-parenting subsystem on the parent-child subsystem, and how the quality of a father's participation in co-parenting affects the psychological aggression of mother to child. Furthermore, the findings of this study are also in line with previous research, which found that high-quality co-parenting can promote parents' positive parenting style.<sup>6</sup> In co-parenting, the co-parenting performance of the father's cooperation and support can reduce the maternal parenting stress, so that the mother has enough resources to use effective parenting behaviors. On the other hand, when the father displayed disparaging and destructive parenting behaviors, the mother experienced increased parenting stress and was more inclined to use negative parenting styles such as "threatening to hit the child" or "telling the child that he/she will be sent away". These threats can instill constant worry in children, leading to increased insecurity.<sup>49</sup> Consequently, in an attempt to alleviate this insecurity, children may exhibit internalizing problem behaviors like depression or anxiety, and externalizing problem behaviors such as aggression.

## The Chain-Mediating Effect of Maternal Parenting Burnout and Psychological Aggression in the Correlation Between Paternal Co-Parenting and Children's Problem Behaviors

In line with the research hypothesis, this study revealed that paternal co-parenting also exerted an influence on problem behaviors exhibited by children through the chain mediation of maternal parenting burnout and then influenced maternal psychological aggression. Previous studies have shown that when the spouse of the primary caregiver provides effective support, the caregiver's parenting stress is reduced.<sup>60</sup> On the other hand, if the father shows hostility and opposition to the maternal parenting behavior, the mother's parenting stress will continue to rise. In a state of continuous high stress, mothers are very prone to parenting burnout.<sup>61</sup> Parents who experience exhaustion from the demands of parenting may exhibit decreased sensitivity towards their parental responsibilities and resort to psychological aggression towards their children. Consequently, children may struggle to develop secure attachment bonds with their parents, leading to diminished emotional security and increase the display of problem behaviors in children. Moreover, children exposed to psychological aggression from their mothers may learn and adopt aggressive conflict resolution strategies, thereby increasing their problem behaviors. This result may also be related to the Chinese cultural background. In recent decades, China's rapid economic development has led to the pursuit of a higher level of quality of life, and a large number of mothers have stepped out of their role as "full-time mothers" and began to devote themselves to the workplace.

However, the pressure on mothers has increased as they need to combine work and child-rearing at the same time. In the context of Chinese culture, influenced by the traditional idea of breadwinning men and homemaking women for many years, most fathers are less involved in child-rearing. The lower quality of fathers' participation in co-parenting will further exacerbate mothers' stress and parenting burnout, which can lead to psychological rejection and aggression towards children, finally triggering problem behaviors in children.

Family systems theory emphasizes the importance of the co-parenting subsystem and the parent-child subsystem as central proximal determinants of child subsystems.<sup>11</sup> Previous studies have confirmed the positive predictive effects of good paternal co-parenting and mother's parenting behaviors on children's problem behaviors, respectively.<sup>5,13,16,36</sup> However, the present study found that paternal co-parenting, maternal parenting burnout, and maternal psychological aggression would collectively play a significant role in children's problem behaviors. More importantly, paternal co-parenting quality affects maternal parenting burnout and psychological aggression, which in turn has an impact on the children's problem behavior. This further validates the Ecological Model of Co-parenting, which states that co-parenting can have an indirect effect on child development through parenting behavior.<sup>15</sup>

## Conclusions

Taking into account the cultural context of China, this study comprehensively considered the influence of both fathers and mothers on problem behaviors exhibited by children and their influencing mechanisms. The mediation model was constructed after integrating the family systems theory, the Balance Between Risks and Resources theory, the social support theory, and the co-parenting ecological model. This study revealed that paternal co-parenting had a negative predictive effect on problem behaviors exhibited by preschool children; Maternal parenting burnout and psychological aggression partially served as mediators the association between paternal co-parenting and problem behaviors among preschool children, respectively. And, maternal parenting burnout and psychological aggression also served as mediators in a chain-like manner between paternal co-parenting and problem behaviors among preschool children. This study can provide some evidence to support the significant impact of fathers on child development, and provides a novel approach to addressing children's behavioral issues.

