Current Psychology (2024) 43:5254–5267
https://doi.org/10.1007/s12144-023-04656-4

# Chinese parental involvement, parenting self-efficacy, and children's school readiness: analysis using the actor-partner interdependence mediation model

**Qianqian Liu**[1] · **Xiaowei Li**[1]

Accepted: 7 April 2023 / Published online: 9 May 2023


**Abstract**
The Actor-Partner Interdependence Mediation Model was employed to examine the relationships among parental involvement, parenting self-efficacy, and children's school readiness. A total of 438 Chinese couples and their young children were recruited to participate in a two-wave longitudinal study over a 10-month period. The results indicated that the predictive effects of maternal involvement and paternal involvement on children's school readiness were not significant. However, parenting self-efficacy played an indirect role between parental involvement and children's school readiness. Specifically, maternal involvement positively affected children's school readiness via an indirect association with maternal and paternal parenting self-efficacy. The positive impact of paternal involvement on children's school readiness only occurred indirectly through their own parenting self-efficacy. The results revealed differences and interdependence of mothers and fathers in the parenting process. Our findings also highlighted several potential avenues for interventions for promoting school readiness among young children, including interventions focused on parental involvement and parenting self-efficacy.

**Keywords** Parental involvement · Parenting self-efficacy · Children's school readiness · Actor–Partner Interdependence Mediation Model

Early school readiness has become an important issue for research and policy in many countries in recent years, including China. Substantial evidence exists regarding the importance of children's school readiness for later academic achievement (Curran et al., 2020; Hoffman et al., 2020; Romano et al., 2010). Children who are well prepared for school are typically able to make a smooth transition from kindergarten to primary school, adapt quickly to learning at primary school, and are more likely to achieve success at school and in the future (Hair et al., 2006; Snow, 2006). However, if children are at risk regarding school readiness, early gaps can widen and extend throughout their school career.

Determining the optimal approach for promoting children's school readiness has received extensive attention. One promising avenue for improving children's educational prospects is the parenting process, because parental involvement and parenting self-efficacy have been linked to stronger positive outcomes for children. Numerous studies have documented the prominent role of parental involvement and parenting self-efficacy in children's academic skills, social competence and behavior performance (Holloway et al., 2016; Kung & Lee, 2016; Rouse & Fantuzzo, 2009). However, this body of previous research has several shortcomings. Although some previous research has explored the effects of parental involvement and parenting self-efficacy on child development, many of these studies have focused on one aspect of the developmental outcomes rather than comprehensive child development outcomes, such as school readiness. In addition, researchers have typically examined the role of mothers, with few studies focusing on both mothers and fathers. Moreover, most previous studies have used cross-sectional designs, with only a few focusing on

✉ Xiaowei Li
bnulixw@126.com.com

Qianqian Liu
qianqianliubnu@163.com

[1] Faculty of Education, Beijing Normal University, Beijing 100875, China

potential mechanisms exploring how parental involvement influences children's school readiness longitudinally.

To address these gaps, the current study examined the relationship between maternal and paternal involvement and children's school readiness as well as the mediating roles of maternal and paternal parenting self-efficacy in such relations among a longitudinal sample of the Chinese population. We used data obtained from 483 Chinese families including mothers, fathers, and a young child, because fathers have not received as much attention as mothers in previous studies, despite their important role in the parenting process. Notably, dyadic data can be helpful for examining the intrapersonal and interpersonal associations between parental involvement and parenting self-efficacy. The Actor-Partner Interdependence Mediation Model (APIMeM; Ledermann et al., 2011) provides a theoretical foundation to understand mediating effects in a dyadic context, for example, of mother and father. This allows examination of the effect of individuals' own characteristics on their own outcomes, as well as the mutual influences between individuals in a dyad. Thus, this model was employed in the current study. In addition, we used a 10-month longitudinal design to examine the relationships among parental involvement, parenting self-efficacy, and children's school readiness, which contribute to understanding the predictive effects of the parenting process on children's multifaceted development.

## Parental involvement and children's school readiness

School readiness can be defined broadly as an outcome of a child's early years, including a set of skills and competencies that help children learn and succeed in primary school (Ansari et al., 2021; Graue, 2006; Snow, 2006). A large body of research suggests that children's school success is predicted by school readiness, such as their basic knowledge about letters and numbers, their ability to interact with peers and adults, and their ability to control impulses and focus attention (Duncan et al., 2018; Grissmer et al., 2010; Romano et al., 2010). Although researchers have used different definitions of school readiness, there is consensus that school readiness is multifaceted and not only includes early academic skills but also language development, social competence, and emotion development (National Education Goals Panel, 1995). On the basis of existing research (Lohndorf et al., 2021), we define school readiness as a multidimensional phenomenon involving cognitive development, language development, mathematics skill, and social competencies.

Researchers have long been interested in the potential effects of parental involvement on children's developmental outcomes (Boonk et al., 2018; Fan & Chen, 2001). Parental involvement refers to the proactive engagement of parents in various activities and behaviors that aim to promote their children's development. Despite the widespread belief that parental involvement is closely related to children's development, there are mixed findings regarding the effects of parental involvement on children's academic achievement and school readiness. A number of studies suggest that parental involvement is a critical component of children's positive development (Dove et al., 2015; Fan, 2001; Schulting et al., 2005). Parents' active involvement in children's education is thought to promote children's positive developmental outcomes, including cognitive skills, social skills, and academic success (Green et al., 2007; Hill & Tyson, 2009; Silinskas & Kikas, 2019). However, some studies have reported that parental involvement is not associated with changes in students' academic achievement (Hindman et al., 2010). Moreover, other studies have reported that parental involvement is negatively associated with children's achievement (Graves et al., 2011; Hill et al., 2004; Sibley & Dearing, 2014; Wen et al., 2012).

## Relationships among parental involvement, parenting self-efficacy and children's school readiness

Similar to parental involvement, parenting self-efficacy has been found to be a key factor influencing children's development. Parenting self-efficacy can be defined as a parent's beliefs about their own competence to parent and raise their child successfully (Coleman & Karraker, 1998). The relationship between parenting self-efficacy and children's development has been well documented. For instance, parenting self-efficacy was found to be positively associated with children's developmental status and behavior (Coleman & Karraker, 2000, 2003). Furthermore, longitudinal data support the role of parenting self-efficacy in promoting child development. A study conducted by Weavera and colleagues (2008) found that maternal parenting self-efficacy predicted children's behavior problems 2 years later.

As mentioned above, parental involvement and parenting self-efficacy have been associated with children's development. Despite such significant associations, these effects may have more complex and indirect relationships, such as mediation processes. That is, parental involvement may influence children's development through its association with parenting self-efficacy. This notion has been partially supported by previous studies. According to self-efficacy theory, positive parenting practices are an important factor in improving parenting self-efficacy (Bandura, 1986, 1997).

If parents evaluate more positive child behavior as an indicator of mastery or success, promotive parenting practices could predict parenting self-efficacy because the most effective way of increasing a person's sense of self-efficacy is through mastery experiences (Coleman & Karraker, 2000, 2003). In addition, empirical studies have shown that parental involvement is a positive predictor of parental efficacy (Chung et al., 2014; Glatz & Buchanan, 2015; Slagt et al., 2012). Furthermore, some studies have examined the mediating role of parenting self-efficacy between parenting practices and child development. For example, Coleman and colleagues (2002) reported that parenting self-efficacy plays a potential mediating role in the effects of parenting behavior on toddlers' development. A study by Sagui-Henson et al. (2020) reported that parental emotion regulation ability regarding their children's health situation influenced child dietary habits through the indirect effect of parenting self-efficacy. However, studies examining the indirect effects of parenting self-efficacy between parental involvement and children's school readiness are limited.

In addition, although the influence of parental involvement and parenting self-efficacy on child development has received extensive attention, existing studies are still mainly cross-sectional (Susan et al., 2016; Xia et al., 2019). Although cross-sectional studies can explain the relationships between variables, they have limitations in examining their predictive power (Maxwell & Cole, 2007). Therefore, it is necessary to investigate the impact of parental involvement parenting self-efficacy and on children's development used a longitudinal design.

