

How Chinese children's filial piety beliefs affect their parents' life satisfaction and loneliness: The serial mediating effect of the intergenerational transmission of social support based on a parent-child pair design

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How Chinese children's filial piety beliefs affect their parents' life satisfaction and loneliness: The serial mediating effect of the intergenerational transmission of social support based on a parent-child pair design

Abstract Guided by the dual filial piety model and socioemotional selectivity theory, this study explores the underlying mechanism of how adult children's filial piety beliefs affect their parent's life satisfaction and loneliness. A total of 350 pairs of parent-child data were collected through a parent-child pair design. Results show that emotional support provided by adult children and emotional support perceived by parents fully mediated the relationship between children's reciprocal filial piety belief and parents' life satisfaction ($\beta = 0.048$, 95% CI: 0.021, 0.081) and loneliness ($\beta = -0.050$, 95% CI: -0.083, -0.024), and partially mediated the relationship between children's authoritarian filial piety belief and parental life satisfaction ($\beta = 0.028$, 95% CI: 0.010, 0.051) and loneliness ($\beta = -0.030$, 95% CI: -0.053, -0.015). This finding suggests that to improve parental well-being, adult Chinese children should not only cultivate their filial piety, but also pay close attention to their parents' emotional needs.

Keywords: filial piety, life satisfaction, loneliness, instrumental support, emotional support, parent-child pair design

1 Introduction

Aging is sweeping the world (Lutz et al., 2008). In particular, China has the largest number of older adults and fastest growth rate of the aging population in the world (Zhong, 2014). By 2050, it is estimated that the population aged 65 and older will number nearly 380 million in China (China Development Research Foundation, 2020). As such, factors affecting the quality of life and successful aging of older adults (Jimenez et al., 2013; Stenhagen et al., 2014) have attracted the attention of scholars (Jiang et al., 2020; Nieboer & Cramm, 2018). Life satisfaction and loneliness are two indicators commonly used to evaluate the quality of life and successful aging of older adults (Tomás et al., 2019). Life satisfaction is a subjective expression of quality of life (Fernandez-Ballesteros et al., 2001). It is positively associated with the mental health, quality of life and well-being of older adults (Gana et al., 2014; Wiest et al., 2012). Loneliness is defined as a state of emotional distress and perceived social isolation (Cacioppo et al., 2006; de Jong, Gierveld & van Tilburg, 2010). It is negatively correlated with the physical and psychological health outcomes of older adults (Beutel et al., 2017; Golden et al., 2009). Therefore, enhancing life satisfaction and reducing loneliness in older adults have important practical significance in an aging society (Cheng, 2015).

For older adults in China, filial piety (or *xiao*) is considered a unique factor affecting life satisfaction (Cai-Xia, 2019; Sun et al., 2019; Wei & Chen, 2014) and loneliness (Kim & Silverstein, 2018; Lin et al., 2009; Simon et al., 2014). In the Chinese context

of family interdependence (Su et al., 2002), filial piety plays an important role in Chinese social and psychological adaptation, including in terms of life satisfaction (Chen, 2014; Yeh et al., 2013), happiness (Chen et al., 2016), and family cohesion (Yeh & Bedford, 2004). Extensive research has shown that individuals' filial piety beliefs are strongly associated with their life satisfaction (Sun et al., 2019; Wu & Chen, 2020) and loneliness (Chen et al., 2016; Zhen et al., 2011). However, these studies have mainly focused on how respondents' filial piety beliefs affect their own life satisfaction and loneliness; less attention has been paid to how children's filial piety beliefs contribute to their parents' successful aging (Lu et al., 2006). As the basic unit of family support in China, adult children are the main venue by which parents acquire resources (Lu et al., 2017). Adult children often provide their parents with many kinds of social support, affecting their experience of aging. Therefore, this study explores how adult children's filial piety beliefs affect the level to which they provide social support to their parents, and how this social support is perceived by and affects the life satisfaction and loneliness of their parents. That is, this research explores the underlying mechanism of how children's filial piety beliefs influence their parents' life satisfaction and loneliness.

1.1 Dual filial piety, life satisfaction, and loneliness

Filial piety, born from traditional Chinese Confucian culture, represents an important virtue and responsibility in the parent-child relationship (Ho, 1996) and plays a crucial role in adult Chinese children's daily lives (Chow, 2001; Guo et al., 2017). It prescribes

how children should treat their parents (Wong et al., 2010). According to the connotations of filial piety, adult children are expected to take care of their parents physically and emotionally to repay the labor and love given when raising them (Yeh, 2003). Therefore, the more children agree with the values espoused by filial piety, the more they will do to meet the needs and expectations of their parents and ensure them a happy and high-quality life (Yeh & Bedford, 2003).

