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Parenting styles across generations and children's social-emotional development: The mediating role of caregivers' mental health

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ABSTRACT

Parenting styles play a pivotal role in formulating effective family policies to support early childhood development, with enduring intergenerational implications for children's outcomes. Drawing on survey data from children aged 6–24 months and their primary caregivers, this study investigates whether the mental health of the second generation (G2) mediates the relationship between the parenting styles of the first generation (G1) and the social-emotional development of children in the third or fourth generation (G3/G4). In a three-generation model, gendered parenting by G1 predicts warm parenting behaviors in G2, whereas hostile parenting by G2 negatively affects the social-emotional competence of G3. In the four-generation model, overprotective parenting by G1 exerts an indirect effect on social-emotional problems in G4, mediated by G2's mental health. Notably, the positive influence of protective parenting by G1 fathers diminishes with lower educational attainment in G2, while the adverse effects of protective parenting by G1 mothers intensify with higher G2 education. These findings underscore the importance of early preventive interventions to improve caregivers' mental health and parenting practices during early childhood.

Keywords: parenting styles; social-emotional development; mental health; intergenerational analysis; mediation

Introduction

The persistent rural-urban disparity in China poses a significant challenge to the nation's human capital accumulation and long-term development. Although the government has implemented a series of economic reforms and investment policies,

substantial gaps in early human capital development between rural and urban children remain, impeding sustainable and equitable progress. This issue is particularly critical given that rural children will comprise a considerable share of China's future workforce. A fundamental factor underlying this disparity is the limited early developmental potential among rural children, a dimension that social-emotional development represents, a crucial yet often overlooked aspect.

Early social-emotional development is foundational to a child's lifelong growth, influencing a wide range of outcomes (Masten & Cicchetti, 2010). Core competencies in this domain, such as emotion management, conflict resolution, and positive social interaction, are essential for healthy adjustment and resilience (Domitrovich et al., 2017). These skills are particularly critical for economically disadvantaged children, who face greater risks of emotional and behavioral difficulties that can adversely affect their academic achievement and overall well-being (Bøe et al., 2014). Therefore, identifying the factors that promote positive social-emotional adjustment is crucial for fostering the holistic development of rural children.

Driven by the rural-to-urban migration of young and middle-aged laborers, social transformations in China have significantly reshaped family structures. In regions with substantial out-migration, intergenerational dependency families, typically consisting of left-behind elderly and children, have become increasingly common. This shift has generated a distinct need to examine intergenerational influences on child development, as multi-generational caregiving arrangements frequently supplant traditional two-generation parenting dynamics. The present study focuses on two such family configurations in rural China: three-generation families, where mothers (G2) act as primary caregivers to children (G3), examining the influence of grandparents' (G1) parenting styles on G3's social-emotional development; and four-generation families, where grandmothers (G2) serve as primary caregivers to children (G4) in the absence of parents, exploring the role of great-grandparents' (G1) parenting styles in shaping G4's social-emotional outcomes.

Scholarly interest in early social-emotional development has increased considerably, with research consistently identifying two major predictors: caregivers' mental health and parenting styles. Caregiver mental health serves as both a protective and a risk factor in children's socioemotional growth. For example, caregivers experiencing unmanaged stress may display irritability or emotional withdrawal, which can impair parent-child interaction quality and heighten children's susceptibility to internalizing issues such as anxiety or externalizing behaviors like aggression (Austin et al., 2005; Gutteling et al., 2005; Hawkins & Weis, 1985; Koutra et al., 2013). In contrast, caregivers with positive psychological well-being are more inclined to provide sensitive and nurturing care, which supports the development of self-esteem and prosocial skills in children. Parenting styles, beyond their association with mental health, have also been consistently associated with social-emotional outcomes (Baumrind, 1989; Qiu & Shum, 2022; Walton & Flouri, 2010), and several studies have

examined moderating variables, such as cultural context and child gender, in this relationship (Dwairy, 2004).

While existing research has established parenting styles and mental health as important predictors of early social-emotional development, significant gaps remain in our understanding. Most studies in this area are limited to two-generation models, focusing primarily on the association between parents' mental health or parenting practices and children's emotional outcomes. Within three-generation frameworks, only one study has examined the intergenerational link between grandparents' expressive suppression and grandchildren's emotion regulation, finding no significant association (Qiu & Shum, 2022). The long-term, cross-generational dynamics involving caregivers' parents' parenting approaches, caregivers' mental health, and children's early development thus represent a critical and understudied area. To address this gap, the present study adopts a comprehensive intergenerational family framework to examine how the parenting styles of caregivers' parents (G1) influence the social-emotional development of subsequent generations (G3/G4), with caregivers' (G2) mental health potentially serving as a mediating mechanism.

The mediating role of caregivers' mental health becomes particularly critical in contexts characterized by compounded adversities, such as economic hardship or intergenerational stress transmission. Under these conditions, caregivers' psychological well-being serves as a pivotal mechanism through which environmental stressors influence child developmental outcomes (Repetti et al., 2002). This is highly relevant to rural Chinese families, where left-behind caregivers frequently manage the dual responsibilities of agricultural work and child-rearing. Here, unaddressed mental health concerns may exacerbate the detrimental effects of limited resources on children's social-emotional development (Sun & Zhou, 2020). Therefore, acknowledging the centrality of caregivers' mental well-being enables researchers to elucidate the pathways through which intergenerational parenting styles affect children, not only through direct parenting practices but also through the emotional states transmitted across generations.

Education, which encompasses general knowledge, rational thinking, emotional regulation, and social competencies, serves as a protective factor against mental health issues (Hahn & Truman, 2015). Prior research has demonstrated that higher educational attainment enhances caregivers' life satisfaction and positively influences children's psychological well-being, mainly by fostering a stronger sense of control and self-acceptance, thereby reducing the risk of anxiety and stress (Hahn & Truman, 2015). It is worth noting, however, that existing studies on parenting and child anxiety have predominantly centered on mothers. This raises an important question: What is the role of the second generation's (G2) educational attainment in shaping the relationship between the first generation's (G1) parenting styles, G2's mental health, and the socio-emotional development of the third and fourth generations (G3/G4) within Chinese families?