## Differences and interdependence between mothers and fathers

Although earlier studies demonstrated the impact of parental involvement and parenting self-efficacy on children's positive developmental outcomes, few studies have examined how maternal and paternal involvement and parenting self-efficacy affect children's school readiness. Research on parental involvement and parenting self-efficacy has largely neglected fathers, despite the growing acknowledgment that fathers play a vital role in child development (Jones & Prinz, 2005; Lamb & Lewis, 2004). For example, Lohndorf et al. (2021) focused only on the predictive role of the maternal supportive discipline in school readiness. Furthermore, although Castro-Schilo et al. (2013) examined both mothers' and fathers' optimism, they ignored the differences between maternal involvement and paternal involvement and combined positive parenting of the mother and father.

However, some empirical studies have distinguished between mothers and fathers in family parenting research. Mothers have been reported to take more responsibility for child-related tasks than fathers, and to be more intensely involved in parenting (Cerniglia et al., 2014; Flouri & Buchanan, 2004). Moreover, the effect of maternal and paternal involvement had different impacts on children's outcomes in both young children and adolescents (Day & Padillawalker, 2009; Dubeau et al., 2013). For example, on the basis of data from 430 American families, Duursma (2014) found that maternal book-reading was a significant predictor of child cognitive skills only, whereas paternal book-reading significantly predicted children's language and cognitive skills, as well as their knowledge of books. The above study suggests the importance of investigating maternal and paternal involvement and maternal and paternal parenting self-efficacy, respectively, which could further elucidate the effects of different caregivers' parenting behaviors and self-efficacy on child development.

In addition, according to Kenny (1996), a mother and father from the same family are not independent, and research models should consider the family unit and the dynamic interdependent relationship between the mother and father. In other words, there is an interdependent relationship among maternal involvement, maternal parenting self-efficacy, paternal involvement and paternal parenting self-efficacy. Coincidentally, the spillover hypothesis and crossover hypotheses stemming from family systems theory also suggest that the father's and mother's emotional and behavioral states influence each other. Specifically, the spillover hypothesis proposes that an individual's mood and behavior can be transferred from one family member to another (Zemp et al., 2018), thereby representing the intrapersonal spillover effect of affect and behavior. In addition, the crossover hypothesis proposes that an individual's affect and behavior can be transferred to another family member (Newland et al., 2015), thereby representing the interpersonal transfer of affect and behavior (i.e., crossover effect).

Motived by this notion, the Actor-Partner Interdependence Model (APIM) was used to examine both intrapersonal and interpersonal associations (Cook & Kenny, 2005; Kenny & Ledermann, 2010). This model allows researchers to study the impact of a person's causal variable on his or her own outcome variable (actor effect) and on the outcome variable of the partner (partner effect). The actor effect estimated the effect of an individual's mood and behavior on their own mood and behavior. Thus, paternal involvement can be associated with paternal parenting self-efficacy, whereas maternal involvement can be associated with maternal parenting self-efficacy. The partner effect estimated the effect of an individual's affect and behavior on their partner's affect and behavior. Thus, paternal involvement can be associated with maternal parenting self-efficacy, and maternal involvement can be associated with paternal parenting self-efficacy. Extending this standard APIM by a

third variable pair could get the APIMeM (Ledermann et al., 2011). That is, after incorporating children's school readiness as an outcome variable into the APIM between parental involvement and parental self-efficacy, a APIMeM including parental involvement, parental efficacy and children's school readiness was formed. On the basis of the models described above, the current study sought to examine the dynamic interdependent relationship in the mediating model of parental involvement, parenting self-efficacy, and children's school readiness.

### The present study

The present study employed the APIMeM, which was developed to handle dyadic relationships for investigating the association among parental involvement, parenting self-efficacy, and children's school readiness. In addition, the longitudinal design can examine the predictive effect of independent variables on outcome variables. Thus, 10 months of longitudinal data were employed to examine the predictive effects of parental involvement and parenting self-efficacy on children's school readiness. Specifically, we investigated how maternal and paternal involvement (Time 1) affect children's school readiness (Time 2), as well as examining the indirect effects of maternal and paternal parenting self-efficacy (Time 1) among them. Guided by previous studies and the APIMeM (Ledermann et al., 2011; Coleman et al., 2002), we hypothesized: (1) Maternal and paternal involvement would positively predict children's school readiness; (2) Maternal and paternal involvement would be positively related to their own and their spouse's parenting self-efficacy and would thus ultimately positively affect children's school readiness.

## Methods

### Participants

A total of 483 families, including fathers, mothers, and their young children participated in the present study. Among the children, there were 237 boys and 246 girls with an average age of 4.55 years old ($SD = 0.77$), 76.00% of whom were the only child in their families. The mean age of mothers was 33.56 years old ($SD = 4.01$). The level of education of mothers was as follows: 3.7% were middle school graduates, 32.5% were high school graduates, and 63.8% had college education or above. The mean age of fathers was 35.41 years old ($SD = 5.04$). The level of education of fathers was as follows: 8.0% were middle school graduates, 41.2% were high school graduates, and 49.2% had college education or above. The average monthly income of 75.3% of families was more than RMB 5,000. According to the data of the National Statistical Bureau of the People's Republic of China (2020), the families were classified as middle-income.

Ten months later, we conducted a follow-up study of 438 families (response rate was 90.7%). There were 212 boys and 226 girls with an average of 5.30 years old ($SD = 0.83$), 74.1% of whom were the only child in their families. The mean age of mothers was 34.03 years old ($SD = 4.19$). The level of education of mothers was as follows: 4.7% were middle school graduates, 35.4% were high school graduates, and 64.6% had college education or above. The mean age of fathers was 35.71 years old ($SD = 5.14$). The level of education of fathers was as follows: 7.0% were middle school graduates, 35.2% were high school graduates, and 57.8% had college education or above.

### Measures

#### Parental involvement (time 1)

Parental involvement was assessed using the Chinese version of the Family Involvement Questionnaire-Short Form (Liu & Li, 2019). The Family Involvement Questionnaire-Short Form was developed by Fantuzzo et al. (2013) and consists of three dimensions: home-school conferencing (e.g. "I attend conferences with the teacher to talk about my child's learning or behavior," seven items), school-based involvement (e.g., "I talk with other parents about school meetings and events," seven items), and home-based involvement (e.g. "I spend time with my child working on number skills," seven items). Parents responded to the items on a four-point Likert scale ranging from (1) *never* to (5) *always*. The original questionnaire consists of 21 items, which were revised into 20 items in China (Liu & Li, 2019). The item "I volunteer in my child's classroom" with a factor load below 0.4 was deleted because parents in mainland China seldom work as teaching assistants in kindergartens, and kindergartens seldom provide parents with this opportunity. The Chinese version of the Family Involvement Questionnaire-Short Form showed good reliability and validity. In this study, the Cronbach's α values of the three dimensions were 0.84, 0.88, and 0.92 in mothers' reports, and 0.84, 0.88, and 0.92 in fathers' reports, respectively.

#### Parenting self-efficacy (time 1)

Mothers and fathers rated parenting self-efficacy using the Parenting Self-Efficacy Scale (Suzuki et al., 2009). The Parenting Self-Efficacy Scale is a 25-item self-report instrument using a six-point scale with items rated from 1 (*not confident*) to 6 (*very confident*). The scale consists of two subscales: the maternal strategies efficacy subscale (e.g.,

"listen to your child," 10 items) and the child outcomes efficacy subscale (e.g., "teach your child to respect adults," 15 items). This scale has previously been tested in a Chinese sample, and was reported to have good reliability and validity (Li & Wei, 2017). In the current study, Cronbach's α values of the two dimensions were 0.89 and 0.94 in mothers' reports and 0.84, and 0.92 in fathers' reports, respectively.

#### Children's school readiness (time 1 and time 2)

**Language and cognitive development** The language and cognitive development subscale from the Early Development Instrument (EDI; Janus & Offord, 2007) was used to assess children's language and cognitive development. This subscale is made up of 26 items scored as 0 or 10 (for binary items). A sample item is "is able to write simple words." The language and cognitive development subscale is reported to have good reliability and validity in Chinese children (Liu & Li, 2019). In the current study, the Cronbach's α values were 0.96 at Time 1 and 0.94 at Time 2.

