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The Relationship Between Parenting Styles Practiced By Grandparents And Children’s Emotional And Behavioral Problems

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Abstract

Objectives—To examine the relationship between grandparenting styles and grandchildren’s emotions and behaviors, while controlling for parenting styles, and to compare the effects of grandparenting styles and parenting styles on children’s behavioral problems in China.

Methods—A sample of 765 children, with a mean age of 12.02 years (SD = 0.38), participated in this cross-sectional study in Jintan city, Jiangsu province, China. All participants completed the self-report measures of emotions and behaviors, grandparenting styles, and sociodemographic variables.

Results—Results showed that the well-recognized parenting styles (Care, Indifference, Overprotection, and Autonomy), when implemented by grandparents (grandparenting styles) and parents (parenting styles), had different patterns of effects on children’s emotional and behavioral problems. Grandparenting styles, especially grandparental Care and Overprotection, were positively related to emotional and behavioral problems, while parental Care was negatively related to children’s externalizing behaviors.

Conclusions—These results highlight the importance of grandparenting styles in grandchildren’s development. Practitioners working with grandparents and grandchildren need to recognize the complexity of grandparent-grandchild relationships and implement suitable interventions to meet the family needs.

Keywords

Grandparenting style; Parenting style; Internalizing; Externalizing; Child behavior

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Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee from both the University of Pennsylvania and the Ethical Committee for Research at Jintan Hospital in China, as well as with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants included in the study and the guardians in the school.

Grandparenting, which traditionally has been part of the child rearing practice in Asian societies (Jun 2015; Ko and Hank 2014), is becoming more prevalent in the Western societies (Ge and Adesman 2017; Glaser et al. 2013) for reasons such as single-parent families, abandonment, parents' lack of capability and time, or divorce (Jun et al. 2013). Grandparenting is operationally defined as the participation of a grandparent in the upbringing of a child. Due to this growing trend, the impact of grandparental role on grandchildren's development and well-being has gained increasing attention. Historically, the intergenerational relationships of Chinese societies have been shaped by the principles of Confucianism (Yao 2000). The concept of relationalism, or closeness of relationship, is highly valued within interpersonal interactions (Yeh 2010). Relationalism originated mainly in the idea of Ren 仁 (benevolence), Yi 义 (appropriate performance), and Li 礼 (etiquette) as proposed by the Confucians. Filial piety, another Confucianist virtue, includes the elements of respect and obligation, and emphasizes grandparent's roles in educating and raising grandchildren for the betterment of the whole family (Sung 1998). In contemporary China, multigenerational co-residence remains common, and approximately 58% of grandparents are closely involved in raising their grandchildren (Ko and Hank 2014). Due to the one-child policy, raising the "precious single child" appears to have become an "intergenerational joint mission" among parents and grandparents (Goh 2006; Short et al. 2001). Additionally, as the number of dual-income families increases in China, many grandparents provide childcare for their grandchildren on a regular or irregular basis (Kerslake Hendricks 2010). In particular, the grandparents provide custodial or intensive care for grandchildren, such as taking them to school, supervising homework, and providing daily routine care. According to current patterns, grandparents in China may play a more important role in the lives of their grandchildren than ever before.

Previous research has found that grandparents have significant influence on their grandchildren's outcomes concerning their survival, nutrition (Sear et al. 2000), and emotional and behavior problems including internalizing and externalizing behaviors (Pettit et al. 2008; Weissman et al. 2016). However, to our knowledge, a limited number of studies have been conducted to explore the grandparent-grandchild relationships or grandparenting styles measured by specialized tools and its impact on grandchildren's internalizing and externalizing behaviors, or compare the effects of grandparenting and parenting on children's behavior. In the Western context, the United Kingdom Millennium Cohort Study found that infants cared for by their grandparents while their mothers were working in the first 9 months of life showed more behavioral problems (e.g. poor peer relationship) at 3 years old than children cared in nurseries or cared for by nannies (Hansen and Hawkes 2009). Likewise, a longitudinal birth-cohort study in the United States revealed that children raised for almost 6 years by their grandparents, the majority of whom were maternal grandmothers, displayed more externalizing behaviors (e.g. oppositional behavior, less cooperative) and had higher incidents of ADHD diagnosis than children living with their mothers (Pilkauskas and Dunifon 2016). Similar results were found in rural parts of the Hunan Province in China, where children who were on average 12 years old and were living with and being raised by grandparents or relatives reported more emotional symptoms and less prosocial behaviors than children who lived with their biological parents through the self-report SDQ (Fan et al. 2010). However, it is important to note that in

the aforementioned studies, the poorer child adjustment outcomes associated with greater grandparental care might be largely due to parental absences, and not grandparent care per se since the studies did not directly examine the link between grandparenting and grandchildren's emotions and behaviors.

Child behavioral problems, including internalizing and externalizing behavioral problems, are increasingly being viewed as a global public health problem (Belfer 2008; Liu and Wuerker 2005). For example, childhood emotional and behavioral problems are major early indicators of adolescent delinquency, later adult violence, and mood and anxiety disorders (Roza et al. 2003; Tremblay et al. 2004). Therefore, understanding the risk factors underlying child behavioral problems may allow identification and preventative treatment to ameliorate the issues leading to them. For decades, it has been widely known that parenting styles play an important role in children's well-being, and previous studies have shown that parenting styles are associated with children's and adolescents' behavioral problems (Aunola and Nurmi 2005; Hart et al. 2003; Muhtadie et al. 2013). For example, in Finland, Aunola and Nurmi (2005) investigated the combination of mothers' and fathers' parenting styles (i.e., affection, behavioral control, and psychological control) that predicted their children's internalizing and externalizing behavioral problems, and the results showed that a high level of psychological control exercised by mothers combined with high affection levels predicted an increase in the levels of both internalizing and externalizing behavioral problems among children. Moreover, Querido et al. (2002) showed that authoritative parenting style practiced by African American female caregivers was the most predictive of fewer child behavioral problems among authoritarian, authoritative and permissive parenting styles. In Japan, high paternal Overprotection, and low maternal Care and Overprotection were positively associated to child aggression and delinquency (Hiramura et al. 2010). Similarly, parental Indifference and Over-protection were negatively linked to self-regulation in Chinese adolescents (Ngai et al. 2018). Another study in Hong Kong found that paternal Authoritarianism was associated with lower total delinquency, while paternal Protectiveness was associated with higher total delinquency in male adolescents and young adults (Cheng 2014).