This study examines the intergenerational dynamics among parenting styles, mental health, and child development within three- and four-generation Chinese families. Specifically, it investigates the relationships between G1's parenting styles, G2's parenting behaviors, G2's current mental health status, and G3/G4's social-emotional outcomes. The research aims to: (1) explore the intergenerational transmission of parenting styles and their influence on descendants' social-emotional development; (2) assess the mediating role of G2's mental health in the association between G1's parenting and G3/G4's developmental outcomes; and (3) analyze the moderating effect of G2's educational attainment on the relationship between G1's parenting styles and G2's mental health. The conceptual framework guiding this study is presented in Figure 1.

This study, adopting a multigenerational framework, is among the first to demonstrate that G1's overprotective parenting style can predict social-emotional development in G3 and G4, even in the absence of direct interaction. Furthermore, it reveals distinct effects of fathers' and mothers' parenting styles across different historical contexts within three- and four-generation family structures. These differences are interpreted through the lens of gendered parenting roles in Chinese households, a dimension frequently overlooked in previous intergenerational studies on parenting.

1. Theoretical framework

2.1 Parenting style of G1 and mental health of G2

G1's parenting style, shaped by cultural norms, historical contexts, and socioeconomic conditions, is a foundational determinant of G2's mental health, a relationship well supported by cross-cultural evidence. Grounded in family systems theory (Kerr & Bowen, 1988) and the interpersonal acceptance-rejection theory (IPAR Theory, Rohner, 2016), G1's parenting behaviors influence G2's psychological well-being by either fostering or undermining emotional security, self-esteem, and resilience to stress.

Across diverse settings, specific parenting styles of the first generation (G1) consistently correlate with the mental health outcomes of the second generation (G2). In rural China, Wang et al. (2024) observed that G1's authoritarian parenting, marked by physical coercion and non-reasoning punitive strategies, was associated with elevated levels of depression and anxiety in G2. In contrast, G1's authoritative parenting was linked to lower psychological distress. These findings are consistent with those of Peng et al. (2021), who used the Short Egna Minnen Beträffande Uppfostran (S-EMBU) scale in a sample of Chinese adolescents, demonstrating that G1's emotional warmth contributes to higher self-esteem and reduced psychological inflexibility in G2, both of which are key protective factors for mental health. Conversely, G1's rejection and overprotection were found to heighten G2's

vulnerability to depression by undermining self-worth and reinforcing feelings of helplessness.

Notably, G1's parenting style influences G2's mental health through both direct and indirect mechanisms. Directly, emotional warmth from G1 fosters a secure attachment base in G2, which helps buffer stress reactivity. Indirectly, overprotective parenting by G1 may constrain G2's autonomy, thereby increasing psychological inflexibility and anxiety (Bowlby, 1977). For instance, drawing on data from the Future of Families and Child Wellbeing Study, De Palma et al. (2023) demonstrated that parenting practices during distinct childhood stages shape mental health outcomes in early adulthood by modulating adolescent brain development. Specifically, harsh parenting was found to disrupt global and corticolimbic circuitry, whereas warm parenting in middle childhood strengthened emotion-regulatory neural pathways, thereby mitigating mental health risks. Together, these findings underscore G1's parenting style as a key upstream predictor of G2's mental health, with effects that endure across the life course.

H1: The parenting style of G1 is associated with the mental health problems and parenting styles of G2.

2.2 Mental Health of G2 and Socio-Emotional Development of G3/G4

G2's mental health serves as a pivotal proximal predictor of G3/G4's social-emotional development, with its influence mediated through caregiving quality, parent-child interaction, and the family's emotional climate. Grounded in the social development model (Hawkins & Weis, 1985), this relationship remains consistent across cultural contexts, yet is moderated by variations in family structure and parental dyadic dynamics.

In rural China, utilizing the Strengths and Difficulties Questionnaire (SDQ), Wang et al. (2024) identified a correlation between G2's depressive symptoms and increased social-emotional problems alongside reduced prosocial behaviors in G3. This direct effect is exacerbated by G2's diminished capacity for sensitive caregiving; specifically, G2 individuals with anxiety symptoms demonstrate less responsive interactions with G3, which impedes the development of emotion regulation (Wang et al., 2024). A parallel finding was reported by De Palma et al. (2023) in Australian families with children aged 0–3, where parental low reflective functioning, often associated with poor mental health, was found to predict children's social-emotional development, as parents struggle to interpret their children's internal states accurately.

Supporting the perspective of family systems theory (Bowen & Kerr, 1988), which contends that child outcomes are products of the whole family system, the Japanese Family Study (Lee, 2022) provides clear evidence. Its analysis of 493 families revealed that the influence of G2's mental health on G3 is interdependent: the beneficial effect of maternal psychological well-being on G3's outcomes (measured by SDQ) is fully

realized only when the father's mental health is also high. This demonstrates that parental impact is defined by collective dyadic functioning rather than by the sum of individual contributions.

H2: Mental health problems and parenting styles of G2 are associated with the social-emotional development of G3/G4. Therefore, mental health problems and parenting styles of G2 mediate the relationship between the parenting styles of G1 and the social-emotional development of G3/G4.

2.3 The moderating role of the education of G2

The relationship between parenting style and childhood anxiety is often analyzed through the lenses of acceptance and control. Acceptance, demonstrated through warm and responsive interactions, facilitates anxiety reduction by supporting the child's development of emotion regulation and distress tolerance. In contrast, controlling parenting tends to promote dependence and reduce the child's perceived mastery, potentially creating a cognitive bias that interprets events as beyond one's control, thus heightening trait anxiety according to the model proposed by Chorpita and Barlow (1998).

