

The Associations between Mothers' and Grandmothers' Depressive Symptoms, Parenting Stress, and Relationship with Children: An Actor–Partner Interdependence Mediation Model

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Three-generation households that include parents and grandparents raising children together have become increasingly common in China. This study examined the relations among depressive symptoms, parenting stress, and caregiver–child relationships in the mother–grandmother dyadic context. Participants were mothers and grandmothers from 136 three-generation households. Results from Actor–Partner Interdependence Mediation Modeling indicated that mothers' depressive symptoms were indirectly related to mother–child conflict/closeness through own parenting stress; grandmothers' depressive symptoms were indirectly related to grandmother–child conflict through own parenting stress. Mothers' depressive symptoms were indirectly related to grandmothers' conflict with children through grandmothers' parenting stress, and grandmothers' depressive symptoms were indirectly related to mothers' conflict/closeness with children through mothers' parenting stress. The relation between mothers' parenting stress and mother–child closeness was stronger than the relation between grandmothers' parenting stress and grandmother–child closeness. Findings highlight the implications of using a family system perspective and the dyadic approach in understanding and improving family functioning in Chinese three-generation households.

Keywords: Depressive Symptoms; Dyadic; Grandmothers; Parenting Stress; Parent–Child Relationship

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In China, due to the increase of work-related stress with the development of the economy, young parents have limited time to take care of their children. More and more grandparents volunteer to raise their grandchildren and the number of three-generation

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households that include grandparents, parents, and children is on the rise (Guo, 2014). According to a recent survey conducted by the China Research Center on Aging, 66.5% of grandparents in China involve in raising grandchildren (Li, Xie, & Song, 2016). Three-generation households where typically four caregivers (i.e., two grandparents and two parents) live together involve complex relationships among family members.

Numerous studies have suggested the importance of the maternal caregiver–child relationship. Maternal caregivers typically spend more time taking care of their children and children usually have a better and closer relationship with their maternal caregivers than with their paternal caregivers (Hrdy, 2005; Lang et al., 2014; Xu & Pei, 2012). Therefore, it is of great importance to understand maternal caregivers' relationship with children in three-generation households.

Two different dimensions of the caregiver–child relationship are frequently addressed in studies: caregiver–child conflict and caregiver–child closeness. Studies have demonstrated that poor mother–child relationship (e.g., mother–child conflict) is associated with more internalizing and externalizing problems among children (Georgiou & Fantl, 2013). On the contrary, high-quality mother–child relationship (e.g., mother–child closeness) reduces children's problem behaviors (Withers, Mcwey, & Lucier-Greer, 2016), buffers the adverse effect of stressful life events (Ge, Natsuaki, Neiderhiser, & Reiss, 2009), and promotes academic achievement (Harmeyer, Ispa, Palermo, & Carlo, 2016). Similar to the effect of mother–child relationship, poor grandmother–child relationship (e.g., grandmother–child alienation) has been associated with more depressive symptoms among children (Hayslip, Toledo, Henderson, Rodriguez, & Caballero, 2018), whereas positive grandmother–child relationship (e.g., grandmother–child closeness/trust) is associated with fewer emotional problems, lower hyperactivity, more prosocial behavior (Attar-Schwartz & Khoury-Kassabri, 2016), higher self-esteem (Hakoyama & Malone-Beach, 2017), and better interpersonal skills (Hayslip et al., 2018) among children. Thus, it is important to study factors associated with both mother–child relationship and grandmother–child relationship in three-generation households. Limited research, however, has explored the specific factors and processes related to both mother–child relationship and grandmother–child relationship in Chinese three-generation households.

According to the family system theory, family is comprised of subsystems, such as parent–child and mother–father dyads, and these family subsystems are interdependent (Cox & Paley, 1997). In extended families like three-generation families, there are different subsystems, such as grandmother–mother, grandmother–child, and mother–child subsystems. Notably, limited research has explored the relationship between these subsystems in three-generation families. Spillover effect suggests that affect or behavior experienced in one subsystem may directly transfer to another (Erel & Burman, 1995). Specifically, mothers' negative affect experienced in mother–grandmother subsystem may directly transfer to mother–child subsystem. According to crossover effect, emotion and behavior can transfer between people in the family (Westman & Vinokur, 1998). For example, mothers' negative affect may transfer to grandmother and then influence grandmother–child subsystem. Therefore, when exploring factors related to mother–child relationship and grandmother–grandchild relationship, it is essential to consider them in a dyadic context (Le, Fredman, & Feinberg, 2017).

Mothers' depressive symptoms can lead to decreased quality of mother–child relationship (Marmorstein & Iacono, 2004); similarly, grandmothers' depressive symptoms have been associated with lower grandmother–grandchild relationship quality (McCarty & McMahan, 2003; Myers & Johns, 2018). Due to spillover effects, depressive symptoms of caregivers can be expressed in caregiver–child subsystem. For example, mothers and grandmothers with depressive symptoms may feel more stress as a parent and perceive their interaction with children as dysfunctional (Thomason et al., 2014), which would in turn be correlated to lower mother–child and grandmother–grandchild relationship

quality (Garcia, Ren, Esteraich, & Raikes, 2017; Hakoyama & MaloneBeach, 2013). Mothers' and grandmothers' depressive symptoms may not only influence their own relationship with children but also their partners' relationship with children. Previous studies have found that caregivers' emotion problems (e.g., depressive symptoms, emotion dysregulation) can negatively impact their partner's relationship or communication with children (Li, Bai, Zhang, & Chen, 2018; Ponnet et al., 2013).

Parenting stress plays an important role in influencing mother-child and grandmother-grandchild relationships (Emick & Hayslip, 1999; Garcia et al., 2017). Parenting stress, which consists of parental distress, parent-child dysfunctional interaction, and difficult child, refers to stress that stems specifically from interactions with children and the parenting role (Abidin, 1995). Parenting stress is associated with lower caregiver-child closeness (Harmeyer et al., 2016) and higher caregiver-child conflict (Garcia et al., 2017). Studies suggested that parents with higher parenting stress are more likely to use maladaptive emotion-focused coping strategies such as loss of control or hostility toward children (Dabrowska & Pisula, 2010), which adversely influence the caregiver-child relationship (Dixon, Graber, & Brooks-Gunn, 2008; Wang et al., 2017). Because of the interdependence of caregivers in one family, mothers' and grandmothers' parenting stress may be correlated with each other's relationship with children. One study has shown that mother's parenting stress is negatively associated with father-child communication (Ponnet et al., 2013) and another study found that mother's perception of grandmother's interaction with children could influence the grandmother-child relationship (Hakoyama & MaloneBeach, 2017).