**Mathematics ability** Children's mathematics ability was assessed using the Child Individual Mathematics Test (Pan et al., 2006). The Child Individual Mathematics Test was developed to test Chinese children's math ability and has demonstrated good psychometric properties. This test consists of three counting questions and five arithmetic questions. In the first three counting questions, the child was asked to count the number of apples on three trees containing five, ten, and twenty apples, respectively. Of the five arithmetic questions, two were presented in a story about a picnic and three were demonstrated using a red ribbon. To answer these five questions correctly, children had to use addition.

**Social competence** The social competence subscale from the EDI (Janus & Offord, 2007) was used to assess children's social competence. This subscale is made up of 26 items (e.g., "is able to play with various children") and scored as 0, 5, or 10 (for three-category items). The social competence subscale has been previously revised and used in China with good reliability and validity (Liu & Li, 2019). In this study, the Cronbach's α values were 0.96 at Time 1 and 0.95 at Time 2.

### Control variables

Children's age and gender, parents' educational levels, and family income at Time 1, which have been found to be associated with children's school readiness indicators, were selected as control variables (Guhn et al., 2016; Janus & Duku, 2007). In the current study, children's gender was dummy coded (0 = boys; 1 = girls). Education attainment was measured on a four-point scale: 1 = less than junior high school, 2 = senior high school (including technical secondary school), 3 = up to 3 years of college education, 4 = 4 or more years of university or higher education. Monthly family income was measured on a four-point scale: 1 = under 3,000 RMB, 2 = 3,001 RMB–5,000 RMB, 3 = 5,001 RMB–10,000 RMB, 4 = over 10,001 RMB.

### Procedures

Participants were recruited from three kindergartens in urban areas of Beijing, China. Information about parental involvement, parenting self-efficacy, children's cognitive and social competence was collected through survey questionnaires completed by parents. Information about children's mathematics skill was collected via testing conducted by trained researchers. Three kindergartens were selected using a clustered random sampling method. We then contacted the kindergarten principals and obtained permission to conduct the study. Before asking for parents' consent to participate, both mothers and fathers were well informed about the purpose of the study and were assured of the confidentiality of their responses. Parents were asked to sign the consent form if they and their children wanted to participate in the study. Trained researchers then explained to parents how to fill in the questionnaires when they came to school to pick up their children, and both mothers and fathers were asked to complete them. Parents were asked to seal the completed questionnaires assessing parental involvement and parenting self-efficacy in an envelope and return them to the researcher within 1 week. We did not collect information about the kindergartens, such as the name of the institution or the name of the class teacher, to avoid potential social desirability bias. Therefore, a coding procedure was applied in the questionnaires in order to get data after 10 months.

Ten months later, researchers sent an invitation letter and a consent form to families who participated at Time 1. The mothers and fathers that participated in the follow-up study filled in a questionnaire assessing their children's cognitive development and social competence, and their children participated in the Child Individual Mathematics Test. Trained researchers used measures to finish the two tests in the classroom. To avoid nervousness or fear, a familiar teacher accompanied the child, but was not allowed to provide any hints. All procedures performed in this study were in accordance with the ethical standards of and approved by the institutional review committee at the study's home institution. The data collection process was completely anonymous, and participants' responses were fully confidential. Researchers gave stickers to children and sent a

child development report to parents via email as a reward for participation.

The results of the *t*-test of parental involvement and parenting self-efficacy revealed no significant differences between the families that participated in the follow-up study and the families that did not ($t = 0.56$, $p > 0.05$; $t = 0.06$, $p > 0.05$; respectively).

### Data analyses

Descriptive statistics on all study variables were conducted. A measurement model that presented all latent variable correlations was conducted using Mplus 7.4. After confirming the fit of the measurement model, the Actor-Partner Interdependence Model was investigated. As mentioned above, 9.3% (45) of data were missing, mainly due to children's illness, change schools or traveling on the days of assessments. Data missing for these reasons were considered missing completely at random (MCAR), because these are objective and irresistible. The result of the t-test of parental involvement and parenting self-efficacy showed no significant differences between the families that participated in the follow-up study and the families that did not. Any missing data from the present study were handled using the full information maximum likelihood (FIML) method (Acock, 2005; Duncan et al., 1998). The indirect effect model was tested using bootstrapping (with 5,000 replicates) to calculate the 95% confidence interval (CI). The indirect effect was considered significant when the CI did not include zero. Covariates were included in the model as exogenous variables.

## Results

Descriptive statistics and zero-order correlations for all study variables are presented in Table 1. Language and cognitive development, mathematics ability, and social competence were standardized (Z-score) and children's school readiness was then identified as an observed construct by three standard scores. The results revealed that maternal and paternal involvement were positively associated with both maternal and paternal parenting self-efficacy. Maternal and paternal involvement and maternal and paternal parenting self-efficacy were significantly correlated with at least two dimensions of children's school readiness. For example, maternal school-based and family-based involvement were positively associated with children's language and cognitive development. Each of the covariates was significantly correlated with at least one of the key study variables, justifying the necessity of controlling for their effects in the primary analyses.

The structural equation modeling was used to examine the mediating role of maternal and paternal parenting self-efficacy (Time 1) between maternal and paternal involvement (Time 1) and children's school readiness (Time 2). In the structural equation modeling, children's school readiness at Time 1 and children's age and gender, parents' educational levels, and family income were controlled. The resulting standardized coefficients for tested models were shown in Fig. 1.

Model fit was determined using chi-square, root mean square error of approximation (RMSEA), standardized root-mean-square residual (SRMR), and comparative fit index (CFI). A non-significant $\chi^2$, RMSEA < 0.08, SRMR < 0.08, and CFI > 0.90, were considered to indicate an acceptable model fit (Kline, 2011). As shown in Fig. 1, the model with maternal and paternal parenting self-efficacy as mediators fit the data well: $\chi^2/df = 1.64$, RMSEA = 0.05 with 95% CI (0.05, 0.05), SRMR = 0.04, and CFI = 0.97. Maternal and paternal involvement were not significantly related to children's school readiness ($\beta = -0.12$, $p > 0.05$; $\beta = -0.08$, $p > 0.05$; respectively). However, maternal involvement was positively related to maternal and paternal parenting self-efficacy ($\beta = 0.66$, $p < 0.00$; $\beta = 0.19$, $p < 0.01$; respectively), and paternal involvement was only positively related to paternal parenting self-efficacy ($\beta = 0.37$, $p < 0.00$), and not maternal parenting self-efficacy ($\beta = -0.03$, $p > 0.05$). In addition, both maternal and paternal parenting self-efficacy were positively related to children's school readiness ($\beta = 0.19$, $p < 0.01$; $\beta = 0.15$, $p < 0.05$; respectively).

Indirect effects between parental involvement and children's school readiness were examined using the bias-corrected bootstrap option. A total of 5,000 bootstrap samples indicated that the 95% CI for the indirect effect of maternal and paternal parenting self-efficacy between maternal involvement and children's school readiness did not include zero (95% CI [0.01, 0.39], 95% CI [0.01, 0.25], respectively), indicating that the indirect effects (0.13, 0.03, respectively) were significant. The indirect effect of paternal parenting self-efficacy between paternal involvement and children's school readiness did not include zero (95% CI [0.03, 0.15]) and the indirect effect (0.06) was also statistically significant. These results showed that maternal and paternal parenting self-efficacy fully mediated the link between maternal involvement and children's school readiness. Moreover, only paternal parenting self-efficacy fully mediated the link between paternal involvement and children's school readiness. In terms of effect sizes, standardized indirect effects of 0.01 were interpreted as "small", effects of 0.09 were interpreted as "medium", and effects of 0.25 were interpreted as "large" (Kenny, 2012). The magnitudes of all of the currently identified indirect effects were between "small" and "medium" (see Table 2 for details).