To date, different tools have been designed and utilized to assess parenting styles. One of these tools is the Parental Bonding Instrument (PBI; Parker et al. 1979). It is well established and has been used to measure parenting styles all over the world (Fentz et al. 2011; Li et al. 2016; McKinney et al. 2011). The PBI is a child-report instrument scored to capture four parenting styles: (i) Care (e.g. was affectionate to me, could make me feel better when I was upset); (ii) Indifference (e.g. seemed emotionally cold to me, did not seem to understand what I needed or wanted); (iii) Over-protection (e.g. tried to control everything I did, invaded my privacy); and (iv) Autonomy (e.g. Let me decide things for myself, Gave me as much freedom as I wanted). The Chinese version of the PBI has been validated and has good reliability (Li et al. 2016; Ngai et al. 2018). In terms of grandparenting style, a previous study successfully used the PBI in testing both parenting and grandparenting styles in China (Li et al. 2016). The researchers found that parental bonding was positively linked to grandparental bonding. Furthermore, several sociodemographic factors such as gender, being the only child, mother's occupation, and parental marital status were associated to parental and grandparental bonding (Li et al. 2016). Moreover, studies have indicated that the parent–

child relationship quality is related to the grandparent–grandchild relationship (Brown 2003; Monserud 2008; Mueller and Elder 2003). The closer the bond between a parent and his or her own parent, the closer the grandparent-grandchild relationship (Monserud 2008). This may be because grandparents who have closer ties with their child are more likely to have some involvement with their grandchild. A strong relationship between a grandparent and a grandchild can be explained by the middle generation's effort in involving grandparent in their children's life (Mueller and Elder 2003). However, little is known about parenting styles practiced by grandparents specifically (grandparenting styles) and their relationship to grandchildren's emotional and behavioral problems.

Grandparents in China are increasingly playing a greater role in the upbringing of their grandchildren, this study will use a Chinese sample to test the hypothesis that grandparenting styles could relate to children's emotional and behavioral problems. We aimed to control parenting styles while testing the relationship between grandparenting styles and grandchildren' emotional and behavioral problems. This approach may also help us find patterns in the different relationships between parenting and grandparenting styles, and grandchildren's emotional and behavioral problems.

Method

Participants

From 2011 to 2013, 765 children in Grade 4–6, with a mean age of 12.02 years ($SD = 0.38$, ranging from 11 to 14), participated in a cross-sectional questionnaire survey in Jintan city, Jiangsu province, China. The participants consisted of 401 males (52.4%) and 364 females (47.6%), and most participants reported that they had no siblings (82.7%). Being informed by their parents, children reported that their mean age during their grandparents' first involvement was 1.61 years ($SD = 1.57$, ranging from 0 to 10), and the results indicated that 89.4% of grandparents were involved in taking care of their grandchildren during the children's infant stage (1–3 years). The grandparents' rearing time lasted a mean 6.41 years ($SD = 3.64$, ranging from 1 to 14). Altogether, the current study is part of an ongoing longitudinal cohort study and it is a school-based sample. Detailed information on the Jintan Cohort Profile, including subjects, recruitment, and procedure, has been described elsewhere (Liu et al. 2015; Liu et al. 2011; Liu et al. 2010). Children who reported being reared by both parents and grandparents simultaneously, living with both grandparents and parents, or being reared by grandparents while parents worked were recruited in this study, with a 93.5% response rate in recruitment.

Procedure

All the data was collected in the classroom during individual study time, with the permission of the school. The instruments used in this study were self-administered by children, with research assistants on-site to assist any children who needed help completing the questionnaires. Written consent from 765 children and their parents were obtained prior to the initiation of the study. Institutional Review Board approval was obtained from both the University of Pennsylvania and the Ethical Committee for Research at Jintan Hospital in China.

Measures

Children's emotions and behaviors—Children's emotions and behaviors including internalizing, externalizing and total behaviors were assessed by children's self-ratings with the Youth Self Report (YSR). The YSR is a measure commonly used to assess behavioral problems in children and adolescents, and its validity and reliability have been extensively documented (Achenbach and Rescorla 2001). The scale consists of 112 items that are scored on a 3-point scale: "Not true" (score = 0), "Somewhat or sometimes true" (score = 1), and "Very true or often true" (score = 2). The Chinese version of the YSR has been validated (Leung et al. 2006) and the scoring methods were consistent with the original scale. Standardized T scores were calculated from raw scores. The YSR allows the examination of two behavioral problems: internalizing behavioral problems and externalizing behavioral problems. Specifically, in this study internalizing behaviors were assessed by the following subscales: anxious/depressed (13 items, $\alpha = 0.65$), withdrawn (8 items, $\alpha = 0.78$), and somatic complaints (11 items, $\alpha = 0.65$). Externalizing problems were assessed with rule-breaking behavior (17 items, $\alpha = 0.85$), and aggressive behavior (18 items, $\alpha = 0.89$). The total score is the sum score of all 112 items including items of internalizing, externalizing and remaining items, with a higher score indicating more problems. In this study both internalizing and externalizing behavioral problems were used in the analysis. Normalized T scores, i.e., the ratio of the deviation of behavior score from the population mean to its standard deviation, were calculated from raw scores compared to the scores of a Chinese normative sample (Achenbach and Rescorla 2000; Liu et al. 2011). Children who have a T score ≥ 60 , which represent 83rd percentile of the Chinese norm group, tend to present behavioral problems in the clinical range (Achenbach and Rescorla 2000).