## Limitations and Future Research Directions

There were limitations to this study. First of all, all the data in this study were collected using a self-stated questionnaire. Although some controls were taken during data collection, the Harman single factor test was conducted during statistical analysis to ensure no statistically significant common method bias. However, self-reported data from the same source may still introduce bias. Future studies should collect data from multiple sources, such as fathers, mothers, and children, to minimize the impact of common method bias on the results.

Second, this study used convenient sampling methods to include children and their mothers from more than 20 kindergartens in Guangdong provinces and did not include groups from additional regions. Therefore, the findings of this study may not be easily generalizable. Subsequent research should broaden the geographic scope of sample selection, and use samples from different backgrounds to evaluate our hypothesis model, so as to confirm the broad applicability of the conclusions in this study.

Third, a cross-sectional design was used in this study, and did not directly establish causality. Based on the family system theory, family subsystems are independent and engage with each other, and children's problem behaviors may also have an influence on the parent-child subsystem and co-parenting subsystem. In order to clarify whether variables are causally related, future studies can employ a longitudinal research design, such as collecting data on relevant variables at different time points, and using data analysis methods such as the potential growth model or cross-lag model to investigate the causal links between variables.

Finally, this study only selected paternal co-parenting as independent variables, and parenting burnout and psychological aggression as mediating variables to explore the mechanism of influence on problem behaviors exhibited by children. The impact of family factors on problem behaviors exhibited by children is diverse and complex, and the influencing factors are not only co-parenting, parenting burnout, and psychological aggression variables in this study. For a more comprehensive description of the effects of family factors on children's problem behaviors, future studies can include other family factors for analysis, such as parental psychological control, physical aggression, and other factors.

## Theoretical and Practical Implications

In spite of these limitations, our research findings carry substantial theoretical and practical significance. In theory, this study focused on the mechanism of influence of paternal co-parenting on problem behaviors exhibited by children. After integrating family system theory, the Balance Between Risks and Resources theory, social support theory, and the co-parenting ecological model, a model of “paternal co-parenting - mother parenting burnout - mother psychological aggression - children’s problem behaviors” was constructed to elucidate the impact of paternal involvement in co-parenting on behavioral issues among children. This study has enriched the investigation into the correlation between paternal co-parenting and children’s problem behaviors, and provided new evidence for the link between paternal co-parenting and problem behaviors exhibited by children in the Chinese cultural background. In addition, prior research emphasized the effect of mothers on problem behaviors among children. Fathers, however, play a critical role in a child’s development.<sup>62</sup> In this study, the father’s performance in co-parenting was incorporated into a hypothetical model to investigate the association between paternal co-parenting, maternal parenting burnout, maternal psychological aggression, and problem behaviors exhibited by children, in order to establish a theoretical and practical foundation for addressing children’s behavioral issues.

In practical terms, this study is of great value to the improvement strategies of problem behaviors among children. The results of this research validated the negatively predictive influence of paternal co-parenting on problem behaviors exhibited by children, highlighting the significance of fathers in child-rearing. Fathers need to realize that parenting is not the only responsibility of mothers, and they need to realize the significant influence they can have on the parenting behavior of their spouses and the problem behaviors of their children. Throughout the process of nurturing children, the father and the spouse should support each other and coordinate, including the concept of parental rearing, emotional integration, and behavioral coordination. Therefore, interventions that enhance father involvement and co-parenting are therefore one way to reduce problem behaviors in children.<sup>62</sup> Furthermore, the chain mediation model validated in this study provides another way to improve children’s problem behaviors, that is, to cultivate mothers’ good stress-coping ability, such as mindfulness training methods. Emphasis should be placed on developing the mother’s own protective psychological resources so that the mother can better use her psychological resources to cope with the negative effects of adverse factors, for instance, maternal helplessness and stress caused by lower paternal co-parenting. Reducing the frequency of maternal parenting burnout and bad parenting behaviors will effectively decrease the occurrence of behavioral issues in children.

## Data Sharing Statement

The authors will provide unrestricted access to the raw data supporting the conclusions of this article.

## Institutional Review Board Statement

Guangzhou University’s ethics committee reviewed and approved the research involving human participants. Participants were explicitly informed that their responses to the task would remain anonymous and confidential.

## Informed Consent Statement

The participants consented to the processing of their relevant data for this research project and did so voluntarily.

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## Disclosure

The authors of this article confirm that there are no conflicts of interest either among themselves or with their institution.

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