**Table 1** Descriptive statistics and bivariate correlations for study variables

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Age(T1) | - | | | | | | | | | | | | | | | | |
| 2 Gender(T1) | 0.05 | - | | | | | | | | | | | | | | | |
| 3 Education(T1) | 0.08 | 0.001 | - | | | | | | | | | | | | | | |
| 4 Income(T1) | 0.07 | 0.07 | 0.14** | - | | | | | | | | | | | | | |
| 5 MHSC(T1) | 0.03 | 0.14*** | 0.05 | 0.29*** | - | | | | | | | | | | | | |
| 6 MSBI(T1) | 0.23*** | 0.14*** | 0.18*** | 0.34*** | 0.49*** | - | | | | | | | | | | | |
| 7 MHBI(T1) | 0.02 | 0.09 | 0.17*** | 0.34*** | 0.50*** | 0.51*** | - | | | | | | | | | | |
| 8 FHSC(T1) | 0.11* | 0.08 | 0.13** | 0.23*** | 0.30*** | 0.21*** | 0.21*** | - | | | | | | | | | |
| 9 FSBI(T1) | 0.15** | 0.13** | 0.15** | 0.23*** | 0.31*** | 0.33*** | 0.21*** | 0.54*** | - | | | | | | | | |
| 10 FHBI(T1) | 0.18*** | 0.19*** | 0.08 | 0.29*** | 0.29*** | 0.25*** | 0.36*** | 0.54*** | 0.53*** | - | | | | | | | |
| 11 MSE(T1) | 0.11* | 0.02 | 0.05 | 0.09 | 0.34*** | 0.76*** | 0.57*** | 0.13** | 0.38*** | 0.37*** | - | | | | | | |
| 12 MCOE(T1) | 0.04 | 0.09 | 0.17** | 0.09 | 0.34*** | 0.53*** | 0.23*** | 0.13** | 0.16** | 0.27*** | 0.76*** | -- | | | | | |
| 13 FSE(T1) | 0.13** | 0.09 | 0.11* | 0.08 | 0.39*** | 0.39*** | 0.30*** | 0.32*** | 0.81*** | 0.49*** | 0.42*** | 0.38*** | - | | | | |
| 14 FCOE(T1) | 0.11* | 0.08 | 0.15** | 0.02 | 0.25*** | 0.30*** | 0.39*** | 0.32*** | 0.30*** | 0.50*** | 0.39*** | 0.46*** | 0.81*** | - | | | |
| 15 LCD(T2) | 0.27*** | 0.02 | 0.18*** | 0.09 | -0.23*** | 0.15** | 0.15** | -0.14** | 0.08 | 0.07 | 0.11* | 0.21*** | 0.14** | 0.17** | - | - | |
| 16 MD(T2) | 0.12* | 0.11* | 0.10* | 0.12* | -0.14** | -0.12* | -0.05 | -0.06 | -0.14** | 0.15** | 0.02 | 0.10* | 0.22*** | 0.08 | 0.52*** | - | |
| 17 SC(T2) | 0.25*** | 0.29*** | 0.26*** | 0.19*** | 0.06 | 0.19*** | 0.19*** | 0.10* | 0.11* | 0.11* | 0.14** | 0.25*** | 0.02 | 0.26*** | 0.17** | 0.15** | |
| Mean | 54.6 | 0.52 | 2.63 | 3.08 | 2.34 | 2.39 | 2.67 | 2.12 | 2.02 | 2.47 | 4.72 | 4.68 | 4.65 | 4.65 | 8.19 | 3.65 | 8.21 |
| Standard deviation | 9.18 | 0.25 | 0.62 | 0.86 | 0.69 | 0.75 | 0.64 | 0.73 | 0.71 | 0.66 | 0.78 | 0.75 | 0.77 | 0.77 | 1.52 | 1.61 | 1.33 |

*Note.* Age: child age, Gender: child gender, Education: parent education attainment, Income: family monthly income, MHSC: Mothers' home-school conferencing, MSBI: Mothers' school-based involvement, MHBI: Mothers' home-based involvement, FHSC: Fathers' home-school conferencing, FSBI: Fathers' school-based involvement, FHBI: Fathers' home-based involvement, MSE: Maternal strategies efficacy, MCOE: mothers' child outcomes efficacy, FSE: paternal strategies efficacy, FCOE: fathers' child outcomes efficacy, LCD: language and cognitive development, MD: Math ability, SC: social competence, T1: Time 1, T2: Time 2. $^{*}p<0.05$, $^{**}p<0.01$, $^{***}p<0.001$ (two-tailed)

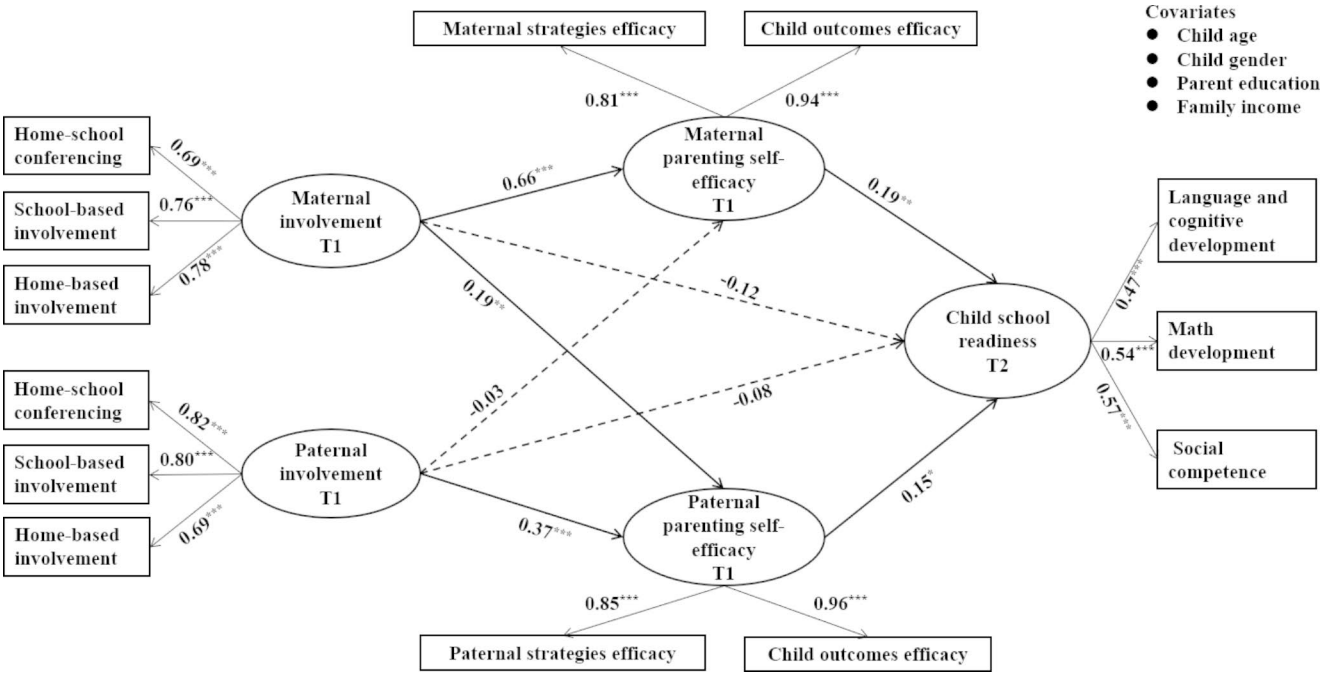


**Fig. 1** Structural model for parental involvement, parenting self-efficacy, and children's school readiness
*Note.* For clarity, covariates are not shown in the figure. The solid lines indicate that the path is significant. $^{*}p<0.05$, $^{**}p<0.01$, $^{***}p<0.001$ (two-tailed)

**Table 2** The bootstrap confidence interval and effect size of the mediation model

| Specific indirect pathways tested in the model | 95% CI | Indirect effects |
|---|---|---|
| Maternal involvement → maternal parenting self-efficacy → children's school readiness | **[0.004, 0.015]** | **0.13** |
| Maternal involvement → paternal parenting self-efficacy → children's school readiness | **[0.005, 0.029]** | **0.03** |
| Paternal involvement→paternal parenting self-efficacy→children's school readiness | [-0.008, 0.018] | 0.01 |
| Paternal involvement→maternal parenting self-efficacy→children's school readiness | **[0.004, 0.010]** | **0.06** |

*Note.* The bold indirect statistics are significant based on the bias-corrected bootstrapped 95% CI.