Grandparenting and parenting styles—The Parental Bonding Instrument (PBI) is one of the most widely used instruments that measures parenting styles (Parker et al. 1979). The Chinese version of PBI has been translated and adapted to the Chinese social and cultural context and it has well-established psychometric properties (Liu et al. 2011). Moreover, it has been used to measure both parenting and grandparenting styles (Li et al. 2016). In the current study, we also used the Chinese version of PBI to test four parenting and grandparenting styles (Care, Indifference, Overprotection, and Autonomy). The Chinese version of the PBI, consistent with the original scale, was a child-report, Likert-type (0 = very unlikely to 3 = very likely) instrument that contains 24 items (item 13 of the original PBI was disregarded because it cross-loaded on Care and Overprotection factors in the analysis) (Liu et al. 2011). Children reported their perceived relationships with parents and grandparents using the same PBI scale. Each item on the PBI is generic and measures the styles of parenting or grandparenting (e.g. "Made me feel I wasn't wanted", "Let me decide things for myself"). The total score of each style (Care, Indifference, Overprotection, and Autonomy) was used in the analyses. A higher score in Care and Autonomy indicated a more positive parent-child/grandparent-child relationship, whereas a higher score in Indifference and Overprotection indicated a more negative parent-child/grandparent-child relationship.

Socio-demographic information—Socio-demographic information obtained from the questionnaire included children's age, sex, residence, siblings (if any), grade, as well as

parental marital status, occupation, and education level. Furthermore, the questionnaire asked for the age of children during their grandparents' first involvement and the number of years that grandparents had raised their grandchildren (grandparents' rearing time), and children reported this information by recalling parents or grandparents told them in daily life. All socio-demographic information was used from the baseline study of the China Jintan Child Cohort Study (Liu et al. 2010; Liu et al. 2011), except for children's ages, age of initial contact with grandparents, and grandparents' rearing time tested during the second study wave.

Statistical Analyses

Means, standard deviations (SD), frequencies, and percentages were used to describe the participants' demographic characteristics. A series of one-way ANOVAs and *t* tests were performed to examine the association between socio-demographic factors and children's emotional and behavioral problems, and a *p*-value < 0.01 was considered statistically significant. Pearson correlation coefficients were calculated to test the relationship between children's emotional and behavioral problems, as well as parenting and grandparenting styles. Hierarchical linear analyses were used to examine the association between grandparenting styles or parenting styles and children's emotional and behavioral problems, controlling for socio-demographic factors. The effect size (R^2) was used to compare the effects of parenting and grandparenting styles on children's emotional and behavioral problems. Furthermore, we tested the interactions between grandparents and parents' parenting styles on children's emotional and behavioral problems using the following steps for each style separately. First, grandparental, maternal, and paternal parenting variables were centered; second, the centered variables of grandparental, maternal, and paternal parenting were entered in linear regression model adjusting for children's sex, siblings, and grade; finally, two product terms (grandparental parenting style*maternal parenting style and grandparental parenting style*paternal parenting style) were entered in the model to determine the interactive effect of grandparenting and maternal parenting and the interactive effect of grandparenting and paternal parenting. In order to visualize the interactive effects, for each parenting style, the children were quartered into four groups according to their grandparenting levels and the relationship between maternal/paternal parenting and child emotional and behavioral problems were plotted for each group. Statistical analysis was performed using SPSS 13 software (SPSS, Inc., Chicago, IL, USA). A *p*-value < 0.05 was considered statistically significant.

Results

Descriptive Analysis of Grandchildren's Emotional and Behavioral Problems

The descriptive statistical analyses revealed that males displayed more externalizing problems than females ($t = 2.65, p < 0.001$). Children with siblings had more externalizing and total behavioral problems than those without siblings ($ps < 0.01$). The one-way ANOVA results showed that there were significant differences in children's externalizing and total problems among different grade groups ($ps < 0.001$; see Table 1). Moreover, Bonferroni corrected post-hoc comparisons revealed that children in grades 4 and 5 overall had higher externalizing problems than children in grade 6 ($ps < 0.01$ but that there was no significant

difference in externalizing behaviors between grades 4 and 5. However, children in grade 4 had higher total problems than children in grade 5 and grade 6 ($ps < 0.01$), but there was no difference between grade 5 and grade 6 in terms of internalizing and total behavioral problems. No significant relationships existed between children's behavioral problems and other socio-demographic variables. Therefore, in this study, the regression coefficients were adjusted for children's sex, siblings, and grade.