While existing literature has examined moderating factors such as child age and gender (McLeod et al., 2007), the potential moderating role of education remains unexplored. Given its established association with an enhanced internal locus of control and lower anxiety levels (Hahn & Truman, 2015), investigating whether G2's educational attainment moderates the link between G1's parenting style and G2's mental health becomes critical. Such inquiry is essential for designing effective, targeted interventions and providing nuanced family support.

Therefore, we proposed the following hypothesis:

H3. The effect of the mental health of G2 on the social-emotional development of G3/G4 is moderated by the educational attainment of G2.

2. Methods

3.1 Study participants

This study was conducted in the summer of 2018 in a county in Jiangxi Province, China, which serves as a representative site for resource-limited rural areas. At the time of data collection, the county was designated as state-level poor (a status it retained until the end of 2019). Its predominantly rural nature is reflected in the population: 243,866 of the 387,334 residents (approximately 63%) held rural hukou. With a per capita GDP of RMB 15,835 (USD 2,297) in 2018 (Jiangxi Bureau of Statistics, 2019), the county's economic development was near the average for all poor counties in China that year (National Bureau of Statistics of China, 2020). Additionally, the average educational attainment of caregivers in the sample was slightly above primary school level, lower than both provincial and national averages (National Bureau of Statistics

of China, 2020). The participants constituted a representative sample of low-SES households from rural East China, with respect to income and education.

3.2 Data collection

Ethical approval for this study was granted by the Institutional Review Board (No. IRB00001052-19132). Informed consent was obtained from all parents or primary caregivers after explaining the study's purpose. Data collection spanning three weeks was conducted by 50 enumerators who had undergone a one-week intensive training program. The training ensured proficiency in standardized procedures, including observational techniques, administering child development tests, and collecting socioeconomic data from caregivers, with practical exercises conducted on real newborns. Furthermore, a one-day pilot survey was implemented in communities comparable to the sample villages prior to formal data collection.

The study methods and questionnaire were meticulously designed during the proposal phase. A series of rigorous quality control measures was implemented to ensure data quality. This included pretesting the instrument in sample areas to identify and rectify ambiguous items or design flaws that could introduce bias. Additionally, cross-checks were conducted at the enumerator level, complemented by routine special investigations by the research team. These procedures enabled the timely detection and resolution of anomalies at every stage of data collection.

3.3 Measures

The survey team collected five types of data: 1) Parenting styles of caregivers in G1; 2) Parenting styles of caregivers in G2; 3) Social-emotional problems and competencies of children in G3/G4; 4) Mental health condition of the caregiver in G2; and 5) socio-demographic characteristics.

3.3.1 Parenting Styles of G1

Parenting styles were assessed using the Egna Minnen Beträffande Uppfostran (EMBU; Perris et al., 1980), a well-validated self-report questionnaire that measures individuals' recollections of childhood parenting. The instrument contains 81 items evaluating three dimensions: Rejection, Emotional Warmth, and Overprotection. Responses are captured on a 4-point Likert scale ranging from "never" to "very often," where higher scores denote greater levels of the respective parenting behavior. Initially developed in Sweden, the EMBU has been extensively translated and validated in diverse cultural contexts, including China (Wang et al., 2015; Yue et al., 1993), supporting its use in cross-cultural family research.

Given time constraints, this study utilized a 23-item short form of the EMBU (s-EMBU), which has demonstrated cross-cultural applicability. The s-EMBU assesses three parenting dimensions for each parent: Emotional Warmth, Rejection, and Overprotection. The Rejection subscale captures both overt behaviors (e.g., criticism, punishment) and subtle forms (e.g., neglect). Emotional Warmth reflects expressions of

love, affection, and praise, while Overprotection indicates excessive parental involvement that may hinder child autonomy. Internal consistency, evaluated by Cronbach's alpha, ranged from 0.74 to 0.81 across subscales, indicating acceptable reliability for the sample size (Nunnally, 1978).

The overprotection dimension of the short-EMBU was assessed using nine items per parent. Example items include: "When I came home, I then had to account for what I had been doing to my parents," and "My parents wanted to decide how I should be dressed or how I should look." For analytical clarity, these items were conceptually grouped into three distinct categories reflecting different manifestations of overprotective parenting: 1) *Appropriate behavioral control due to safety consideration* (e.g., parental worry, requiring accountability); 2) *Excessive behavioral control* (e.g., guilt engendering, restricting freedom); and 3) *Psychological control* (e.g., interference in personal choices, decisive limits). This categorization facilitates a nuanced analysis of how specific overprotective behaviors influence child outcomes.

This category, *appropriate behavioral control due to safety considerations*, reflects a parenting approach where limits are set primarily to ensure the child's safety. This concept aligns with the authoritative parenting style, which balances warmth with clear, reasoned expectations. Studies have shown that providing such structured guidance helps children internalize behavioral standards and develop self-regulation abilities (Galambos et al., 2003; Lewis-Morrarty et al., 2012).

The category of *excessive behavioral control* encompasses parenting behaviors marked by intrusive management of a child's choices and activities, such as interfering with personal decisions or imposing rigid limits. This style aligns with authoritarian parenting, which prioritizes strict obedience and parental authority. Empirical studies have associated such excessive control with adverse developmental outcomes in children, including deviant behavior, misconduct, depression, and anxiety (Barnes & Farrell, 1992; Coie & Dodge, 1998).

The category of *psychological control* captures parenting behaviors characterized by emotional manipulation, such as inducing guilt or anxiety to influence the child's actions. This intrusive style involves tactics like exaggerated anxiety or demanding excessive accountability, which are intended to control the child psychologically. Grounded in theories of manipulative parenting, empirical evidence indicates that such psychological control is detrimental to children's emotional development and is associated with outcomes including depression, antisocial behavior, and relational difficulties (Barber & Harmon, 2002; Kuppens et al., 2013).

3.3.2 Parenting Styles of G2

The Parenting Practice Questionnaire (PPQ) is a cross-culturally validated self-report measure for caregivers (Robinson, Hart, & Mandleco, 1996), designed to assess current parenting behaviors across four subscales: Warmth, Consistency, Hostility, and

Rejection. Our analysis concentrated on the Warmth and Hostility subscales, selected for their conceptual correspondence to the "emotional warmth" and "rejection" dimensions measured by the EMBU.