Parenting stress may mediate the links between depressive symptoms and caregiver-child relationship. Studies have demonstrated that depressed individuals are more likely to have negative thinking than nondepressed individuals (Joormann, 2009). Individuals with depressive symptoms tend to consider stressors as threats instead of challenges, which may cause them to experience higher levels of stress (Suls, 2001). Thus, depressive symptoms are thought to contribute to more parenting stress (Misri et al., 2010). Specifically, depressed caregivers are more likely to perceive their children as difficult, consider their interactions with children as dysfunctional, and feel distressed as a parent (Thomason et al., 2014), which in turn decreases the quality of the caregiver-child relationship (Garcia et al., 2017; Harmeyer et al., 2016). Caregivers' parenting stress may also mediate the relation between their partner's depressive symptoms and their own relationship with children. One caregiver's depressive symptoms could be a burden for another caregiver, which may increase the parenting stress. Studies have demonstrated that two caregivers' depressive symptoms can reciprocally influence parenting stress of each other (Le et al., 2017) and then influence their relationship with the children (Thomason et al., 2014).

The Actor-Partner Interdependence Mediation Model (APIMeM; Ledermann, Macho, & Kenny, 2011) provides a theoretical foundation to understand mediating effects in a dyadic context, for example, of two family members. As an extension of the Actor-Partner Interdependence Model (APIM; Kenny, Kashy, & Cook, 2006), APIMeM allows examination of the effect of individuals' own characteristics on their own outcomes (actor effect, e.g., grandmothers' depressive symptoms predict their own parenting stress), as well as the mutual influences between individuals in a dyad (partner effect, e.g., mothers' and grandmothers' depressive symptoms reciprocally influenced one another).

It is important to understand the influence of two female caregivers, both mothers and grandmothers, on child development in three-generation households. Considering the differences in caregiving responsibility and parenting style, the association between depressive symptoms and caregiver-child relationship through parenting stress may vary across generations. For example, in Chinese three-generation households, typically mothers take responsibility to educate their children, whereas grandmothers assume responsibility related to promotion of children's physical health such as cooking and cleaning (Xiao,

2016). In addition, studies showed that grandmothers tend to be permissive and spoil their grandchildren (Song et al., 2016), whereas mothers tend to be stricter with their children than grandmothers (Wang & Chen, 2018). Grandmothers' involvement may create challenges related to parenting for all caregivers in the household. Studies have demonstrated that parenting conflict between parents and grandparents is common in three-generation families (Li, Wang, & Zhu, 2015). Grandparents are more likely to spoil children (Song et al., 2016), which may in turn make children more difficult to raise (Liu, Li, Lin, & Fan, 2015). With these stressors, the association between depressive symptoms and parenting stress may be more pronounced in three-generation households.

The Present Study

The aim of the current study was to examine the mediating role of parenting stress on the associations between mothers' and grandmothers' depressive symptoms and their relationships with children in a dyadic context and test generational differences in these associations (see Figure 1). Based on the family systems theory and previous studies, we proposed four hypotheses:

Hypothesis 1: For both mothers and grandmothers, depressive symptoms would be negatively associated with their own (H1a) and their partners' (H1b) closeness with children and positively related to their own (H1c) and their partners' (H1d) conflict with children.

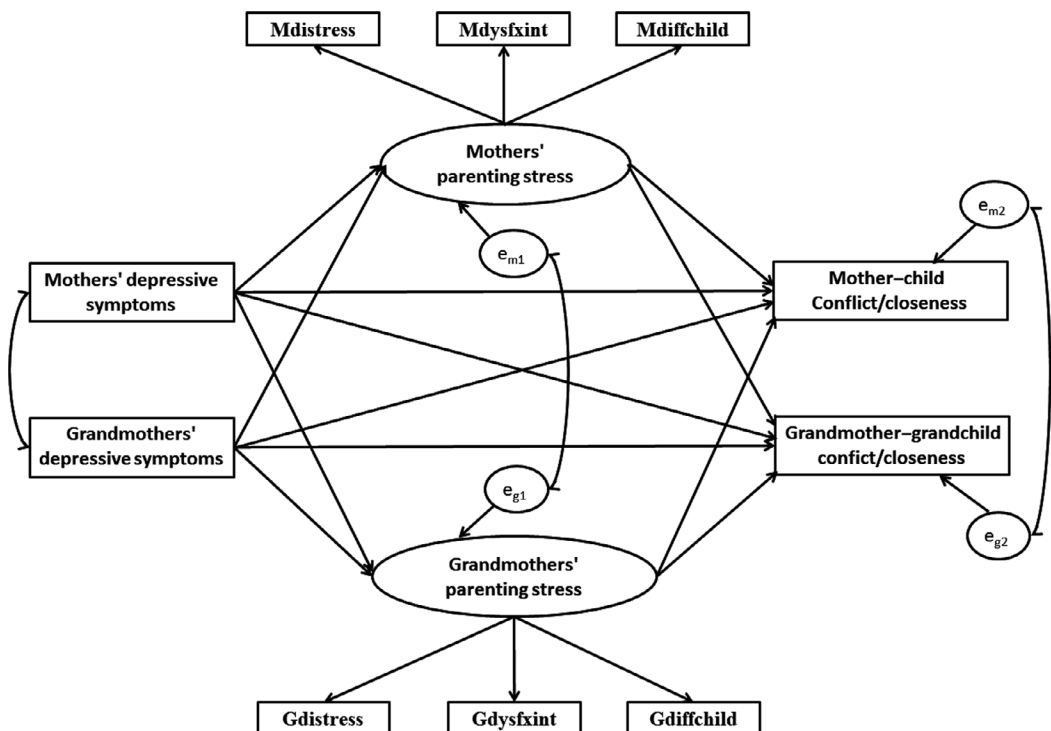


FIGURE 1. Hypothesized relations among mothers' and grandmothers' depressive symptoms, parenting stress and their relationships with children. Mdystress = Mother's report of parental distress.