Correlations among Grandparenting and Parenting Styles and Children's Emotional and Behavioral Problems

Through the Pearson Correlation analysis, grandparental Care, Indifference, Overprotection, and Autonomy were significantly positively related to parental Care, Indifference, Overprotection, and Autonomy, respectively ($rs = 0.41 \sim 0.64$, $ps < 0.01$; see Table 2). Both grandparental and parental Indifference and Overprotection were linked to higher children's externalizing, internalizing, and total problems, respectively ($r = 0.12\text{--}0.31$, $ps < 0.01$). More specifically, children who perceived more grandparental and parental Indifference and Overprotection reported more behavioral problems. There was no significant relationship between grandparental Care or Autonomy and children's behavioral problems. However, parental Care was significantly linked to less children's externalizing, internalizing, and total problems, respectively ($rs = -0.21 \sim -0.18$, $ps < 0.01$). Similarly, parental Autonomy was linked to less children's total problems ($rs = -0.13 \sim -0.80$, $ps < 0.05$).

Grandparenting Styles and Grandchildren's Emotional and Behavioral Problems

After adjusting for maternal and paternal parenting styles and socio-demographic factors (children's sex, siblings, and grade), children who perceived more grandparental Care reported significantly more externalizing, internalizing, and total problems, as well as greater levels of anxiety/depression, somatic complaints, thought problems, and aggressive behavior ($\beta = 0.09\text{--}0.13$, $ps < 0.05$; see Table 3). Children who perceived more grandparental Overprotection reported more externalizing, internalizing, and total problems, as well as greater levels of anxiety/depression, social problems, rule-breaking problems, and aggressive behavior ($\beta = 0.10\text{--}0.17$, $ps < 0.05$; see Table 3). Finally, children who perceived more grandparental Autonomy reported an increased level of total behavioral problems, as well as thought and attention problems ($\beta = 0.10\text{--}0.12$, $ps < 0.05$; see Table 3).

Before adjusting for parenting style, children who perceived more grandparental Indifference reported more externalizing, internalizing, and total problems, as well as higher withdrawal, somatic complaints, social and thought problems, attention issues, rule breaking and aggressive behaviors ($\beta = 0.09\text{--}0.17$, $ps < 0.05$; see Table 3). However, when parenting styles were adjusted, no significant relationship was yielded between perceived grandparental Indifference and children's internalizing and externalizing problems.

The Comparison of Effects of Grandparenting and Parenting Styles on Children's Emotional and Behavioral Problems

The adjusted hierarchical linear regression models displayed in Table 4 show a summary of the effect size of parenting styles and grandparenting styles on children's behavioral problems. The results indicated that grandparental Care was related to more grandchildren's

behavioral problems ($\beta = 0.10-0.12$, $ps < 0.05$), while paternal Care were related to less children's behavioral problems ($\beta = -0.12$ to -0.19 , $ps < 0.05$). By comparing the main effect sizes, paternal Care had slightly more effects on children's behavioral problems than both maternal Care and grandparental Care. Grandparental Overprotection had a positively significant effect on grandchildren's behavioral problems ($\beta = 0.14-0.16$, $ps < 0.01$), while parental Over-protection had no significant effect on children's behavioral problems.

There were no significant relationships between grandparental Indifference or Autonomy and children's behavioral problems. However, paternal Indifference had a positive effect on children's internalizing problems ($\beta = 0.22$, $Ps < 0.001$), while maternal Autonomy had a negative effect on children's behavioral problems ($\beta = -0.16$ to -0.11 , $ps < 0.05$). However, the effect sizes were small even if they were statistically significant.

The Interaction Effects of Grandparenting and Parenting styles on Children's Emotional and Behavioral Problems

Results showed that grandparental and maternal Indifference, as well as grandparental and paternal Autonomy, were associated with less children's externalizing, internalizing, and total problems, respectively ($\beta = -0.056 - -0.086$, $ps < 0.05$; see Table 5). The graphic analysis showed that compared with the bottom and middle quartiles, in the top quartile of grandparental Indifference or Autonomy, children who perceived more maternal Indifference or paternal Autonomy displayed less internalizing, externalizing, and total problems, respectively.

Discussion

This study aims to examine the relationship between grandparenting styles and grandchildren's emotional and behavioral problems, while controlling for parenting styles. In our study, grandparents participated in the upbringing of their grandchildren for an average of 6 years. Among these 765 Chinese children, we found that grandparenting styles were significantly associated with children's emotional and behavioral problems, when controlling for parenting styles. More specifically, grandchildren who perceived more grandparental Care and Overprotection reported more emotional and behavioral problems, which provides empirical evidence that supports the previous view that grandparenting plays an important role in children's development (Pettit et al. 2008; Zeng and Xie 2014). This is also consistent with previous research that found a relationship between grandparenting and grandchildren's emotional and behavioral problems. Teachers in Edwards's studies (2006, 2009) perceived that children who were raised by grandparents experienced significantly more emotional and behavioral problems than a comparison group. Researchers also found that 26% of the children who were in the care of relatives (including grandparents) had clinically significant levels of behavioral problems as measured by the Child Behavior Checklist (CBCL) (Dubowitz et al. 1994). The present study expands on previous findings by identifying grandparental Care and Overprotection as potential contributors to child emotional and behavioral problems. Furthermore, in the present study, parental Overprotection and grandparental Overprotection had no significant interaction on children's emotional and behavioral problems, which indicated that grandparental Overprotection,

whether or not children perceived parental overprotection styles, predicted child internalized and externalized problems.

Moreover, in this study, grandparenting styles and parenting styles were related to children's emotional and behavioral problems in different manners. Grandchildren who perceived more grandparental Care reported more internalizing, externalizing, and total problems, whereas children who perceived more parental Care reported less internalizing, externalizing, and total problems. The discrepancy between the associations of grandparental Care and parental Care and children's behavior problems may be explained by the lack of grandparent's understanding on contemporary issues confronting grandchildren and outdated ideas about child development (Hayslip et al. 2017). Previous research found that grandparents caring for a grandchild with emotional or behavioral problems are less responsive to their grandchildren's needs and have less boundary clarity in the parent versus child roles compared to parents in America (Kaminski et al. 2008). However, Grandparent or allocare rearing is common and important in many parts of the world, specifically among rural small-scale societies in sub-Saharan Africa (Fouts and Brookshire 2009; Lamm et al. 2008). Furthermore, caregiving responsibilities may be imposed on grandparents unexpectedly and they could be ill-equipped to address child issues such as tantrums or delinquency. The acceptable behavioral standards and social norms that were appropriate to their own children may no longer be applied to their grandchildren (Bullock 2004).