The Warmth subscale (6 items) assesses caregivers' nurturing behaviors, including expressing warmth, providing encouragement, and supporting autonomy. In contrast, the Hostility subscale (6 items) assesses dismissive or punitive responses to misbehavior, such as scolding, threats, or physical punishment. Responses were recorded on a 5-point Likert scale ranging from 1 (never/hardly ever) to 5 (always). Subscale scores were computed as the mean of item responses, with higher scores reflecting a stronger tendency toward the respective parenting style.

Psychometric properties of the PPQ in our sample showed acceptable internal consistency, with Cronbach's alpha coefficients of 0.59-0.78 for the Warmth and Hostility subscales (Nunnally & Bernstein, 1978).

3.3.3 Social-emotional problems and competencies of G3/G4

The Brief Infant-Toddler Social and Emotional Assessment (BITSEA) is a norm-referenced instrument completed by primary caregivers to assess social-emotional problems and competencies in children under three years of age (Briggs-Gowan et al., 2004). Its brevity and ease of administration make it suitable for diverse settings, and it has demonstrated strong psychometric properties. Reliability and clinical validity have been established across studies involving both clinical and general population samples of toddlers (Karabekiroglu et al., 2010; Kruizinga et al., 2012).

The BITSEA is structured into two domains. The "Problems" section encompasses 31 items assessing a range of difficulties, including internalizing and externalizing behaviors, maladaptation, dysregulation, and atypical behaviors. In contrast, the "Competencies" section comprises 11 items that evaluate key social-emotional abilities, including compliance, mastery motivation, prosocial peer relations, empathy, attention maintenance, imitation/play skills, and social engagement.

During the assessment, caregivers rated each item verbally on a 3-point scale: 0 (Not true/Rarely), 1 (Somewhat true/Occasionally), and 2 (Very true/Often). A total score for each section is derived by summing the respective item scores. For interpretation, a higher total score on the "Problems" section indicates a greater level of social-emotional or behavioral difficulties. In contrast, a lower score on the "Competencies" section suggests possible delays or deficits in those abilities.

3.3.4 Mental health of primary caregiver (G2)

The Depression Anxiety Stress Scales (DASS) is a widely used self-report instrument assessing three negative emotional states: depression, anxiety, and stress. While the original version contains 42 items, a shortened 21-item form (DASS-21) was developed by Antony et al. (1998) to improve practicality. The DASS-21 has been validated in the Chinese context by Wang et al. (2015) and demonstrates good temporal sensitivity, making it a valuable tool for monitoring outcomes in psychological

interventions.

The primary caregivers, who served as respondents, were asked to rate the extent to which each statement applied to them over the preceding week. Responses were recorded on a 4-point Likert scale ranging from 0 ("Did not apply to me at all") to 3 ("Applied to me very much, or most of the time"). The total score for each subscale (Depression, Anxiety, Stress) was computed by summing the relevant items and multiplying the sum by 2, yielding a potential range of 0 to 42. Higher scores indicate more severe levels of the respective negative emotional state. In the current sample, the DASS-21 demonstrated excellent internal consistency, with Cronbach's alpha coefficients exceeding 0.90 for all subscales.

3.3.5 Confounding factors

We collected data on three categories of variables that could confound the relationship between the parenting styles of G1 and the social-emotional development of G3/G4: (1) child characteristics: gender (boy/girl), age in months (mean ± SD), low birth weight (yes/no); (2) caregiver characteristics: age, education attainment (0=illiterate; 1=primary school; 2=junior high school; 3=senior high school; 4=colleague for professional training; 5=undergraduate school or above); (3) household characteristics: the number of siblings (biological sisters or brothers), family income (greater than 25,000 yuan/at most 25,000 yuan). This study defines low birth weight as less than 2500 grams. We further control these confounding variables in the multivariate linear regression to improve estimation precision.

3.4 Data analysis

Our analysis commenced with descriptive statistics, presenting means and standard deviations for continuous variables and frequencies (percentages) for categorical variables. We then conducted bivariate correlation analyses to examine the relationships among the key variables: the predictor (G1 parenting styles), the outcomes (G3/G4 social-emotional problems and competencies), the mediator (G2 mental health), and the moderator (G2 educational attainment). Descriptive analyses were performed using Stata 15.1 (StataCorp LLC, Texas, USA), while the path model testing for moderated mediation was estimated using Mplus 8 (Muthén & Muthén, 2017).

Furthermore, we tested the moderated mediation hypothesis by including an interaction term between G1's parenting styles and G2's mental health in the model. Prior to analysis, all continuous variables were mean-centered to mitigate multicollinearity (Aiken & West, 1991). The significance of the moderated mediation effect was evaluated using the product-of-coefficients approach (Edwards & Lambert, 2007), which tests whether the path from the interaction term to the mediator is significant.

3. Empirical analysis

4.1 Descriptive statistics and correlations

Table 1 presents the characteristics of the study sample. The Problem and

Competence subscales for G3/G4 have possible total scores of 31 and 11, respectively, with higher Problem scores and lower Competence scores indicating greater difficulties and fewer strengths. In our sample, the mean scores were 6.76 for social-emotional problems and 4.01 for competence, indicating lower levels of observed competencies than the potential range. Regarding parenting styles, mothers reported slightly higher scores than fathers across all dimensions. The mean score for caregivers' mental health problems was 13.2 (SD = 9.85). This level is notably higher than that reported in a broader sample of caregivers from an underdeveloped rural region in Western China (Zhong et al., 2021), suggesting significant mental health concerns among the primary caregivers in our study.