Mdysfint = Mother's report of caregiver-child dysfunctional interaction. Mdiffchild = Mother's report of difficult child. Gdistress = Grandmother's report of parental distress. Gdysfint = Grandmother's report of caregiver-child dysfunctional interaction. Gdiffchild = Grandmother's report of difficult child.

Hypothesis 2: For both mothers and grandmothers, we hypothesized that parenting stress would be positively associated with one's own (H2a) and one's partner's (H2b) conflict with children and negatively related to one's own (H2c) and one's partner's (H2c) closeness with children.

Hypothesis 3: For both mothers and grandmothers, we hypothesized that mothers' and grandmothers' parenting stress would mediate the effects of depressive symptoms on their own (H3a) and their partners' (H3c) conflict and closeness with children.

Hypothesis 4: The association between mothers' parenting stress and mother-child relationship would be stronger than the association between grandmothers' parenting stress and grandmother-child relationship.

METHOD

Participants and Sample Procedure

We used questionnaire data from a study of three-generation households. The participants were recruited from four elementary schools in Beijing, China, during 2016 and 2017. With permission from the principals of each primary school, the class teachers helped distribute envelopes that contained the invitation letters, informed consent, and screening questionnaires to the students in their classes. We invited each child to take the envelope to their caregivers. Screening questionnaires included demographic information related to three-generation households. Both children and their parents who were willing to participate would complete the screening questionnaires. Inclusion criteria of a three-generation family were that (1) grandmothers were engaged in raising their grandchildren for at least half of their grandchildren's lives, (2) grandmothers were caring for grandchildren in the past year, (3) intact families with two biological parents and at least one grandmother. A total of 192 three-generation families were screened. Mother-grandmother dyads in which only one caregiver completed the questionnaires or had missing data over 50% in this study were excluded ($n = 56$), which resulted in the final sample of 136 mother-grandmother dyads.

The participating caregivers had at least one child aged from 7 to 12 ($M = 9.24$, $SD = 1.41$). Of the children, 66 were boys (48.5%) and 70 were girls (51.5%). 52.94% of the participating grandmothers were paternal grandmothers, 41.18% of the participating grandmothers were maternal grandmothers and 5.88% of the participating grandmothers did not answer the question. The average age for mothers and grandmothers was 36.36 years ($SD = 10.58$) and 63.99 years ($SD = 32.69$), respectively. As to education level, 3.68% of the mothers had a master's degree or above, 38.97% had a bachelor's degree, 26.47% had a junior college diploma, 24.26% had a high school diploma, and 6.62% had a middle school diploma. For grandmothers, 1.47% of the grandmothers had a bachelor's degree, 5.88% had a junior college diploma, 21.32% had a high school diploma, 45.59% had a middle school diploma, 20.59% had an elementary school diploma, and 5.15% (seven grandmothers) did not answer this question. As for family income, the individual average monthly income in Beijing is 8,467 Chinese yuan. In the current sample, 6.62% of families had more than 30,000 Chinese yuan, 54.41% had 10,001–30,000 Chinese yuan, 27.94% had 5,001–10,000 Chinese yuan, 8.09% had 2,001–5,000 Chinese yuan, 0.7% had less than 2,000 Chinese yuan, and 2.21% (3 families) did not answer this question.

Survey Procedure

After parents and children signed informed consents, students from the selected families would take home additional questionnaires that included measures related to depressive symptoms, parenting stress, and relationship with children. Questionnaires were

clearly labeled to distinguish the mothers' and grandmothers' versions. Mothers and grandmothers were required to complete their questionnaires alone. Grandmothers who had difficulty completing the questionnaires independently were invited to the laboratory to fill out the questionnaires under the guidance of research assistants. After mothers and grandmothers completed the questionnaires, children took the questionnaires back to their class teachers within one week. The participating families received a gift to compensate them for their time. The research protocol was approved by the Institutional Review Board of the Institute of Psychology, Beijing Normal University.

Measures

Depressive symptoms

Mothers and grandmothers reported their depressive symptoms by the Center for Epidemiological Studies-Depression (CES-D) scale (Radloff, 1977). The CES-D is a 20-item scale that assesses how often a person experienced symptoms related to depression such as depressed mood, guilty or worthless feelings, helpless or hopeless feelings, and loss of appetite in the last week. CES-D has been demonstrated to be valid and reliable for measuring depressive symptoms in Chinese samples (Zhang et al., 2010). Sample items include "I felt depressed." Mothers and grandmothers reported their own depressive symptoms using the 4-point Likert scale ranged from 0 (*rarely or none of the time*) to 3 (*most or all of the time*). Scores of each item were summed. Total scores had a range from 0 to 60, with higher scores indicating more depressive symptoms. In the current study, Cronbach's alpha of the CES-D scale was .83 for mothers and .81 for grandmothers.

Parenting stress

Mothers and grandmothers reported their perceived levels of parenting stress using the Parenting Stress Index Short Form (PSI-SF; Abidin, 1995). PSI-SF is a 36-item scale with three subscales (i.e., Parental Distress, Difficult Child, and Parent-Child Dysfunctional Interaction) and each subscale contains 12 items. The Chinese version of PSI-SF has shown good reliability and validity (Yeh, Chen, Li, & Chuang, 2001). The Parental Distress subscale measured mothers' and grandmothers' perception of distress evoked by interpersonal factors such as conflict with family members and life restrictions resulting from the demands of raising a child (e.g., "I feel trapped by my responsibilities as a parent"). In this study, Cronbach's α of parental distress subscale was .86 for mothers and .89 for grandmothers. The Difficult Child subscale measured mothers' and grandmothers' perceptions of how difficult the child was (e.g., "I feel that my child is very moody and easily upset"). Cronbach's α of this subscale was .86 for mothers and .85 for grandmothers. The Parent-Child Dysfunctional Interaction subscale measured mothers' and grandmothers' perceptions of the extent to which their interactions with the child were dysfunctional (e.g., "My child smiles at me much less than I expected"). Cronbach's α of this subscale was .89 for mothers and .89 for grandmothers. Items were scored on this 5-point scale (1 = strongly disagree to 5 = strongly agree). Scores were summed across items within each subscale, with higher scores indicating higher level of parenting stress.