Interestingly, when comparing the effects of parenting and grandparenting styles on children's emotional and behavioral problems, we found that maternal Indifference was not significantly correlated to children's emotional and behavioral problems. In contrast, father's childrearing seemed to play an important role in predicting children's emotional and behavioral problems, whereby paternal Indifference was linked to increased internalizing and total problems. However, no relationship was found between paternal Overprotection or Autonomy and children's behavioral problems. Fathers have frequently been known to excel in play-oriented activities with their children, and they tend to spend more time than mothers playing with their children (Paquette 2004). Play interactions with fathers produce significant positive reactions from children (Feldman 2003). Previous research (Jia et al. 2012) found that increased father involvement in play was linked to diminished internalizing behavior and greater social competence. On the other hand, fathers who are less attuned to their children's requests or feel emotionally distant from their children can contribute to the manifestation of children's internalizing problems (Jia et al. 2012). Furthermore, fathers may have less motivation to initiate play with their children who are withdrawn. However, father-child attunement was not assessed in the study (Jia et al. 2012). Hence, causal relationship between father-child attunement and children's internalizing problems cannot be drawn.

Independently, the main effect for grandparental and maternal Indifference was not significant for children's internalizing and externalizing but the interaction effect of grandparental and parental Indifference was significant. Such finding supported previous research that found a positive relationship between parental Indifference, such as lack of perceived support and affection, and cognitive, affective and behavioral symptoms of depression in children (Liu 2003). Furthermore, the significant combined effect of

familial Indifference on children's behavioral problems is consistent with the concept of relationalism (Hwang 2000), a strong feature of Chinese societies. Because of the value placed on the maintenance of emotional bonds among family members in China, excessive distance between caretakers and children could be associated with children's internalizing and externalizing problems. Moreover, the interacting effects of grandparenting styles and parenting styles on children's emotional and behavioral problems were examined in this study, and the result showed that there was an interaction effect between grandparental Indifference and maternal Indifference on children's externalizing, internalizing, and total problems. After grandparental Indifference was categorized into quartiles, the graphic analysis showed that in the top quartile of grandparental Indifference, children who perceived more maternal Indifference exhibited less internalizing, externalizing, and total problems. Possible explanations could be that when children are experiencing both maternal and grandparental Indifference, the negative effect of higher level of indifference decreases rather than increases; or that children experiencing both high parental and grandparental Indifference may form better strategies to cope with their situation.

When looking only at parenting practices, neither maternal nor paternal Overprotection was significantly related to children's emotional and behavioral behaviors. However, grandparental Overprotection was significantly associated with higher levels of children internalizing and externalizing behaviors on all dimensions. In a meta-analysis, Hovee et al. (2009) found that parental Overprotection was significantly associated with children delinquency. The relationship between grandparental overprotection and children's internalizing problems may be explained by perceived parental psychological control and emotion regulation of children (Li et al. 2018). Goss and Allan (2009) found that high maternal overprotection was a risk factor for shame beliefs, which suggests that parents who received overprotective parenting tend to feel shameful about themselves. To minimize the feeling of shame, they may develop rejecting or disapproving parenting like psychological control (Mills et al. 2007; Tangney and Dearing 2003), a parenting behavior where parents might manipulate children's emotions to make them to meet their needs and expectations (Rogers et al. 2003). Hence, parents' own upbringing could influence their application of controlling behaviors on their own child. Such parenting behavior might have detrimental effects on the children's ability to regulate emotions, which are often related to several psychopathological symptoms, especially internalizing behaviors (Cui et al. 2014).

In our sample, grandparental Autonomy was linked to increased children's thought and attention problems when controlling for parental Autonomy. However, the interaction effect of grandparental and parental Autonomy was not significant for children's emotional and behavioral problems. This may be that when grandparents were perceived to be giving a lot of freedom to the children, parents were demonstrating extra Care. In addition, maternal Autonomy had a significant effect on children's internalizing, externalizing and total problems, with higher Autonomy associated with fewer problems. This finding is in line with previous research that found maternal autonomy support was associated with less children's internalizing and externalizing behaviors over time (Lunkenheimer et al. 2017). Moreover, in this study, the interacting effects of grandparental and paternal Autonomy were linked to more children's externalizing, internalizing, and total problems. After grandparental Autonomy was categorized into quartiles, the graphic analysis showed

that in the top quartile of grandparental Autonomy, children who perceived more paternal Autonomy reported less internalizing, externalizing, and total problems. This may be that children with both highly autonomous parents and grandparents are more self-regulated. Previous research showed that greater parental autonomy support was linked to higher self-regulation (i.e. effortful control) in adolescence, which in turn predicted less disruptive behaviors (Wong 2008). Effortful control means that one can focus and shift attention, to engage in behaviors one wants to avoid, and to prevent behaviors one wants to engage in (Rothbart and Bates 1998). Parental autonomy also allows children to solve problems independently, and facilitates self-determination and choice in their children.