## Discussion

In the present study, we used the APIMeM to explore the associations among parental involvement, parental parenting self-efficacy and children's school readiness separately for mothers and fathers. The present study contributes to the literature by showing the predicted effect of parental involvement and parental parenting self-efficacy for children's school readiness with a longitudinal sample of Chinese families. Importantly, this study revealed that these associations varied for mothers and fathers. The results revealed that both maternal and paternal parenting self-efficacy mediated the association between maternal involvement and children's school readiness. For fathers, only paternal parenting self-efficacy mediated the association between paternal involvement and children's school readiness. Our results revealed the heterogeneity of the role of maternal and paternal parenting process on children's school readiness in a Chinese setting, suggesting some potential interventions for promoting children's school readiness in China.

### The direct effect of parental involvement on children's school readiness

Our results revealed that the direct effect of maternal and paternal involvement on children's school readiness was not significant. That is, the hypothesis that parental involvement positively predicting their children's school readiness was rejected. To some extent, our results are similar to those of previous studies. For example, a study of 266 Chinese families suggested that the high level of parental help was not a useful resource for increasing achievement (Wei, 2012). In addition, Chang and colleagues (2015) reported that parents' informal contact with school did not show significant effects on their children's mathematics performance in Hispanic and Asian groups. No consistent conclusion has been reached regarding the influence of parental involvement on child development, which may be related to the cultural context of parental involvement. Hill et al. (2004) found that there were racial differences in the influence of parental involvement on child development; that is, parental

academic involvement was positively related to achievement among African Americans, but not among European Americans. Importantly, some researchers have proposed that parental involvement is more likely to have no effect or a negative effect on children's development in the context of Chinese culture (Guo et al., 2017). In a Confucian cultural environment, Chinese parents value children's academic achievement, which can lead to parents behaving in a controlling manner toward their children (Tan et al., 2012; Zou et al., 2013). In China, it is common for parents to encourage their children to learn literacy and numeracy early so that they can perform better in primary school. However, excessive control may prevent parental involvement from playing a positive role in child development. Although the education sector has made substantial efforts to reverse this unscientific educational concept and the inappropriate participation of parents, the results have been unsatisfactory.

In addition, parental involvement may be problem-oriented; thus, when children perform poorly, parents may have more contact with teachers and participate more at home. This kind of problem-oriented involvement is not initiated by parents, but is induced by problems in children's development. In general, for Chinese parents who focus on child development, this type of parental involvement may be associated with negative emotion because of the child's poor performance. Therefore, parental involvement may not play a direct positive role in promoting children's school readiness. Other longitudinal studies support the current finding that mothers and fathers are equally distressed by their child's displays of problem behavior, resulting in inept discipline (Meunier et al., 2010).

## The indirect effect of individual parenting self-efficacy (actor effect)

Although maternal and paternal involvement may not directly influence children's school readiness, they do so indirectly by changing parenting self-efficacy. The results revealed that parenting self-efficacy mediated the association between parental involvement and children's school readiness for both mothers and fathers. In other words, for either mother or father, the research hypothesis of the mediating effect of their own parenting self-efficacy was supported. This finding suggests that there is an actor effect between parental involvement and parenting efficacy, which is consistent with the spillover hypothesis (Zemp et al., 2018). Thus, paternal and maternal involvement were positively associated with their own parenting self-efficacy. One possible explanation is that feedback from maternal and paternal involvement subsequently affects mothers' and fathers' perceptions of their ability to parent effectively (Ardelt & Eccles, 2001). Bandura (1986, 1997) offers theoretical support for this premise. According to Bandura's social cognitive theory, direct participation in actual tasks leads to a sense of efficacy. Thus, individuals who have achieved positive outcomes in a particular activity report greater self-efficacy in that domain. Likewise, a parent would be expected to experience a positive sense of efficacy as a parent when their participation in their children's education activities leads to positive outcomes, such as greater parental knowledge about the child's life (Chung et al., 2014).

Our results indicate that parenting self-efficacy plays an important role in the effect of maternal and paternal involvement on children's development. When parents have high confidence in their parenting, they tend to interact with their children more safely and enjoy parent-child interaction more (Gondoli & Silverberg, 1997), show more warmth in the interaction, and have a greater ability to respond to their children's behavior (Shumow & Lomax, 2002), thus promoting various aspects of children's development. In addition, parents with a higher sense of competence tend to feel more secure and create a more positive home environment. In general, high levels of self-efficacy have been found to predict competence in the face of environmental demands, conceptualize difficult situations as challenges, have less negative emotional arousal in the face of stress, and exhibit perseverance when challenged (Jerusalem & Mittag, 1995). A secure and positive home environment allows children to explore the world and gain knowledge. In contrast, a lack of confidence in parenting is likely to increase frustration, distress, irritation, and anger in parents, which has a negative impact on children's development (Kohlhoff & Barnett, 2013).

## The indirect effect of partner parenting self-efficacy (partner effect)

The current results revealed that, in addition to maternal parenting self-efficacy, maternal involvement was positively associated with paternal parenting self-efficacy, which ultimately predicted a higher level of children's school readiness, showing various mechanisms of maternal involvement in children's school readiness. This represents the actor effect between parental involvement and parenting efficacy and is congruent with the perspective of the crossover hypothesis, which posits that the behavior or emotional experience of one individual is transmitted from one domain to another (Bolger et al., 1989). Thus, the mother's parenting behavior may affect the father's sense of parenting competence. This notion is also supported by family system theory (Minuchin, 1985), in which family members are in different positions, and members interact and depend on each other.

This indirect effect can also be explained by self-efficacy theory (Bandura, 1986, 1997), which proposes that

self-efficacy can be generated not only from direct experience, but also from vicarious experience (Mandy & Francis, 2006). Thus, maternal involvement as an indirect experience could enhance paternal parenting self-efficacy. In the parenting process, the mother, as an experienced child-rearing subject, is the object of the father's observation and learning. Specific gender roles in Confucian contexts may reinforce the result that mothers usually bear the main burden of educating children in Chinese society (Jhang & Lee, 2017). On the one hand, the father obtains self-cognition by observing the mother's involvement behavior, and judges his own parenting self-efficacy by referring to the mother's performance in participating in children's educational activities. Therefore, when the mother participates in the education of children for a long time, the father may think that he is likely to participate in the education of children just like the mother, and has a rich educational experience, thus enhancing the father's parenting efficiency. On the other hand, the mother could provide indirect experience for the father to participate in children's education, which is conducive to the father learning effective methods and strategies to participate in children's education from the mother's involvement, enhancing the father's parenting confidence.

However, the results of this study suggest that paternal involvement does not promote children's school readiness by enhancing maternal parenting self-efficacy. Obviously, the research hypothesis of the mediating effect of spouse's parenting self-efficacy was not fully supported. This may be mainly because maternal involvement is significantly higher than paternal involvement in many cultural contexts, especially in Confucian cultures (Keown & Palmer, 2014; Lau et al., 2011; Mikelson, 2010). Generally speaking, for young children, the mother is the primary nurturer, has more parenting experience and strategies, and is more likely to be the object of observation and learning by the father. However, fathers with low levels of involvement may not serve as role models for mothers during the parenting process.

## Practical implications

The present study has important practical implications for family interventions as an approach for improving children's school readiness. First, some parenting programs to improve parental involvement and parenting self-efficacy may be helpful for promoting children's development. These parental training and intervention programs could provide mothers and fathers with various forms of educational support, such as home visits, parenting packages, and online courses. In addition, parental training and intervention programs targeting Chinese parents should consider Chinese cultural traditions with respect to childrearing. In a Confucian context, parents should pay attention to the various aspects of their children's school readiness and tolerate their children's deficiencies in the school preparation process.