Mother-child and grandmother-child relationship

The Child-Parent Relationship Scale (CPRS; Pianta, 1992) was used to measure mothers' and grandmothers' perceptions of their relationship with children. The original scale contains 30 items. The Chinese version of CPRS includes 26 items (four items had low factor loading), and has previously demonstrated acceptable reliability and validity (Zhang, Chen, Zhang, Zhou, & Wu, 2008). Mothers and grandmothers rated three domains of their relationships with children using the 5-point scale (1 = not true at all and 5 = always

true). Items measured dimensions of closeness (10 items; e.g., “My child openly shares his/her feelings and experiences with me.”), conflict (12 items; e.g., “My child and I always seem to be struggling with each other.”), and dependency (4 items; “My child is overly dependent on me.”). Similar to previous studies (e.g., Zhang et al., 2008), Cronbach’s α of the dependency subscale in our sample was .50 for mothers and .57 for grandmothers. Thus, only subscales of closeness and conflict were used. Cronbach’s α value of closeness subscales was .72 for mothers and .79 for grandmothers. For the conflict subscales, Cronbach’s α was .86 and .89 for mothers and grandmothers, respectively.

Data Analyses Plan

We started by conducting missing data analysis using SPSS 19.0. The percentage of missing data ranged between 0% and 23.3% and between 0% and 29.1% for mothers and grandmothers, respectively. Little’s MCAR test for mothers was not significant: $\chi^2(1495) = 1,524.02, p = .295$, suggesting that the variables were missing completely at random. But Little’s MCAR test was significant for grandmothers: $\chi^2(4004) = 4,196.50, p = .017$, suggesting that the variables were not missing completely at random. Further examination of *t* tests showed that missing data for grandmothers was predicted by other variables in the model. Specifically, grandmothers with higher levels of conflict with children were more likely to have missing data. Thus, the data that were missing at random, in other words, could be predicted by variables in the model. We used the full-information maximum likelihood (FIML) method to account for missing data in Mplus 7.11 (Acock, 2005).

We employed the APIMeM (Ledermann et al., 2011) to examine relations among depressive symptoms, parenting stress, and mother/grandmother–child relationships in a mother–grandmother dyadic context. To evaluate model fit, several parameters such as the chi-square statistic, the Tucker–Lewis index (TLI), the comparative fit index (CFI), and the root-mean-square error of approximation (RMSEA) were used. Nonsignificant chi-square value, the TLI/CFI greater than or equal to .95, and the RMSEA less than or equal to .06 would indicate a good fit (Hu & Bentler, 1999). The depressive symptoms variable was positively skewed (skewness = 1.24 for mothers and skewness = 0.87 for grandmothers). Grandmothers’ closeness with children was negatively skewed (skewness = -0.91). Given non-normality of the variables, a maximum likelihood estimator with robust standard errors (MLR) was adopted as the estimating method. We specified mothers’ and grandmothers’ depressive symptoms as predictors, parenting stress as mediators, and mother–child and grandmother–child conflict or closeness as outcome variables (respectively) in the APIMeM model. Child gender (0 = *boys*, 1 = *girls*), mothers’ age, and mothers’ education level (1 = *elementary school diploma*, 6 = *master’s degree or above*) were included as covariates. We also conducted Wald tests to examine whether each actor and partner pathway differed between grandmothers and mothers.

RESULTS

Preliminary Analyses

Means, standard deviations, and correlations among the variables for mothers and grandmothers are presented in Table 1.

For both mothers’ and grandmothers’ reports, depressive symptoms were positively related to their own and their partners’ perceptions of the parenting stress. Mothers’ and grandmothers’ higher levels of depressive symptoms were associated with higher levels of their own and their partners’ perceptions of conflict with children. On the contrary, mothers’ and grandmothers’ depressive symptoms were negatively correlated to less of their

TABLE 1

Descriptive Data Correlations Between Demographic and Observed Variables

	1	2	3	4	5	6	7	8	9	10
1 Mdistress	1									
2 Mdysfxint	.60***	—								
3 Mdiffchild	.52***	.73***	—							
4 Mstress	.82***	.91***	.87***	—						
5 Gdistress	.28**	.20*	.29**	.30**	—					
6 Gdysfxint	.28**	.39***	.38***	.43***	.67***	—				
7 Gdiffchild	.26**	.36***	.52***	.45***	.52***	.66***	—			
8 Gstress	.33***	.37***	.44***	.44***	.86***	.89***	.84***	—		
9 Mcloseness	-.29**	-.56***	-.38***		-.47***	-.16 [†]	-.23**	-.20*	-.18	—
10 Gcloseness	-.14	-.15	-.18	-.20*	-.06	-.32***	-.25**	-.26**	.11	—
11 Mconflict	.49***	.66***	.67***	.69***	.22*	.23*	.41***	.34***	-.34***	-.12
12 Gconflict	.28**	.35***	.47***	.44***	.56***	.65***	.73***	.74***	-.24**	-.17
13 Mdepre	.49***	.46***	.36***	.49***	.17 [†]	.27**	.23*	.24*	-.28**	-.24**
14 Gdepre	.33***	.31**	.36***	.37***	.47***	.47***	.44***	.56***	-.10	-.29**
15 Cgender	.07	-.04	-.07	-.01	-.14	-.11	-.12	-.20*	.28**	.04
16 Cage	-.03	.09	.06	.09	-.01	.03	-.04	-.01	-.13	-.06
17 Mage	.010	-.09	-.05	-.03	.12	.04	.01	.10	.09	.20*
18 Medu	-.23**	-.20*	-.19*	-.23*	.08	-.04	-.14	-.06	.16 [†]	.16 [†]
19 Gage	.07	-.02	-.02	-.04	.10	.16 [†]	-.06	.09	.04	.09
20 Gedu	-.02	-.05	-.04	-.01	-.16 [†]	-.17 [†]	-.08	-.14	.08	.08
21 Income	-.34***	-.24**	-.05	-.24**	-.11	-.05	-.04	-.13	.16 [†]	.08
22 BO	.08	.00	.02	.04	-.10	-.08	-.12	-.12	.01	-.09
23 Nsib	-.02	.10	.04	.04	-.19 [†]	-.02	-.02	-.17	-.17 [†]	-.10
<i>M</i>	3.89	25.50	29.24	85.43	28.69	24.29	27.71	79.32	39.52	39.12
<i>SD</i>	7.60	7.50	7.62	19.32	8.58	7.52	7.89	2.33	4.56	5.78