In this study, we also found that grandparenting styles (Care, Indifference, Overprotection, and Autonomy) were significantly positively associated with parenting styles (Care, Indifference, Overprotection, and Autonomy). Previous studies have found that the quality of the grandparent-grandchild relationship was strongly related to the grandparent-parent bond (Barnett et al. 2010; Breheny et al. 2013). Each dyadic relationship in the family is ingrained within a family system such that one relationship influences and is influenced by other relationships (Cox and Paley 1997). Grandparents' relationships with their grandchildren are embedded within a multigenerational family systems and are dependent on grandparents' relationships with parents (Mueller and Elder 2003) or parents' relationships with their children. Despite the correlation, the relationship between grandparenting and children's behaviors is different from the relationship between parenting and children's behavior. Parental Care correlates with children's internalizing, externalizing, and total problems more strongly than grandparental Care does, which, to our knowledge, is the first study in the field to show this relationship. These results indicate that parents and grandparents share similarities in parenting children, but that the levels of parental and grandparental Care, Indifference, Overprotection, and Autonomy are different. This aligns with the structural family theory that different family members carry out their varying functions within a family unit (Minuchin and Fishman 1981). Family structure, an invisible set of working demands that arranges the ways in which a family communicates, is created over time through patterned family interactions (Minuchin and Fishman 1981). Chinese children are able to perceive the similarities and differences between parenting and grandparenting and behave differently depending on the role of each adult. Such findings also suggest that parents' rearing practices are more strongly associated with children's behavior in comparison to grandparents' rearing practices in China.

Although our study in China showed that all styles of grandparenting were linked to more children's emotional and behavioral problems, the effect size was small. In other countries, grandparenting was found to correlate with enhanced adolescent well-being. For example, in the UK, grandparenting was found to link with fewer emotional problems in adolescents (Attar-Schwartz et al. 2009). Similarly, cohesive grandparent was associated with lower depressive symptoms among American young adults, especially those that were raised in single-parent families (Ruiz and Silverstein 2007). Humans have been portrayed as cooperative childrearsers and rely on non-maternal, otherwise known as allomaternal, investments (Hrdy 2017).

Limitations and Future Research Directions

There are several methodological limitations to this study. First, data collection in this study relied exclusively on children's self-reports, which may be influenced by social desirability, and therefore produce potential report bias. Hence, future studies could include the perspectives of other informants, such as grandparents, parents, and other significant people, in order to comprehensively understand the children's bonding with parents and grandparents, as well as their emotional and behavioral problems. Second, due to the cross-sectional nature of the study design, we cannot infer a causal relationship between parenting/grandparenting styles and behavioral problems. Other factors can also play a role in children's emotional and behavioral problems. For example, grandparental co-residence can increase conflict between grandparents and parents (Black and Nitz 1996) and household crowding, which were associated with poorer socioemotional outcomes in children (Johnson et al. 2008). Furthermore, low grandparental socioeconomic status can result in grandparents' poor psychological well-being, and grandparental stress and depression were found to relate to children's social, emotional and behavioral difficulties (Dunne and Kettler 2008). However in this study, only children's sex, siblings, and grade were controlled for potential confounding in the analysis. Another limitation of this study is the lack of detailed rearing information regarding the nature and time extent of grandparental involvement in these families, and the types of families (e.g. three generations living together or separate, and grandparent-headed household). Future research should examine grandparents' socioeconomic status, age, gender, and current living condition to help understand the application of research findings. Furthermore, the current study was conducted in the Chinese context, which may limit the generalization of the findings to other cultural contexts. Finally, the present study did not include the combination of grandparenting styles. As previous studies have shown, combination effects of different parenting styles on children's internalizing and externalizing behaviors exist (Aunola and Nurmi 2005). Therefore, further studies are needed to explore the combination effects of grandparenting styles on children's well-being in a different context, for example how grandparental Care combined with Indifference, Overprotection, or Autonomy impact children's emotions and behaviors.

Despite the limitations discussed above, this study provides research implications. The study contributes to the science of parenting by exploring the relationship between both grandparenting and parenting styles and children's emotional and behavioral problems in the Chinese culture. While most research focuses on relationships between parenting styles and children's emotional and behavioral problems, this study provides additional evidence that grandparenting styles have certain effects on grandchildren's emotional and behavioral problems. In the future, researchers who examine the relationship between children's psychological health and parenting styles should take into full consideration the role of grandparenting styles.

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Characteristics of children and families, and descriptive statistics of children’s emotional and behavioral problems. (*n* = 765)