Pearson correlation analyses were conducted to examine bivariate relationships among the key variables (Appendix Table A1). The results revealed several key patterns. First, G1's parenting styles were associated with G3/G4's social-emotional outcomes: rejecting parenting by both fathers and mothers, as well as maternal overprotective parenting, were positively correlated with higher levels of problems in G3/G4; however, paternal overprotection showed no significant association. Second, G1's parenting was also related to G2's mental health: warm parenting from fathers was negatively correlated with G2's mental health issues, whereas rejecting and overprotective parenting from both parents was positively correlated. Finally, supporting the proposed mediating pathway, G2's poorer mental health was significantly positively correlated with more social-emotional problems in G3/G4.

4.2 Testing the overall model and mediation effects

The three-generation model (Fig. 2, Panel A) revealed several significant pathways with distinct patterns. First, G1 parenting styles directly predicted G2's warm parenting: G1 mothers' warmth was positively associated with G2's warmth ($\beta = 0.389$, $p < 0.05$), whereas G1 fathers' rejection negatively predicted it ($\beta = -0.421$, $p < 0.05$). Interestingly, G1 mothers' rejection showed a marginal positive association ($\beta = 0.33$, $p < 0.1$). Furthermore, G2's hostile parenting was negatively associated with G3's social-emotional competencies ($\beta = -0.176$, $p < 0.05$). In contrast, G2's warm parenting did not show a direct significant association with G3's outcomes in this model.

The four-generation model (Fig. 2, Panel B) elucidated distinct mediating pathways through which G1 parenting influences G4 outcomes via G2. Specifically, G1 fathers' rejection was negatively associated with G2's mental health problems ($\beta = -0.78$, $p < .05$), whereas G1 mothers' overprotection was a positive predictor ($\beta = 0.861$, $p < .05$). The effect of G1 parenting was then transmitted to G4, as G2's mental health problems were positively linked to G4's social-emotional problems ($\beta = 0.43$, $p < .01$). Furthermore, G2's warm parenting manifested a dual association with G4's development, correlating positively with both social-emotional problems ($\beta = 0.225$, $p < .01$) and competencies ($\beta = 0.224$, $p < .01$). To deconstruct these pathways, G1's overprotection was categorized into three subtypes (Appendix Figs. A1–A2). Analyses revealed that G1 fathers primarily employed safety-oriented appropriate control, while G1 mothers more frequently used excessive behavioral and psychological control.

4.3 Testing the moderated mediation effects

We further examined whether the educational attainment of G2 moderated the relationships between the overprotective parenting styles of G1 and the mental health condition of G2. The results, as presented in Table 2, show that the education of G2 has a significant indirect effect on the relationship between the overprotective parenting styles of G1 father and mother and the mental health condition of G2 in the four-generation model ($\beta = 0.537$, $p = 0.047$; $\beta = 0.537$, $p = 0.047$, respectively). This finding suggests that the positive effects of the protective parenting style of the G1 father on the mental health of G2 diminished as G2's education level decreased, while the adverse effects of the protective parenting style of the G1 mother on G2's mental health increased as G2's education level decreased.

4. **Discussion**

This study advances understanding of intergenerational parenting transmission and its impacts on early social-emotional development in rural Chinese families, leveraging unique survey data from Jiangxi Province to examine how family structure—three-generation versus four-generation—shapes the underlying mechanisms of transmission. A core insight emerges: the influence of G1 on G4 operates exclusively through G2, with G2's mediating role and gendered caregiving norms dictating both the strength and direction of these effects. This finding extends prior intergenerational research, which has primarily focused on direct parent-child dyads, by highlighting the indirect, cascading pathways through which earlier generations shape later developmental outcomes in extended-family contexts.

The structural model identifies two pivotal pathways in three-generation households, each grounded in theoretical frameworks and aligned with contextual rural Chinese norms. First, multiple dimensions of G1 parenting exert direct, gender-differentiated effects on G2's warm parenting, suggesting that children internalize caregiving scripts through observing and imitating primary caregivers. Specifically, G1 mothers' warm parenting shows a strong positive association with G2's warm parenting, a pattern also observed in Wang et al. (2024), who documented maternal warmth as the most robustly transmitted parenting dimension in rural China. In turn, G2 replicates these warm behaviors with G3, prioritizing responses to G3's emotional needs — such as comforting after peer conflict or praising prosocial acts — that support the development of emotion regulation and social competence. By contrast, G1 fathers' rejective parenting negatively predicts G2's warm parenting, aligning with Xu & Kogan (2013), who observed that rural Chinese fathers are socialized to prioritize "authoritative control" over nurturance; this socialization leads G2 to internalize an association between paternal behavior and low warmth, reducing their own warm interactions with G3. Notably, G1 mothers' rejective parenting positively predicts G2's warm parenting, reflecting a "compensatory warmth" mechanism.

Second, G2's hostile parenting undermines G3's social-emotional competencies. Wang et al. (2024) showed that authoritarian parenting style, a construct encompassing hostile behaviors such as verbal hostility, physical coercion, and non-reasoning

punishment, is significantly and positively associated with children's social-emotional difficulties, while being negatively associated with prosocial behaviors. Notably, G2's warm parenting did not directly predict G3's social-emotional outcomes in this model, suggesting two plausible explanations: either unmeasured factors (e.g., G3's temperament or community support) moderate this link, or hostile parenting exerts a more potent immediate effect on social-emotional development, overshadowing the protective role of warmth in the cross-sectional design.

In four-generation households, G3's migration for urban employment reshapes caregiving dynamics: G2 (G3's mothers, mean age = 51.1 years) becomes G4's primary caregiver, while G1 (mean age = 72 years) has minimal direct contact with G4. Here, G1's influence on G4 operates through pathways involving G2's mental health and parenting behaviors, reflecting a "distant generational transmission" driven by rural-urban migration and age-related caregiving reconfigurations, a pattern rarely examined in prior intergenerational research.

From the structural model, G1's parenting styles exert distinct effects on G2's mental health, consistent with gendered caregiving norms in pre-reform rural China. G1 fathers' rejective parenting was negatively associated with G2's mental health problems, whereas G1 mothers' overprotection positively predicted G2's psychological distress. This pattern echoes Faleschini et al. (2020), who linked maternal overprotection, characterized by psychological control, to higher levels of hyperactivity-impulsivity symptoms across childhood. G1 mothers, as primary caregivers during eras of resource scarcity, relied on psychological control to manage G2's behavior; this pattern is internalized by G2 as emotional constraint, manifesting as depression or anxiety in adulthood. By contrast, G1 fathers' rejection was interpreted by G2 as "authoritative detachment" rather than harshness, reducing psychological distress.