Note. BO = birth order; C = child's; Depre = depressive symptoms; Edu = education; G = grandmother's; M = mother's; Nsib = sibling number

[†] $p < .1$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

own closeness with children. In addition, mothers' and grandmothers' reports of parenting stress were positively correlated to their own and their partners' perceptions of the conflict with children and negatively related to their own and their partners' perceptions of the closeness with children. Child gender was correlated to mother-child closeness but not grandmother-child closeness. Mothers reported higher levels of closeness with girls than with boys. Higher levels of maternal education were related to lower levels of conflict with children reported by mothers and grandmothers. Moreover, mothers' age was positively associated with grandmothers' closeness with children. Higher levels of monthly family income were related to lower levels of conflict with children for mothers but not for grandmothers. Thus, children's gender, mothers' age, and mothers' education level were examined as covariates in the subsequent analyses.

Actor-Partner Interdependence Mediation Model

Closeness with children

When closeness with children was treated as the outcome variable (see Figure 2), the freely estimated APIMeM demonstrated an acceptable fit to the data: $\chi^2(40) = 66.65$, $p < .01$, RMSEA = .070, CFI = .937, TLI = .906. Next, the Wald test showed that one actor path from parenting stress to their own caregiver-child closeness was significantly

11	12	13	14	15	16	17	18	19	20	21	22	23
—												
.36***	—											
.34***	.20*	—										
.33***	.46***	.24*	—									
.02	.02	.05	.12	—								
.06	.02	.06	.06	-.14	—							
-.14	-.09	.09	-.05	.00	.29**	—						
-.29***	-.18*	-.16*	-.18*	.06	-.29**	.18*	—					
.05	-.03	.03	.02	.08	.14	.56***	.14	—				
-.08	-.16+	.08	-.09	-.02	-.11	.10	.09	.05	—			
-.23**	-.10	-.21*	-.26**	-.07	-.06	-.08	.30***	-.05	-.07	—		
-.06	-.09	.13	-.08	-.01	.19*	.06	-.19*	-.06	.05	.07	—	
-.01	.05	-.04	.00	.12	.09	-.17+	-.26**	-.13	-.02	.03	.29**	—
26.32	24.44	9.50	8.57	0.51	9.24	36.36	4.09	63.99	2.18	3.59	1.01	0.20
7.59	8.21	7.12	6.56	0.25	1.41	1.58	1.04	320.69	0.80	0.59	0.01	0.16

different between mothers and grandmothers, $\chi^2(1) = 4.07, p < .05$. The association between mothers' parenting stress and mother-child closeness was stronger than the association between grandmothers' parenting stress and grandmother-child closeness (Wald Test $\chi^2(1) = 4.07, p < .05$).

Mothers' and grandmothers' depressive symptoms were not directly related to their own closeness with children ($\beta = -.01, p = .905$; $\beta = -.15, p = .214$, for mothers and grandmothers, respectively). Mothers' depressive symptoms were marginally related to grandmothers' closeness with children ($\beta = -.23, p = .052$) while grandmothers' depressive symptoms were not related to mothers' closeness with children ($\beta = .07, p = .536$). Mothers' and grandmothers' depressive symptoms were significantly related to their own parenting stress ($\beta = .45, p < .001$; $\beta = .50, p < .001$, respectively). Mothers' depressive symptoms were significantly related to grandmothers' parenting stress ($\beta = .19, p < .05$) and grandmothers' depressive symptoms were significantly related to mothers' parenting stress ($\beta = .29, p < .01$). The association between mothers' parenting stress and mother-child closeness was significant ($\beta = -.58, p < .001$) while the association between grandmothers' parenting stress and grandmother-grandchild closeness was not significant ($\beta = -.21, p = .094$). Mediation analyses (see Table 2) showed that the association between mothers' depressive symptoms and their own perception of closeness with children was mediated by their own report of parenting stress ($\beta = -.26, p < .001$). However,