Table 1

	<i>n</i> ^a (%)	Externalizing problems		Internalizing problems		Total problems	
		Mean ± SD	t/F	Mean ± SD	t/F	Mean ± SD	t/F
<i>Sex</i>							
Male	401 (52.4)	50.72 ± 10.49	2.65**	49.37 ± 10.00	-1.46	50.27 ± 10.20	1.36
Female	364 (47.6)	48.81 ± 9.23		50.43 ± 9.99		49.30 ± 9.59	
<i>Residence</i>							
Rural	124 (16.2)	49.43 ± 10.19	0.11	51.04 ± 10.27	1.02	50.61 ± 10.28	0.53
Suburban	319 (41.7)	49.89 ± 9.56		49.70 ± 10.22		49.77 ± 10.30	
City	322 (42.1)	49.88 ± 9.95		49.60 ± 9.68		49.54 ± 9.40	
<i>Siblings</i>							
Yes	111 (17.3)	52.59 ± 12.20	3.10**	51.50 ± 11.32	1.93	52.05 ± 12.25	2.65**
No	532 (82.7)	49.32 ± 9.62		49.48 ± 9.76		49.29 ± 9.47	
<i>Grade</i>							
4 th	241 (31.9)	51.92 ± 10.80	22.10***	51.50 ± 10.28	4.57	52.17 ± 10.35	10.02***
5 th	201 (26.6)	51.73 ± 10.86		48.78 ± 9.91		49.23 ± 10.00	
6 th	313 (41.5)	47.07 ± 7.90		49.50 ± 9.81		48.50 ± 9.33	
<i>Parents’ marital status</i>							
Married	628 (97.2)	49.83 ± 10.29	-0.13	49.62 ± 9.94	-1.04	49.58 ± 10.05	-1.18
Divorced/separated	18 (2.8)	50.14 ± 7.98		52.11 ± 12.93		52.42 ± 10.78	
<i>Father’s occupation</i>							
Unemployed	8 (1.4)	48.8 ± 9.21	0.69	48.41 ± 7.46	0.10	49.08 ± 6.66	0.04
Physical work	434 (75.0)	49.87 ± 10.24		49.88 ± 9.95		49.89 ± 9.98	
Professional work	137 (23.6)	50.98 ± 10.08		49.68 ± 10.43		50.06 ± 10.18	
<i>Mother’s occupation</i>							
Unemployed	59 (11.3)	50.47 ± 9.61	0.16	50.32 ± 10.66	0.31	50.45 ± 10.81	0.15
Physical work	313 (60.2)	49.95 ± 10.31		50.12 ± 10.76		49.93 ± 10.38	
Professional work	148 (28.5)	49.61 ± 9.77		49.37 ± 9.41		49.60 ± 9.50	
<i>Father’s education</i>							
Middle school	208 (27.7)	50.82 ± 11.26	1.53	50.71 ± 10.03	1.05	51.18 ± 10.52	2.63

	<i>n</i> ^a (%)	Externalizing problems		Internalizing problems		Total problems	
		Mean ± SD	t/F	Mean ± SD	t/F	Mean ± SD	t/F
High school	215 (28.6)	49.15 ± 9.33		49.58 ± 9.46		49.21 ± 9.01	
College	329 (43.8)	49.74 ± 9.58		49.49 ± 10.40		49.40 ± 10.19	
<i>Mother's education</i>							
Middle school	280 (37.3)	49.33 ± 10.03	0.78	50.04 ± 9.94	0.08	50.00 ± 10.06	0.12
High school	185 (24.6)	49.85 ± 10.26		49.75 ± 9.50		49.54 ± 9.84	
College	286 (38.1)	50.38 ± 9.84		49.74 ± 10.51		49.83 ± 10.04	
<i>Children's mean age of grandparents' first involvement (ys)</i>							
1–3	580 (89.4)	49.58 ± 9.62	–0.02	49.81 ± 9.97	–0.25	49.68 ± 9.81	–0.26
4–11	69 (10.6)	49.60 ± 11.24		50.14 ± 10.06		50.01 ± 10.25	
<i>Grandparents' rearing time (ys)</i>							
1–4	283 (40.0)	50.03 ± 10.01	0.32	50.03 ± 9.80	1.05	49.78 ± 9.57	0.32
5–8	188 (26.5)	49.40 ± 10.27		50.39 ± 10.36		50.14 ± 10.79	
9	237 (33.5)	49.46 ± 9.05		49.08 ± 9.38		49.38 ± 9.18	

^aThe number of children differs across sample characteristics because of missing values.

**

$p < 0.01$,

$p < 0.001$

Correlations among grandparenting and parenting styles and children's emotional and behavioral problems

Table 2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<i>PBI for grandparents</i>															
Care	(0.77)														
Indifference	-0.26**	(0.76)													
Overprotection	-0.05	0.63**	(0.75)												
Autonomy	0.58**	-0.08*	0.05	(0.79)											
<i>PBI for mother</i>															
Care	0.41**	-0.20**	-0.12**	0.25**	(0.82)										
Indifference	-0.19**	0.56**	0.42**	-0.06	-0.43**	(0.76)									
Overprotection	-0.05	0.46**	0.55**	0.02	-0.19**	0.63**	(0.69)								
Autonomy	0.31**	-0.03	-0.01	0.42**	0.59**	-0.20**	-0.1**	(0.83)							
<i>PBI for father</i>															
Care	0.45**	-0.08*	-0.03	0.24**	0.53**	-0.26**	-0.08*	0.39**	(0.82)						
Indifference	-0.13**	0.64**	0.51**	0.02	-0.25**	0.63**	0.53**	-0.09*	-0.35**	(0.76)					
Overprotection	-0.03	0.57**	0.64**	0.02	-0.18**	0.55**	0.67**	-0.09*	-0.07	0.67**	(0.80)				
Autonomy	0.28**	0.04	0.09*	0.47**	0.35**	-0.11**	-0.04	0.60**	0.53**	-0.13**	-0.03	(0.83)			
<i>Behavior problems</i>															
Total problems	-0.03	0.19**	0.27**	0.05	-0.21**	0.24**	0.26**	-0.13**	-0.21**	0.31**	0.28**	-0.08*	(0.82)		
Externalizing problems	-0.05	0.23**	0.28**	0.05	-0.19**	0.25**	0.24**	-0.06	-0.18**	0.30**	0.27**	-0.05	0.85**	(0.87)	
Internalizing problems	-0.02	0.12**	0.21**	0.05	-0.18**	0.17**	0.19**	-0.13**	-0.19**	0.25**	0.23**	-0.07	0.91**	0.62**	(0.73)

Data in the brackets present the coefficient alphas

PBI the Parental Bonding Instrument

* $p < 0.05$,

** $p < 0.01$

Table 3
Hierarchical linear regression models of grandchildren's emotional and behavioral problems^a. (β)