Importantly, our findings highlight the differences in parenting between mothers and fathers. The development of separate intervention programs for mothers and fathers may be more conducive to enhancing parental involvement and parenting self-efficacy. We recommend separate educational interventions for fathers and mothers. For example, intervention programs could consider encouraging fathers to participate in children's education and providing skills for father-child interaction. In addition, family education intervention involving both mother and father is also beneficial to child development. The concept of co-parenting should be known to both fathers and mothers. In the family, father and mother are not independent individuals, they interact with each other. Therefore, co-operative parenting practices (such as sharing parenting experiences) should be introduced to parents. For mothers, intervention programs could guide mothers to help fathers to participate in parenting.

## Limitations and future research

Several limitations of the current study and potential avenues for future research should be considered. First, the data from one city may not represent geographic diversity. Given the vast geographical size of China and the diversity of family parenting, future studies with larger samples covering different regions with urban and rural areas should be considered. Second, although we did our best to avoid social approval effects, we acknowledge that language, cognitive development and social competence reported by parents may produce some deviations. Observational methods should be used in future research. Third, the current study only tested parenting self-efficacy as a mediator for the relationship between parental involvement and children's school readiness. There may be some moderating factors (e.g., family socioeconomic status, child gender) for this association, which merit future research (Jeynes, 2007). Fourth, in view of the three types of parental involvement including home-school conferencing, school-based involvement, and home-based involvement, future research may examine the relationships among different types of parental involvement, parenting self-efficacy, and children's school readiness. Fifth, our study includes a high proportion of families with a high level of education, which may not be very representative of the general population. Focusing on families with different levels of education or families with lower levels of education is a direction for future research. Sixth, this study collected both parental involvement and parenting self-efficacy at the same time, and a more rigorous longitudinal design or multiwave design is recommended.

## Conclusion

The current study examined the relationship among maternal and paternal involvement, maternal and paternal parenting self-efficacy, and children's school readiness in a longitudinal sample of the Chinese population using the Actor-Partner Interdependence Mediation Model. The results indicate that parenting self-efficacy plays an important role in parental involvement and children's school readiness. Notably, the effect path of maternal involvement on children's school readiness is more diversified. Specifically, maternal involvement can promote children's school readiness through its indirect associations with both maternal and paternal parenting self-efficacy. Compared with maternal involvement, the mechanisms of the effect of paternal involvement on children's school readiness are relatively simple. That is, paternal involvement can only promote children's school readiness via fathers' own parenting self-efficacy. This study contributes to the existing literature by elucidating the differences and interdependence of mothers and fathers in the parenting process. The findings have implications for the development of more targeted interventions aimed at facilitating children's school readiness through promoting the involvement and parenting self-efficacy of both mothers and fathers.

**Funding** This work was supported by the International Joint Research Project of Huiyan Internatinoal College, Faculty of Education, Beijing Normal University (Approval No. ICER202202).

**Data Availability** The data that support the findings of this study are available from the corresponding author on reasonable request.

## Declarations

**Conflict of interest** The authors declare that they have no competing interests.

**Ethics approval** Approval was obtained from the ethics committee of Beijing Normal University.

**Consent to participate** Informed consent was obtained from all individual participants included in the study.

## References

Acock, A. C. (2005). Working with missing values. *Journal of Marriage and Family*, *67*, 1012–1028. https://doi.org/10.1111/j.1741-3737.2005.00191.x

Ansari, A., Pianta, R. C., Whittaker, J. E., Vitiello, V., & Ruzek, E. (2021). Enrollment in public-prekindergarten and school readiness skills at kindergarten entry: Differential associations by home language, income, and program characteristics. *Early Childhood Research Quarterly*, *54*, 60–71. https://doi.org/10.1016/j.ecresq.2020.07.011

Ardelt, M., & Eccles, J. S. (2001). Effects of mothers' parental efficacy beliefs and promotive parenting strategies on inner-city youth. *Journal of Family Issues*, *22*, 944–972. https://doi.org/10.1177/019251301022008001

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.

Bolger, N., Delongis, A., & Wethington, K. E. (1989). The contagion of stress across multiple roles. *Journal of Marriage and Family*, *51*(1), 175–183. https://doi.org/10.2307/352378

Boonk, L., Gijselaers, H. J. M., Ritzen, H., & Brand-Gruwel, S. (2018). A review of the relationship between parental involvement indicators and academic achievement. *Educational Research Review*, *24*, 10–30. https://doi.org/10.1016/j.edurev.2018a.02.001

Castro-Schilo, L., Taylor, Z. E., Ferrer, E., Robins, R. W., Conger, R. D., & Widaman, K. F. (2013). Parents' optimism, positive parenting, and child peer competence in mexican-origin families. *Parenting*, *13*(2), 95–112. https://doi.org/10.1080/15295192.2012.709151

Cerniglia, L., Cimino, S., & Ballarotto, G. (2014). Mother-child and father-child interaction with their 24-month-old children during feeding, considering paternal involvement and the child's temperament in a community sample. *Infant Mental Health Journal*, *35*(5), 473–481. https://doi.org/10.1002/imhj.21466

Chang, M., Choi, N., & Kim, S. (2015). School involvement of parents of linguistic and racial minorities and their children's mathematics performance. *Educational Research and Evaluation*, *21*(3), 209–231. https://doi.org/10.1080/13803611.2015.1034283

Chung, G. H., Lee, H., Lee, J., & Lee, K. (2014). A mediational model of school involvement, knowledge about a child's school life, and parental efficacy among south korean mothers. *Journal of Child and Family Studies*, *24*(4), 899–908. https://doi.org/10.1007/s10826-014-9900-0

Coleman, P. K., & Karraker, K. H. (1998). Self-efficacy and parenting quality: Findings and future applications. *Developmental Review*, *18*, 47–85. https://doi.org/10.1006/drev.1997.0448

Coleman, P. K., & Karraker, K. H. (2000). Parenting self-efficacy among mothers of school-age children: Conceptualization, measurement, and correlates. *Family Relations*, *49*, 13–24. https://doi.org/10.1111/j.1741-3729.2000.00013.x

Coleman, P. K., & Karraker, K. H. (2003). Maternal self-efficacy beliefs, competence in parenting, and toddlers' behavior and developmental status. *Infant Mental Health Journal*, *24*, 126–148. https://doi.org/10.1002/imhj.10048

Coleman, P. K., Trent, A., Bryan, S., King, B., Rogers, N., & Nazir, M. (2002). Parenting behavior, mothers' self-efficacy beliefs, and toddler performance on the Bayley scales of infant development. *Early Child Development and Care*, *172*(2), 123–140. https://doi.org/10.1080/03004430210888

Cook, W. L., & Kenny, D. A. (2005). The actor–partner interdependence model: A model of bidirectional effects in developmental studies. *International Journal of Behavioral Development*, *29*(2), 101–109. https://doi.org/10.1080/01650250444000405

Curran, F. C., Little, M. H., Cohen-Vogel, L., & Domina, T. (2020). School readiness assessments for class placements and academic sorting in kindergarten. *Educational Policy*, *34*, 518–547. https://doi.org/10.1177/0895904818802109

Day, R. D., & Padillawalker, L. M. (2009). Mother and father connectedness and involvement during early adolescence. *Journal of Family Psychology*, *23*(6), 900–904. https://doi.org/10.1037/a0016438

Dove, M. K., Neuharth-Pritchett, S., Wright, D. W., & Wallinga, C. (2015). Parental involvement routines and former head start children's literacy outcomes. *Journal of Research in Childhood*

*Education*, *29*(2), 173–186. https://doi.org/10.1080/02568543.2015.1011360

Dubeau, D., Coutu, S., & Lavigueur, S. (2013). Links between different measures of mother/father involvement and child social adjustment. *Early Child Development and Care*, *183*(6), 791–809. https://doi.org/10.1080/03004430.2012.723442

Duncan, T. E., Duncan, S. C., & Li, F. (1998). A comparison of model-and multiple imputation–based approaches to longitudinal analyses with partial missingness. *Structural Equation Modeling: A Multidisciplinary Journal*, *5*(1), 1–21. https://doi.org/10.1080/10705519809540086

Duncan, R. J., Schmitt, S. A., Burke, M., & Mcclelland, M. M. (2018). Combining a kindergarten readiness summer program with a self-regulation intervention improves school readiness. *Early Childhood Research Quarterly*, *42*, 291–300. https://doi.org/10.1016/j.ecresq.2017.10.012