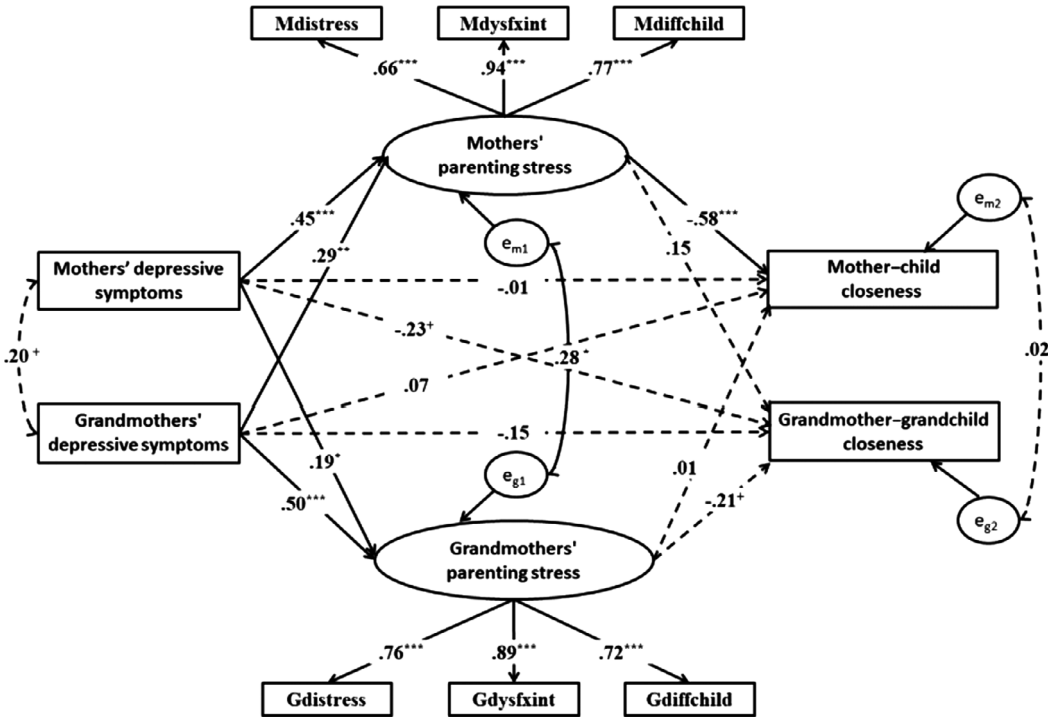


FIGURE 2. Parenting stress as mediators of the links between depressive symptoms and caregiver-child closeness. Twelve observed variables including controlled variables are analyzed in this model. Demographic variables such as children’s gender and mothers’ age are controlled (not shown in this model). Fifty free parameters including 20 weights, four covariances, 14 variances, four means, and eight intercepts are estimated. Dotted lines represent insignificant pathways. ⁺ $p < .1$; * $p < .05$; ** $p < .01$; *** $p < .001$.

the association between grandmothers’ depressive symptoms and their own perception of closeness with grandchildren was not mediated by their own report of parenting stress ($\beta = -.11, p = .107$). For the partner effect, the relation between grandmothers’ depressive symptoms and mothers’ closeness with children was mediated by mothers’ parenting stress ($\beta = -.17, p < .05$). But the relation between mothers’ depressive symptoms and grandmothers’ closeness with children was not mediated by grandmothers’ parenting stress ($\beta = -.04, p = .208$) or mothers’ parenting stress ($\beta = .07, p = .245$).

Conflict with children

When conflict with children was treated as an outcome variable (see Figure 3), the freely estimated APIMeM was conducted. The model was an acceptable fit to the data: $\chi^2(56) = 92.43, p < .01, RMSEA = .069, CFI = .940, TLI = .918$. Next, we examined whether the strength of direct pathways (i.e., the actor and partner paths) of grandmothers and mothers are different. The result indicated that no pathway was significantly different between mothers and grandmothers.

Mothers’ and grandmothers’ depressive symptoms were not directly related to their own conflict with children ($\beta = -.07, p = .507, \beta = -.09, p = .407$, respectively). Mothers’ depressive symptoms were not directly related to grandmother-grandchild conflict ($\beta = -.09, p = .227$) and grandmothers’ depressive symptoms were not directly related to mother-child conflict ($\beta = .04, p = .701$). Mothers’ and grandmothers’ depressive symptoms were correlated to their own parenting stress ($\beta = .47, p < .001, \beta = .53, p < .001$,

TABLE 2
Effects for Actor–Partner Interdependence Mediation Models

Effect	Conflict		Closeness	
	β	SE	β	SE
Mdepressive symptoms → Mrelationship with children				
Direct effect	−.08	.11	−.01	.10
Total indirect effect	.37***	.09	−.26***	.07
Mdepres → M parenting stress → Mrelationship with children	.38***	.09	−.26***	.07
Mdepres → G parenting stress → Mrelationship with children	−.01	.02	.003	.02
Gdepressive symptoms → Grelationship with children				
Direct effect	−.09	.11	−.15	.12
Total indirect effect	.47***	.09	−.06	.07
Gdepres → G parenting stress → Grelationship with children	.44***	.09	−.11	.07
Gdepres → M parenting stress → Grelationship with children	.02	.03	.04	.04
Mdepressive symptoms → Grelationship with children				
Direct effect	−.09	.07	−.23 ⁺	.12
Total indirect effect	.19*	.08	.03	.06
Mdepres → G parenting stress → Grelationship with children	.16*	.08	−.04	.03
Mdepres → M parenting stress → Grelationship with children	.04	.05	.07	.06
Gdepressive symptoms → Mrelationship with children				
Direct effect	.04	.09	.07	.11
Total indirect effect	.21*	.10	−.17 ⁺	.09
Gdepres → M parenting stress → Mrelationship with children	.25**	.09	−.17*	.07
Gdepres → G parenting stress → Mrelationship with children	−.04	.05	.01	.06

Note. Depres = depressive symptoms; G = grandmothers reported; M = mothers reported. The standardized coefficients are reported. Results in bold indicate significant coefficients.

⁺*p* < .1.

**p* < .05.

***p* < .01.

****p* < .001.

respectively). Mothers’ depressive symptoms were correlated to grandmothers’ parenting stress ($\beta = .18, p < .05$) and grandmothers’ depressive symptoms were correlated to mothers’ parenting stress ($\beta = .30, p < .01$). Mothers’ and grandmothers’ parenting stress was associated with their own conflict with children ($\beta = .81, p < .001, \beta = .85, p < .001$, respectively). Mothers’ parenting stress was not associated with grandmother–grandchild conflict ($\beta = .07, p = .444$) and grandmothers’ parenting stress was not associated with mother–child conflict ($\beta = -.07, p = .480$). Mediation analyses showed that the association between mothers’ depressive symptoms and their own perception of conflict with children was mediated by their own report of parenting stress ($\beta = .38, p < .001$). Similarly, the association between grandmothers’ depressive symptoms and their own perception of conflict with grandchildren was mediated by their own report of parenting stress ($\beta = .44, p < .001$). For the partner effect, the relation between mothers’ depressive symptoms and grandmothers’ conflict with grandchildren was mediated by grandmothers’ parenting stress ($\beta = .16, p < .05$). The relation between grandmothers’ depressive symptoms and mothers’ conflict with children was mediated by mothers’ parenting stress ($\beta = .25, p < .01$).