	Care		Indifference		Overprotection		Autonomy	
	Not -controlling for parental Care	Controlling for parental Care	Not -controlling for parental Indifference	Controlling for parental Indifference	Not -controlling for parental Overprotection	Controlling for parental Overprotection	Not -controlling for parental Autonomy	Controlling for parental Autonomy
<i>Syndrome</i>								
Anxious/depressed	0.01	0.13**	0.06	-0.03	0.19***	0.15**	0.012	0.07
Withdraw	-0.11**	0.01	0.15***	0.02	0.19***	0.10	-0.004	0.05
Somatic complaints	-0.002	0.11*	0.12**	-0.03	0.17***	0.08	0.02	0.09
Social problems	-0.02	0.08	0.13**	0.01	0.18***	0.10*	-0.05	0.004
Thought problems	0.001	0.11*	0.09*	-0.05	0.17***	0.10	0.04	0.12*
Attention problems	-0.03	0.09	0.11**	-0.01	0.17***	0.09	-0.001	0.10*
Rule-breaking problems	-0.06	0.04	0.15***	0.03	0.19***	0.11*	-0.01	0.05
Aggressive behavior	-0.01	0.11*	0.16***	0.05	0.22***	0.17**	0.01	0.09
Internalizing problems	-0.03	0.11*	0.12**	-0.02	0.22***	0.14**	0.01	0.09
Externalizing problems	-0.03	0.09*	0.17***	0.04	0.23***	0.16**	0.004	0.08
Total problems	-0.03	0.12**	0.16***	-0.002	0.24***	0.15**	0.01	0.10*

^aThe regression coefficients were adjusted for children's sex, siblings, and grade in first step of the Hierarchical linear regression models

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$

Table 4

The comparison of effects of parenting and grandparenting styles on children's emotional and behavioral problems^a

	Externalizing problems		Internalizing problems		Total problems	
	R ²	Beta	R ²	Beta	R ²	Beta
<i>Care</i>						
Grandparental Care	0.006	0.09*	0.009	0.11*	0.010	0.12**
Maternal Care	0.011	-0.13**	0.010	-0.12*	0.013	-0.14**
Paternal Care	0.017	-0.16**	0.017	-0.16**	0.024	-0.19***
<i>Indifference</i>						
Grandparental Indifference	0.001	0.04	0.000	-0.02	0.000	-0.002
Maternal Indifference	0.002	0.05	0.001	0.04	0.002	0.07
Paternal Indifference	0.018	0.19	0.023	0.22***	0.025	0.23***
<i>Overprotection</i>						
Grandparental Overprotection	0.015	0.16**	0.011	0.14**	0.013	0.15**
Maternal Overprotection	0.001	0.05	0.003	0.08	0.004	0.09
Paternal Overprotection	0.002	0.07	0.004	0.09	0.003	0.09
<i>Autonomy</i>						
Grandparental Autonomy	0.005	0.08	0.005	0.09	0.007	0.10*
Maternal Autonomy	0.008	-0.11*	0.016	-0.16**	0.017	-0.17**
Paternal Autonomy	0.002	-0.06	0.000	-0.01	0.001	-0.04

Beta Standardized Beta, R² R square change

^aThe regression coefficients were adjusted for children's sex, siblings, and grade, and parenting or grandparenting styles; R² is the main effect size of parenting or grandparenting styles on children's behavioral problems controlling for other variables, e.g., R² of grandparental Care was the results that we have controlled for sociodemographic variables, maternal Care, and paternal Care, in the Hierarchical linear regression model

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$

Table 5

Interaction effects of grandparenting styles and parenting styles on children's emotional and behavioral problems^a

		Externalizing problems		Internalizing problems		Total problems	
		β	<i>p</i> value	β	<i>p</i> value	β	<i>p</i> value
Care	Grandparental	0.058	0.211	0.086	0.072	0.086	0.064
	Maternal	-0.144	0.002	-0.127	0.009	-0.148	0.002
	Paternal	-0.154	0.001	-0.162	0.001	-0.187	0.000
	Grandparental*Maternal	-0.066	0.187	-0.002	0.962	-0.030	0.549
	Grandparental*Paternal	-0.044	0.369	-0.077	0.125	-0.072	0.148
Indifference	Grandparental	0.065	0.211	0.013	0.810	0.036	0.494
	Maternal	0.098	0.062	0.111	0.042	0.134	0.012
	Paternal	0.139	0.025	0.133	0.038	0.157	0.012
	Grandparental*Maternal	-0.127	0.011	-0.189	0.000	-0.196	0.000
	Grandparental*Paternal	0.090	0.098	0.145	0.010	0.122	0.026
Overprotection	Grandparental	0.159	0.002	0.138	0.007	0.152	0.003
	Maternal	0.086	0.126	0.117	0.044	0.134	0.018
	Paternal	0.063	0.311	0.092	0.150	0.087	0.162
	Grandparental*Maternal	-0.094	0.110	-0.114	0.061	-0.118	0.057
	Grandparental*Paternal	0.052	0.412	0.038	0.560	0.042	0.508
Autonomy	Grandparental	0.066	0.155	0.078	0.105	0.085	0.070
	Maternal	-0.122	0.012	-0.170	0.001	-0.177	0.000
	Paternal	-0.062	0.209	-0.016	0.756	-0.050	0.324
	Grandparental*Maternal	0.073	0.147	0.092	0.079	0.100	0.050
	Grandparental*Paternal	-0.161	0.001	-0.170	0.001	-0.187	0.000

^aThe regression coefficients were adjusted for children's sex, siblings, and grade, and both grandparenting styles and parenting styles were centralized

The bold values indicate significant results