Duursma, E. (2014). The effects of fathers' and mothers' reading to their children on language outcomes of children participating in early head start in the united states. *Fathering A Journal of Theory Research & Practice About Men as Fathers*, *12*(3), 283–303. https://doi.org/10.3149/fth.1203.283

Fan, X., & Chen, M. (2001). Parental involvement and students' academic achievement: A meta-analysis. *Educational Psychology Review*, *13*(1), 1–22. https://doi.org/10.1023/A:1009048817385

Fantuzzo, J., Gadsden, V., Li, F., Sproul, F., Mcdermott, P., Hightower, D., & Minneya, A. (2013). Multiple dimensions of family engagement in early childhood education: Evidence for a short form of the family involvement questionnaire. *Early Childhood Research Quarterly*, *28*(4), 734–742. https://doi.org/10.1016/j.ecresq.2013.07.001

Flouri, E., & Buchanan, A. (2004). Early father's and mother's involvement and child's later educational outcomes. *British Journal of Educational Psychology*, *74*(2), 141–153. https://doi.org/10.1348/000709904773839806

Glatz, T., & Buchanan, C. M. (2015). Over-time associations among parenting self-efficacy, promotive parenting practices, and adolescents' externalizing behaviors. *Journal of Family Psychology, 29*(3), 427–437. https://doi.org/10.1037/fam0000076

Gondoli, D. M., & Silverberg, S. B. (1997). Maternal emotional distress and diminished responsiveness: The mediating role of parenting efficacy and parental perspective taking. *Development Psychology*, *33*(5), 861–868. https://doi.org/10.1037/0012-1649.33.5.861

Graue, E. (2006). The answer is readiness: Now what is the question? *Early Education and Development*, *17*(1), 43–56. https://doi.org/10.1207/s15566935eed1701_3

Graves, S. L., Wright, J., & Brown, L. (2011). Parent involvement at school entry: A national examination of group differences and achievement. *School Psychology International*, *32*(1), 35–48. https://doi.org/10.1177/0143034310396611

Green, C., Walker, L., Joan, M., Hoover-Dempsey, T., & Sandler, M. (2007). Parents' motivations for involvement in children's education: An empirical test of a theoretical model of parental involvement. *Journal of Educational Psychology*, *99*, 532–544. https://doi.org/10.1037/0022-0663.99.3.532

Grissmer, D., Grimm, K. J., Aiyer, S. M., Murrah, W. M., & Steele, J. S. (2010). Fine motor skills and early comprehension of the world: Two new school readiness indicators. *Developmental Psychology*, *46*(5), 1008–1017. https://doi.org/10.1037/a0020104

Guhn, M., Milbrath, C., & Hertzman, C. (2016). Associations between child home language, gender, bilingualism and school readiness: A population-based study. *Early Childhood Research Quarterly*, *35*(2), 95–110. https://doi.org/10.1016/j.ecresq.2015.11.003

Guo, X., Zhou, X., Dou, G., Liu, C., & Luo, L. (2017). Relationship between parental involvement and academic achievement of elementary school students: Joint moderating effects of educational aspiration and academic self-efficacy. *Journal of Beijing Normal University*, *206*(2), 46–54. (In Chinese).

Hair, E., Halle, T., Terry-Humen, E., Lavelle, B., & Calkins, J. (2006). Children's school readiness in the ECLS-K: Predictions to academic, health, and social outcomes in first grade. *Early Childhood Research Quarterly*, *21*(4), 431–454. https://doi.org/10.1016/j.ecresq.2006.09.005

Hill, N. E., & Tyson, D. F. (2009). Parental involvement in middle school: A meta-analytic assessment of the strategies that promote achievement. *Developmental Psychology*, *45*(3), 740–763. https://doi.org/10.1037/a0015362

Hill, N. E., Castellino, D. R., Lansford, J. E., Nowlin, P., Dodge, K. A., Bates, J. E., & Pettit, G. S. (2004). Parent academic involvement as related to school behavior, achievement, and aspirations: Demographic variations across adolescence. *Child Development*, *75*(5), 1491–1509. https://doi.org/10.1111/j.1467-8624.2004.00753.x

Hindman, A. H., Skibbe, L. E., Miller, A., & Zimmerman, M. (2010). Ecological contexts and early learning: Contributions of child, family, and classroom factors during head start, to literacy and mathematics growth through first grade. *Early Childhood Research Quarterly*, *25*(2), 235–250. https://doi.org/10.1016/j.ecresq.2009.11.003

Hoffman, J. A., Uretsky, M. C., Patterson, L. B., & Green, B. L. (2020). Effects of a school readiness intervention on family engagement during the kindergarten transition. *Early Childhood Research Quarterly*, *53*, 86–96. https://doi.org/10.1016/j.ecresq.2020.02.005

Holloway, S. D., Campbell, E. J., Nagase, A., Kim, S., Suzuki, S., Wang, Q., Iwatate, K., & Baak, S. Y. (2016). Parenting self-efficacy and parental involvement: Mediators or moderators between socioeconomic status and children's academic competence in Japan and Korea? *Research in Human Development*, *13*, 258–272. https://doi.org/10.1080/15427609.2016.1194710

Janus, M., & Duku, E. (2007). The school entry gap: Socioeconomic, family, and health factors associated with children's school readiness to learn. *Early Education & Development*, *18*(3), 375–403. https://doi.org/10.1080/10409280701610796a

Janus, M., & Offord, D. R. (2007). Development and psychometric properties of the early development instrument (EDI): A measure of children's school readiness. *Canadian Journal of Behavioural Science*, *39*(1), 1–22. https://doi.org/10.1037/cjbs2007001

Jerusalem, M., & Mittag, W. (1995). Self-efficacy in stressful life transitions. In A. Bandura (Ed.), *Self-efficacy in changing societies* (pp. 177–201). New York: Cambridge University Press.

Jeynes, W. H. (2007). The relationship between parental involvement and urban secondary school student academic achievement: A meta-analysis. *Urban Education*, *42*(1), 82–110. https://doi.org/10.1177/0042085906293818

Jhang, F. H., & Lee, Y. T. (2017). The role of parental involvement in academic achievement trajectories of elementary school children with southeast asian and taiwanese mothers. *International Journal of Educational Research*, *89*, 68–79. https://doi.org/10.1016/j.ijer.2017.09.003

Jones, T. L., & Prinz, R. J. (2005). Potential roles of parental self-efficacy in parent and child adjustment: A review. *Clinical Psychology Review*, *25*(3), 341–363. https://doi.org/10.1016/j.cpr.2004.12.004

Kenny, D. A. (1996). Models of non-independence in dyadic research. *Journal of Social and Personal Relationships*, *13*(2), 279–294. https://doi.org/10.1177/0265407596132007

Kenny, D. A. (2012). *Mediation*. Retrieved from http://davidakenny.net/cm/mediate.htm

Kenny, D. A., & Ledermann, T. (2010). Detecting, measuring, and testing dyadic patterns in the actor–partner interdependence model. *Journal of Family Psychology*, *24*(3), 359–366. https://doi.org/10.1080/01650250444000405

Keown, L. J., & Palmer, M. (2014). Comparisons between paternal and maternal involvement with sons: Early to middle childhood. *Early Child Development and Care*, *184*(1), 99–117. https://doi.org/10.1080/03004430.2013.773510

Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.).). New York, NY: The Guilford Press.

Kohlhoff, J., & Barnett, B. (2013). Parenting self-efficacy: Links with maternal depression, infant behaviour, and adult attachment. *Early Human Development*, *89*(4), 249–256. https://doi.org/10.1016/j.earlhumdev.2013.01.008

Kung, H. Y., & Lee, C. Y. (2016). Multidimensionality of parental involvement and children's mathematics achievement in Taiwan: Mediating effect of math self-efficacy. *Learning and Individual Differences*, *47*, 266–273. https://doi.org/10.1016/j.lindif.2016.02.004

Lau, E. Y. H., Li, H., & Rao, N. (2011). Parental involvement and children's readiness for school in China. *Educational Research*, *53*(1), 95–113. https://doi.org/10.1080/00131881.2011.552243

Lamb, M. E., & Lewis, C. (2004). The development and significance of father-child relationships in two-parent families. In M. E. Lamb (Eds.), *The role of the father in child development* (4th edn.). New York, NY: John Wiley & Sons.