DISCUSSION

This study extended prior studies on family relationships in three-generation households by examining the associations between depressive symptoms, parenting stress, and caregiver–child relationship in the mother–grandmother dyadic context. Briefly, we found

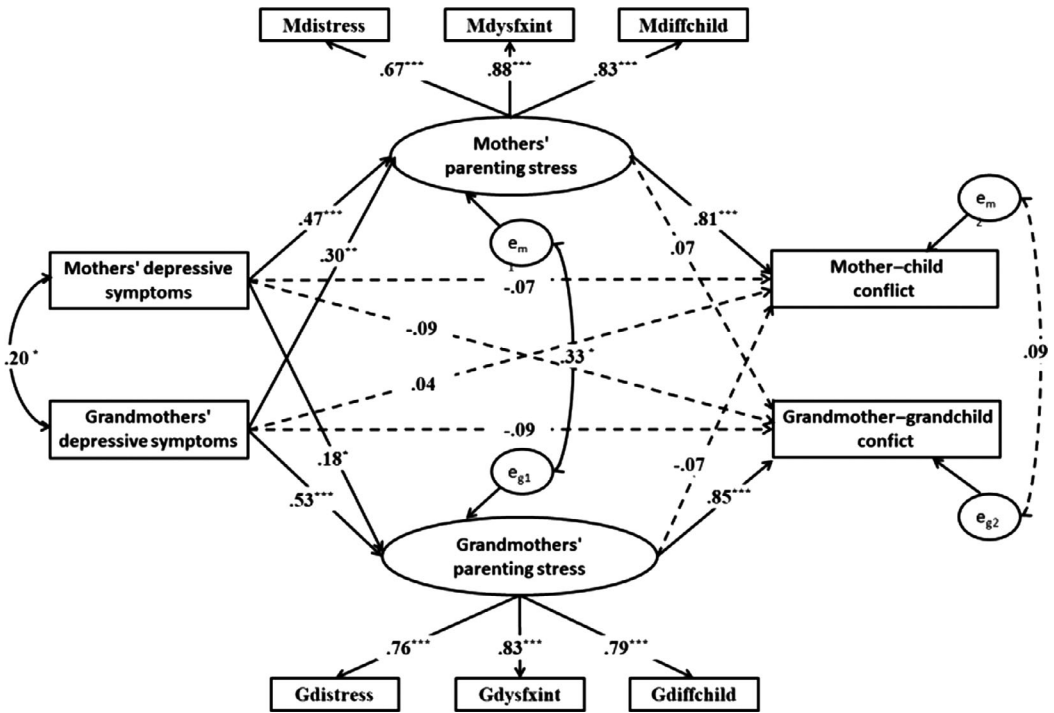


FIGURE 3. Parenting stress as mediators of the links between depressive symptoms and caregiver-child conflict. Fourteen observed variables including controlled variables are analyzed in this model. Fifty-six free parameters including 24 weights, nine covariances, 16 variances, six means, and eight intercepts are estimated. Demographic variables such as mothers' education level are controlled (not shown in this model). Dotted lines represent insignificant pathways. ⁺*p* < .1; **p* < .05; ***p* < .01; ****p* < .001.

significant indirect actor effects as hypothesized: Mothers' parenting stress mediated the association between mothers' depressive symptoms and mother-child conflict/closeness, and grandmothers' parenting stress mediated the associations between grandmothers' depressive symptoms and grandmother-child conflict. Moreover, there were significant indirect partner effects: Mothers' depressive symptoms were related to grandmother-child conflict through grandmothers' parenting stress, and grandmothers' depressive symptoms were related to mother-child conflict/closeness through mothers' parenting stress. With respect to caregiver-child closeness, the indirect partner pathway from partner's depressive symptoms to their own closeness with children through their own parenting stress was significant for mothers but not for grandmothers. Examining the roles that grandmothers and mothers played in caregiver-child relationships in a dyadic context enhances the understanding of family functioning in Chinese three-generation households.

The results of actor mediation analyses indicated that depressive symptoms were indirectly related to caregiver-child conflict through parenting stress, for both mothers and grandmothers. The actor mediating pathways to caregiver-child relationship may provide support for the spillover effect by showing the negative transfer from individual emotion and stress to caregiver-child dyads. Individuals with high levels of depressive symptoms are more likely to have a pessimistic explanatory style (Joormann, 2009), which may transfer to the caregiver-child subsystem and increase parenting stress such as perceiving their children as difficult and having dysfunctional interaction with children (Thomason et al., 2014). Negative bias about their children's difficulty and stress as a parent may

increase negative caregiver–child interaction (Chi & Hinshaw, 2002). Eventually, the high-level parenting stress which includes dysfunctional interaction, difficult child, and stress as a parent could undermine the caregiver–child relationship (Garcia et al., 2017; Harmeyer et al., 2016).

In addition, we also found important partner mediating effects. Mothers' depressive symptoms were indirectly linked to grandmothers' conflict with children through grandmothers' parenting stress, and grandmothers' depressive symptoms were indirectly linked to mothers' conflict/closeness with children through mothers' parenting stress. These indirect partner effects provided support for the crossover effect (Westman & Vinokur, 1998). On the one hand, individuals with high levels of depressive symptoms may create a burden for their family members because of their dysfunctional social interactions with family members or excessive demands of instrumental/emotional support. This burden would increase family members' perceived stress. On the other hand, people have sympathetic reactions to negative emotions of close others and experience similar emotional states of close others (Westman & Vinokur, 1998). Mothers and grandmothers as close family members in Chinese three-generation households might be susceptible to emotional contagion. One's depressive symptoms may increase the other's perceived stress, which, in turn, influences the quality of the caregiver–child relationship.