Subsequently, G2's mental health and warm parenting directly shape G4's social-emotional outcomes. G2's mental health problems positively predicted G4's social-emotional difficulties, consistent with Zhong et al. (2021), who showed that a 1-standard deviation increase in caregiver mental health issues correlates with a 5% standard deviation rise in rural children's social-emotional problems. For example, a depressed G2 may emotionally withdraw from G4 or overreact to minor misbehaviors, disrupting the secure attachment and consistent emotional responsiveness needed for G4's emotion regulation.

Meanwhile, G2's warm parenting exerts a dual influence on G4's social-emotional outcomes, shaped by attachment and self-determination theories and amplified by the sociocultural context of rural Chinese intergenerational care. On the positive side, G2's warmth fosters a secure attachment base with G4, reducing internalizing and externalizing problems while promoting prosocial behaviors (Luo et al., 2020; Stephenson & Carstensen, 2025). On the negative side, this warmth often coexists with behavioral restrictions and psychological control, which limit G4's opportunities for autonomous social exploration and undermine their sense of autonomy (Gao et al.,

2022). This dual effect is particularly pronounced in rural China, where G2 faces contextual pressures that exacerbate the tension between warmth and control. Ultimately, the impact of G2's warm parenting depends on the balance between nurturing emotional security and avoiding excessive restrictions, highlighting the need for targeted interventions to optimize its protective benefits.

Our findings further confirm that G2's educational attainment moderates the association between G1's overprotection and G2's mental health, with more potent effects observed among G2 with lower education. This aligns with self-determination theory (Deci & Ryan, 2008), which argues that external factors (e.g., G1's overprotection) shape well-being by influencing autonomy and competence. G1's excessive control may undermine G2's sense of autonomy. However, higher education provides G2 with cognitive resources (e.g., emotion regulation skills, critical thinking) to reframe G1's overprotection (e.g., viewing safety rules as caring rather than restrictive) or seek social support to mitigate distress (Yao et al., 2022). In contrast, lower education reduces these buffering resources, amplifying the harmful effects of G1 mothers' psychological control and weakening the protective effects of G1 fathers' safety-focused care.

This study extends the intergenerational parenting research in three key ways. First, unlike previous research on direct transmission of parenting behaviors to second-generation children's behavioral development, our findings suggest broader, far-reaching effects of parenting behaviors. Notably, even family members without direct contact can predict early childhood development. Second, the gender division of parenting roles, often overlooked in intergenerational studies, is explored, recognizing its significance for understanding long-term effects. Fathers are typically seen as helpers to mothers, with little responsibility for their children's care and rearing (Yeung, 2013). On average, mothers spend more time than fathers engaging in direct interactions with their young children, and most researchers agree that mothers usually play a more central role than fathers in children's development (Bornstein, 2001). In China's dynamic sociocultural changes post-reform and opening, variations in gender divisions over time are crucial when studying parenting styles. Our results indicate that G1 parents' styles, encompassing both fathers and mothers, correlate with their children's mental health outcomes, emphasizing the pivotal role of fathers as primary caregivers. This study paves the way for future research into the enduring effects of male caregivers' parenting styles. (Yeung, 2013; Bornstein, 2001)

The findings of this study, coupled with prior research, carry substantial implications for preventive interventions aimed at disrupting or preventing detrimental cycles in parenting. Firstly, our results underscore the enduring impact of parenting styles through generations, advocating for parent-training interventions. Such interventions, which provide evidence-based guidance on effective child-rearing practices, hold promise for preventing the exacerbation of children's social-emotional problems and should be extended to all caregivers. Secondly, acknowledging that a parent's present mental health is influenced by their upbringing, therapeutic interventions should focus on addressing negative perceptions of past parenting

experiences. Encouraging positive reinterpretations may enhance parents' mental health outcomes and, consequently, improve parenting practices for the benefit of their children. Thirdly, fostering a balanced division of parenting roles within families, with fathers and mothers acquiring distinct parenting skills, is imperative. Lastly, an emphasis on mental health-related education within the existing educational system is crucial. Targeted support systems, attuned to diverse mental health needs in educational settings, can contribute to positive mental health outcomes across generations.

Despite its contributions, this study has several limitations that should be considered. First, the cross-sectional nature of the data used in this study precludes us from making causal inferences from our findings. Second, while evidence supports the reliability of the instrument used to assess G1's parenting styles, it is retrospective and, therefore, vulnerable to recall bias (Arrindell et al., 1986; Arrindell et al., 1999). Moreover, G2's self-reported perceptions of G1's parenting styles may not accurately reflect the actual ones. Longitudinal studies that follow children over time are essential to confirm actual intergenerational effects. In future research, multiple measures from multiple informants should be used to verify these speculations. Third, this study did not consider genetic factors due to ethical and time constraints. As a result, shared genetic predispositions among G1, G2, and G3/G4 may contribute to some of the intergenerational connections. Fourth, since our sample was drawn from a single rural location in southeastern China, it is impossible to generalize our findings to other contexts. Future research should conduct cross-regional analyses to assess the generalizability of our findings to other regions with different cultural backgrounds.