Ledermann, T., Macho, S., & Kenny, D. A. (2011). Assessing mediation in dyadic data using the actor-partner interdependence model. *Structural Equation Modeling A Multidisciplinary Journal*, *18*(4), 595–612. https://doi.org/10.1080/10705511.2011.607099

Li, X., & Wei, X. (2017). Father involvement and children's social competence: Mediating effects of maternal parenting self-efficacy. *Journal of Beijing Normal University*, *62*(5), 49–58. (In Chinese).

Liu, Q., & Li, X. (2019). Revision of family involvement questionnaire-short form in parents of Preschool Children in China. *Chinese Journal of Clinical Psychology*, *27*(1), 49–53. (In Chinese).

Lohndorf, R. T., Vermeer, H. J., Harpe, C., & Mesman, J. (2021). Socioeconomic status, parental beliefs, and parenting practices as predictors of preschoolers' school readiness and executive functions in Chile. *Early Childhood Research Quarterly*, *57*(4), 61–74. https://doi.org/10.1016/j.ecresq.2021.05.001

Mandy, H., & Francis, M. (2006). An investigation of the influence of vicarious experience on perceived self-efficacy. *Journal of Experiential Education*, *28*(3), 257–258. https://doi.org/10.1177/105382590602800310

Maxwell, S. E., & Cole, D. A. (2007). Bias in cross-sectional analyses of longitudinal mediation. *Psychological Methods*, *12*, 23–44. https://doi.org/10.1037/1082-989X.12.1.23

Meunier, J. C., Roskam, I., & Browne, D. T. (2010). Relations between parenting and child behavior: Exploring the child's personality and parenting self-efficacy as third variables. *International Journal of Behavioral Development*, *35*, 246–259. https://doi.org/10.1177/0165025410382950

Mikelson, K., S (2010). He said, she said: Comparing mother and father reports of father involvement. *Journal of Marriage & Family*, *70*(3), 613–624. https://doi.org/10.1111/j.1741-3737.2008.00509.x

Minuchin, P. (1985). Family development and the child families and individual development: Provocations from the field of family therapy. *Child Development*, *56*(2), 289–302. https://doi.org/10.2307/1129720

National Bureau of Statistics of China (2020). *China statistical yearbook*. http://www.stats.gov.cn/tjsj/ndsj/2020/indexch.htm

National Education Goals Panel (1995). *Executive summary to the 1995 goals report: Improving education through family–school–community partnerships* (Technical Report No. 96 – 03). Washington, DC: U.S. Government Printing Office.

Newland, R. P., Ciciolla, L., & Crnic, K. A. (2015). Crossover effects among parental hostility and parent-child relationships during the preschool period. *Journal of Child and Family Studies*, *24*(7), 2107–2119. https://doi.org/10.1007/s10826-014-0012-7

Pan, Y., Gauvain, M., Liu, Z., & Cheng, L. (2006). American and chinese parental involvement in young children's mathematics learning. *Cognitive Development*, *21*(1), 17–35. https://doi.org/10.1016/j.cogdev.2005.08.001

Romano, E., Babchishin, L., Pagani, L. S., & Kohen, D. (2010). School readiness and later achievement: Replication and extension using a nationwide canadian survey. *Developmental Psychology*, *46*(5), 995–1007. https://doi.org/10.1037/a0018880

Rouse, H. L., & Fantuzzo, J. W. (2009). Multiple risks and educational well-being: A population-based investigation of threats to early school success. *Early Childhood Research Quarterly*, *24*, 1–14. https://doi.org/10.1016/j.ecresq.2008.12.001

Sagui-Henson, S. J., Armstrong, L. M., Mitchell, A. D., Basquin, C. A., & Levens, S. M. (2020). The effects of parental emotion regulation ability on parenting self-efficacy and child diet. *Journal of Child and Family Studies*, *29*, 2290–2302. https://doi.org/10.1007/s10826-020-01745-x

Schulting, A. B., Malone, P. S., & Dodge, K. A. (2005). The effect of school-based kindergarten transition policies and practices on child academic outcomes. *Developmental Psychology*, *41*(6), 860–871. https://doi.org/10.1037/0012-1649.41.6.860

Shumow, L., & Lomax, R. (2002). Parental efficacy: Predictor of parenting behavior and adolescent outcomes. *Parenting*, *2*(2), 127–150. https://doi.org/10.1207/S15327922PAR0202_03

Sibley, E., & Dearing, E. (2014). Family educational involvement and child achievement in early elementary school for american-born and immigrant families. *Psychology in the Schools*, *51*(8), 814–831. https://doi.org/10.1002/pits.21784

Silinskas, G., & Kikas, E. (2019). Parental involvement in math homework: Links to children's performance and motivation. *Scandinavian Journal of Educational Research*, *63*, 17–37. https://doi.org/10.1080/00313831.2017.1324901

Slagt, M., Dekovi?, M., De Haan, A. D., Van, A. A. L., & Prinzie, P. (2012). Longitudinal associations between mothers' and fathers' sense of competence and children's externalizing problems: The mediating role of parenting. *Developmental Psychology*, *48*(6), 1554–1562. https://doi.org/10.1037/a0027719

Snow, K. L. (2006). Measuring school readiness: Conceptual and practical considerations. *Early Education & Development*, *17*(1), 7–41. https://doi.org/10.1207/s15566935eed1701_2

Susan, D., Holloway, Emily, J., Campbell, et al. (2016). Parenting self-efficacy and parental involvement: Mediators or moderators between socioeconomic status and children's academic competence in Japan and Korea? *Research in Human Development*, *13*(3), 258–272. https://doi.org/10.1080/15427609.2016.1194710

Suzuki, S., Holloway, S. D., Yamamoto, Y., & Mindnich, J. D. (2009). Parenting self-efficacy and social support in Japan and the United States. *Journal of Family Issues*, *30*(11), 1505–1526. https://doi.org/10.1177/0192513X09336830

Tan, T. X., Camras, L. A., Deng, H., Zhang, M., & Lu, Z. (2012). Family stress, parenting styles, and behavioral adjustment in preschool-age adopted chinese girls. *Early Childhood Research Quarterly*, *27*(1), 128–136. https://doi.org/10.1016/j.ecresq.2011.04.002

Weavera, C. M., Shawa, D. S., Dishionb, T. J., & Wilsonc, M. N. (2008). Parenting self-efficacy and problem behavior in children at high risk for early conduct problems: The mediating role of maternal depression. *Infant Behavior and Development*, *31*(4), 594–605. https://doi.org/10.1016/j.infbeh.2008.07.006

Wei, D. (2012). Parental influence on chinese students' achievement: A social capital perspective. *Asia Pacific Journal of Education*, *32*(2), 153–166. https://doi.org/10.1080/02188791.2012.684951

Wen, X., Bulotsky-Shearer, R. J., Hahs-Vaughn, D. L., & Korfmacher, J. (2012). Head start program quality: Examination of classroom quality and parent involvement in predicting children's

vocabulary, literacy, and mathematics achievement trajectories. *Early Childhood Research Quarterly*, *27*(4), 640–653. https://doi.org/10.1016/j.ecresq.2012.01.004

Xia, X., Hackett, R. K., & Webster, L. (2019). Chinese parental involvement and children's school readiness: The moderating role of parenting style. *Early Education and Development*, (4), 250–268. https://doi.org/10.1080/10409289.2019.1643439

Zemp, M., Johnson, M. D., & Bodenmann, G. (2018). Within-family processes: Interparental and coparenting conflict and child adjustment. *Journal of Family Psychology*, *32*(3), 299–309. https://doi.org/10.1037/fam0000368

Zou, W., Anderson, N., & Tsey, K. (2013). Middle-class chinese parental expectations for their children's education. *Procedia-Social and Behavioral Sciences*, *106*, 1840–1849. https://doi.org/10.1016/j.sbspro.2013.12.209