With respect to caregiver–child closeness, the indirect actor pathway from depressive symptoms to their own closeness with children through their own parenting stress was significant for mothers but not significant for grandmothers. Also, the indirect partner pathway from partner's depressive symptoms to their own closeness with children through their own parenting stress was significant for mothers but not significant for grandmothers. These may be because the association between grandmothers' parenting stress and grandmother–child closeness is weaker than the association between mothers' parenting stress and mother–child closeness. There are two possible reasons for the difference. First, in Chinese three-generation households, the care responsibilities of mothers and grandmothers are different. Because of work stress and work time, mothers usually have limited time to take care of their children. Typically grandmothers bear the responsibility of taking care of their children such as doing laundry for them, cooking for them, and dropping off and picking up from school (Xiao, 2016). Meanwhile, because mothers have better education levels than grandmothers, they take more time to educate their children and help with homework (Xiao, 2016). Mothers' parenting stress may mainly spill over through harsh parenting when educating children. Grandmothers high in parenting stress, however, may exhibit improper interactions with children just through life trifles, which may have limited influence on grandmother–child closeness. Therefore, different strengths of actor pathways from parenting stress to mother–child closeness and grandmother–child closeness may result from the different care responsibilities of mothers and grandmothers. Second, in China, the parenting styles of grandmothers and mothers are different. Typically, grandmothers provided more warmth, care, and love, but less demands than mothers (Song et al., 2016). On the contrary, mothers tend to demonstrate a stricter discipline (Wang & Chen, 2018). Even high in parenting stress, grandmothers may still tend to spoil their grandchildren, which, in turn, produced a limited adverse effect on grandmother–child closeness. However, when mothers experienced high parenting stress, they are more likely to demonstrate harsh parenting to meet the high expectation (Liu & Wang, 2015), which may cause more damage to mother–child closeness. Thus, the different parenting styles of mothers and grandmothers may also be the reason for different strengths of actor pathways from parenting stress to mother–child closeness and grandmother–child closeness.

The results showed that mothers' and grandmothers' parenting stress had different associations with their relationship with children. Specifically, there were generational

differences in actor pathways from parenting stress to their own closeness with children whereas there were no such generational differences for caregiver–child conflict. These discrepancies may suggest differences between caregiver–child closeness and conflict. Caregiver–child conflict, which reflects a relationship marked by negativity and conflict, is heavily influenced by negative caregiver–child interactions (Liang et al., 2013). That is, caregiver–child conflict is sensitive to dysfunctional interactions, one dimension of parenting stress, which might be the reason why both mothers' and grandmothers' parenting stress was highly correlated to their own conflict with children. Caregiver–child closeness, on the other hand, reflects a relationship characterized by warmth and affection. When caregivers perceived high parenting stress, their dysfunctional interactions with children and stress related to the parenting role might also cause damage to caregiver–child closeness, but not as severe as to caregiver–child conflict.

Limitations and Implications

There are several limitations to the present study. First, this study was a cross-sectional study, which means we are unable to know whether or not the relationship among depressive symptoms, parenting stress, and caregiver–child relationship would be reciprocal over time. Future research could conduct a longitudinal design to examine the temporal ordering and direction of effects of depressive symptoms, parenting stress, and caregiver–child relationship. Second, although we measured mothers' and grandmothers' depressive symptoms, parenting stress, and relationship with children, all variables were self-reported and measured by pencil and paper questionnaires, which may contribute to method bias. Future studies may integrate different measurement methods such as behavioral observations, questionnaires, and physiological markers like cortisol to measure individuals' stress levels, which would help reduce shared method variance. Third, this sample was obtained from Beijing, the capital of China, where education competition is fierce and caregivers' parenting stress is relatively high. Therefore, it is not known if these findings could generalize to other populations such as three-generation households in rural areas or other cities. It would be beneficial for future studies on a similar topic to sample a more diverse population in terms of demographic characteristics to determine whether the results of the current finding shown in this sample could generalize to other populations. Fourth, caregiver–child relationship was only reported by caregivers. However, many studies have demonstrated the discrepancy between caregivers' and children's perceptions of their relationship (Pelton, Steele, Chance, & Forehand, 2001). To better understand the actual caregiver–child relationship in three-generation households, future studies may utilize behavioral observations. Fifth, some grandmothers ($N = 22$) who had difficulty completing the questionnaires independently were invited to the lab to fill out the questionnaires under the guidance of experimenters. Compared to those who completed the surveys alone, they had a tendency to report more positive outcomes and less negative outcomes because they may have wanted to leave a good impression. For example, they tended to report less grandmother–child conflict even though the difference was not significant ($t = 1.17, p = .24$). Future studies could figure out how to decrease the discrepancy between grandmothers who completed the questionnaires dependently and independently. Lastly, some studies supported the original four-factor structure of CES-D in Chinese sample (Zhang et al., 2010) while others did not (Zhang & Li, 2012). In the present study, we assumed a four-factor structure model without testing it and future studies can test it again.

Despite these limitations, this study extended previous research by demonstrating that both mothers' and grandmothers' depressive symptoms and parenting stress are associated with caregiver–child relationships in an interdependent pattern. Specifically,

mothers' and grandmothers' depressive symptoms were associated with their own relationship with children through their own parenting stress. Also, mothers' depressive symptoms were linked with grandmother-child relationship through grandmothers' parenting stress, and grandmothers' depressive symptoms were linked with mother-child relationship through mothers' parenting stress. These results highlight the importance of conducting a dyadic analytic framework to understand the mutual influences of female caregivers in three-generation households.

Moreover, the study may provide insights for future intervention programs aimed at improving the caregiver-child relationship, which would contribute to child development. Considering the interdependence between mothers and grandmothers in interacting with children in the family system, family-based intervention including grandmothers, mothers, and children may help improve the caregiver-child relationship (Van Ryzin & Nowicka, 2013). Efforts to attenuate the influence of maternal depressive symptoms on parenting stress may be useful intervention strategies. For example, family therapists could help both mothers and grandmothers with high depressive symptoms learn to develop more positive attributions for perceived difficulties with children (Izadimazidi, Riahi, & Khajeddin, 2015) and intervene in children's problem behaviors at the same time (Kaslow, Broth, Smith, & Collins, 2012). Decreasing the impact of maternal caregivers' depressive symptoms or parenting stress on the caregiver-child subsystem by teaching skills of problem-solving (Stahl et al., 2016) and positive caregiver-child interactions (Shaw, Connell, Dishion, Wilson, & Gardner, 2009; Van Ryzin & Nowicka, 2013) may be also helpful to improve the caregiver-child relationship and then have a positive effect on children's socio-emotional development (Xing, Liang, Yue, & Wang, 2016). Future studies could focus on the female caregivers' relationship with children and the possible effect on children's adjustment in three-generation households.

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