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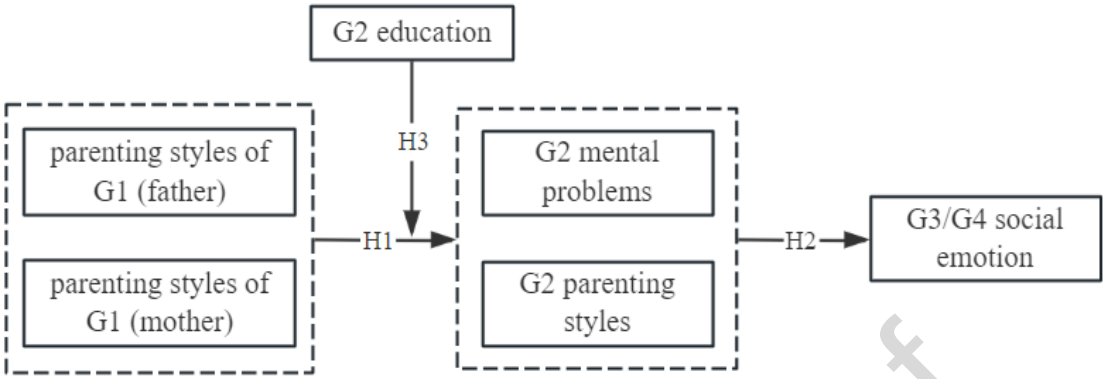
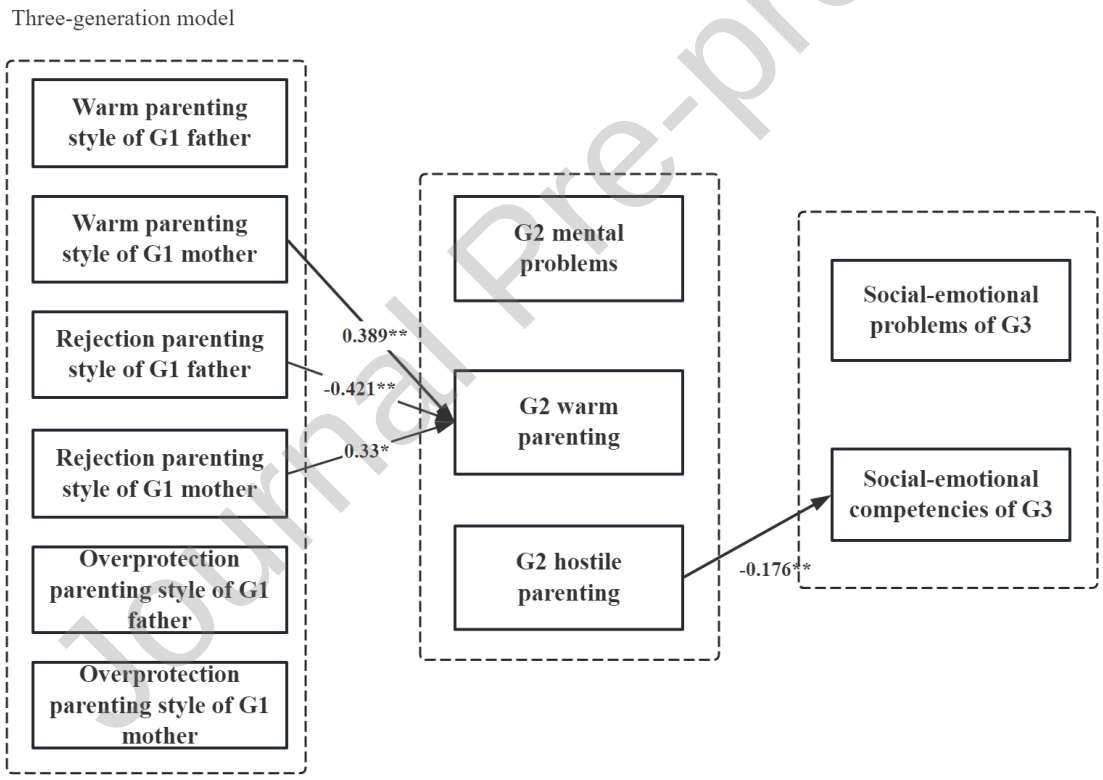
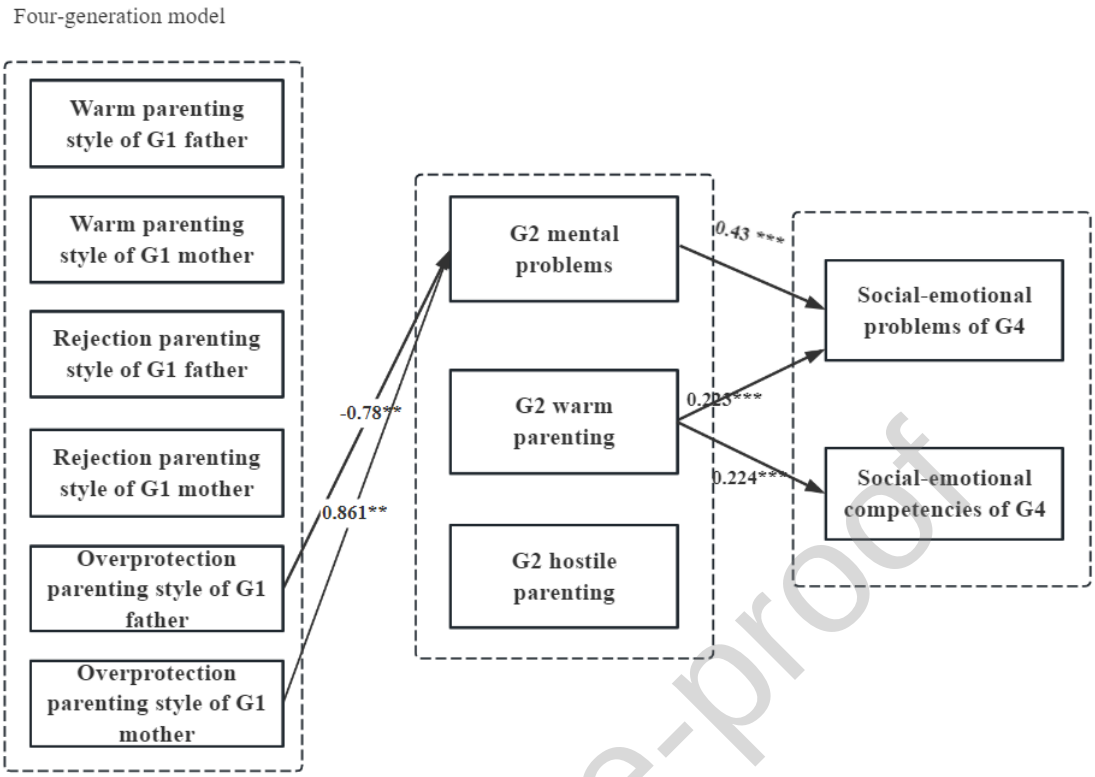


Fig. 1. Conceptual framework and hypotheses of the model



(Panel A)



(Panel B)

Fig. 2. Structural model for the relationship between parenting styles of G1, mental health problems, and parenting styles of G2, and social-emotional development of G3/G4. Goodness of fit: RMSEA= 0.00, CFI = 1.00 and TLI = 1.00. The model simultaneously includes G1 fathers' and mothers' parenting styles (warmth, overprotection, rejection), G2 caregivers' mental health, G2 parenting styles, and G3/G4 socioemotional outcomes. Standardized path coefficients are presented; non-significant paths are omitted to reduce complexity.

Table 1 Descriptive statistics

Variable	Definition	Mean ± S.D/ No. (%)
Dependent variable		
G3/G4_problem	Score of children's social-emotional problems	6.76 ± 4.04
G3/G4_competencies	Score of children's social-emotional competencies	4.01 ± 2.1
Independent variable		
G1_warm_dad	Perceived warm experience with dad	11.95 ± 3.4
G1_warm_mom	Perceived warm experience with mom	12.39 ± 3.26
G1_reject_dad	Perceived rejective experience with dad	10.06 ± 3.36
G1_reject_mom	Perceived rejective experience with mom	10.19 ± 3.06
G1_protect_dad	Perceived overprotective experience with dad	16.72 ± 3.65
G1_protect_mom	Perceived overprotective experience with mom	17.17 ± 3.7

Mediator variable		
G2_DASS	Total score of mental health problems	13.2 ± 9.85
Moderator variable		
G3/G4_Gender	Children's gender	
Boy		99 (51.03)
Girl		95 (48.97)
Covariates		
G3/G4_Age in month	Children's age in months	11.32 ± 4.72
G3/G4_Siblings	Number of siblings at home	0.49 ± 0.73
G3/G4_Low birthweight	Born with low birthweight	
yes		150 (77.32)
no		44 (22.68)
G2_age	Caregiver's age	38.38 ± 12.61
G2_edu	G2's educational attainment (0=illiterate; 1=primary school; 2=junior high school; 3=senior high school; 4=colleague for professional training; 5=undergraduate school or above)	3.21 ± 1.1
Family income	Family income per year	
>25000		153 (78.87)
⩽25000		41 (21.13)

Table 2 Indirect effects, moderated mediation effects, and total effects in three- and four-generation models

Panel A: three-generation model	G1_protect_dad → G2_DASS → G3_problem			G1_protect_dad → G2_DASS → G3_competencies			G1_protect_mom → G2_DASS → G3_problem			G1_protect_mom → G2_DASS → G3_competencies		
	b	SE	p-value	b	SE	p-value	b	SE	p-value	b	SE	p-value
IND_LW	-0.091	0.148	0.539	0.033	0.059	0.571	0.13	0.139	0.351	-0.048	0.065	0.463
IND_MW	-0.028	0.067	0.676	0.01	0.026	0.687	0.063	0.063	0.323	-0.023	0.031	0.462
IND_HW	0.034	0.052	0.507	-0.013	0.018	0.49	-0.005	0.047	0.915	0.002	0.016	0.910
IMM	0.057	0.079	0.476	-0.021	0.032	0.514	0.057	0.079	0.476	-0.021	0.032	0.514
TOT_LW	-0.245	0.271	0.365	-0.222	0.123	0.071	0.298	0.252	0.238	0.169	0.116	0.146
TOT_MW	-0.183	0.232	0.432	-0.245	0.110	0.026	0.231	0.213	0.278	0.194	0.103	0.059
TOT_HW	-0.12	0.224	0.590	-0.268	0.108	0.013	0.163	0.201	0.416	0.219	0.101	0.030
Panel B: four-generation model	G1_protect_dad → G2_DASS → G4_problem			G1_protect_dad → G2_DASS → G4_competencies			G1_protect_mom → G2_DASS → G4_problem			G1_protect_mom → G2_DASS → G4_competencies		
	b	SE	p-value	b	SE	p-	b	SE	p-	b	SE	p-value

						value					value
IND_LW	-0.897	0.361	0.013	-0.068	0.199	0.731	0.891	0.375	0.017	0.068	0.199	0.734
IND_MW	-0.304	0.174	0.081	-0.023	0.071	0.746	0.258	0.159	0.086	0.02	0.062	0.752
IND_HW	0.29	0.33	0.379	0.022	0.101	0.827	-0.375	0.328	0.253	-0.029	0.111	0.798
IMM	0.537	0.271	0.047	0.041	0.127	0.748	0.537	0.271	0.047	0.041	0.127	0.748
TOT_LW	-1.299	0.327	0.000	0.005	0.184	0.976	1.409	0.326	0.000	0.121	0.175	0.489
TOT_MW	-0.706	0.261	0.007	0.051	0.153	0.741	0.776	0.221	0.000	0.073	0.132	0.580
TOT_HW	-0.112	0.456	0.805	0.096	0.229	0.676	0.143	0.434	0.743	0.025	0.221	0.910

Note: (i) IND_LW=indirect effect of low level of G2 education; IND_MW=indirect effect of the middle level of G2 education; IND_HW=indirect effect of the high level of G2 education; IMM=index of moderated mediation; TOT_LW=total effect of low level of G2 education; TOT _MW= total effect of the middle level of G2 education; TOT _HW= total effect of high level of G2 education. (ii) Covariates included in Table 1 were included in the regression.

Declaration of Competing Interest

The authors declare that they have no known competing interests or personal relationships that could have appeared to influence the work reported in this paper.