Filial piety shapes the structure and form of Chinese families (Queen et al., 2014) and has maintained harmonious intergenerational relationships for thousands of years (Yeh et al., 2013). However, changing social conditions have redefined children's obligations to their parents (Teo et al., 2003). Filial piety is no longer a purely Chinese notion based on traditional Confucianism, but rather a psychological concept that focuses on parent-child relations (Bedford & Yeh, 2021). Yeh and Bedford (2003) proposed the dual filial piety model (DFPM), comprised of reciprocal and authoritarian filial piety, suggesting that filial piety encompasses two distinct aspects that differ in connotation, nature, and operational function.

Beliefs and behaviors about reciprocal filial piety are motivated by gratitude for parents' sacrifice and characterized as intimate, reciprocal, and natural, representing a genuine appreciation that children have toward the parents who nurtured them (Yeh & Bedford, 2003). Previous studies have found that children's reciprocal filial piety belief helps to reduce conflicts with parents (Li et al., 2014; Yeh & Bedford, 2004) and maintain a harmonious parent-child relationship, suggesting that children's reciprocal filial piety

belief is positively linked with parents' perceived quality of life (Chen et al., 2016; Sun et al., 2016). Authoritarian filial piety takes the hierarchical ranking of authority and cultural norms as prototypes, accentuating children's respect for and obedience to their parents (Yeh & Bedford, 2003; Yeh & Bedford, 2004). Studies have found that children's authoritarian filial piety belief is closely associated with their respect for and obedience to their parents, extensions of their effort to meet their parents' filial expectations (Bedford & Yeh, 2021). This indicates that children's authoritarian filial piety belief may enhance their parents' life satisfaction and reduce their loneliness. A study using a parent-child pair design found that children's filial piety beliefs can significantly predict their parents' subjective well-being (Lu et al., 2006). Therefore, based on the DFPM, this study proposed Hypothesis 1: Two sorts of filial piety in adult children can positively predict parents' life satisfaction and negatively predict parents' loneliness.

1.2 The role of social support in life satisfaction and loneliness

Previous studies have found that social support is significantly associated with life satisfaction and loneliness in older adults (Bai et al., 2018; Cao & Lu, 2021; Chen & Feeley, 2013; Halstead et al., 2018; Wan et al., 2013; Wang, 2016). Social support refers to the supportive resources that individuals obtain through a network of mutual assistance (Thoits, 2011). According to the socioemotional selectivity theory, social support networks decline normatively in later life (English & Carstensen, 2014). Due to their feelings regarding running out of time, older adults are inclined to selectively

seek social support from intimate social partners and invest great resources in emotionally meaningful activities to maximize their well-being. Compared with other social members, adult children are the people closest to their parents, and important sources of instrumental support, caregiving, and affective bonding (Andrews, 2018; Sheung-Tak et al., 2006). Therefore, adult children have extensive influence over their parents' daily lives, loneliness, and quality of life (Hsu, 2020; Huxhold et al., 2013; Marini et al., 2020; Ortman et al., 2014; Queen et al., 2014).

Social support is a comprehensive concept that can be divided into instrumental and emotional support (Morelli et al., 2015). Instrumental support refers to tangible support, such as providing living expenses and doing housework for parents; emotional support emphasizes satisfying parents' emotional needs, including providing comfort, listening to, and communicating with parents (Ho et al., 2012; Ikels & Charlotte, 2004). Different types of social support have different relationships with well-being (Merz & Consedine, 2009; Morelli et al., 2015). Previous studies have found that receiving instrumental support is related to a loss of autonomy and increasing need and dependence; as a result, it tends to have a negative impact on well-being (Reinhardt et al., 2006). Emotional support is positively associated with well-being (Merz & Huxhold, 2010). In addition, researchers have shown that emotional support is more effective at reducing loneliness and increasing well-being than is instrumental support (Hombrados-Mendieta et al., 2013; Morelli et al., 2015). Therefore, it is still unclear whether instrumental and emotional support provided by adult children can equally affect parents' life satisfaction and loneliness.

1.3 Filial piety and social support

Can adult children's beliefs regarding reciprocal and authoritarian filial piety predict their instrumental and emotional support of their parents? The answer is yes, but the results of various studies are inconsistent. Yeh et al. (2009) proposed that reciprocal filial piety emphasizes offspring's repayment of their parents' investment. Chinese adults with a greater sense of reciprocal filial piety tend to provide more instrumental and emotional support to their parents. Accordingly, these researchers found that reciprocal filial piety belief could positively predict the frequency at which children gave money to, did housework for, and satisfied the emotional concerns of their parents. However, authoritarian filial piety entails children complying with their parents' wishes and obeying their parents' absolute authority (Yeh, 2003). Therefore, the authors found that authoritarian filial piety belief could only predict those behaviors with mandatory attributes, such as giving alimony and caring for sick parents (Yeh & Yang, 2009).

However, other researchers have suggested that the motivation for reciprocal filial piety arises from the deep emotional connection between parents and children, whereas the motivation for authoritarian filial piety comes from the social and moral endowment that children have a responsibility and obligation to take care of their parents (Hu, 2018; Wei & Zhong, 2015). Therefore, these authors found that children's reciprocal filial piety belief could predict their emotional support of their parents and authoritarian filial piety belief could predict their financial or material support.

Although the above studies show inconsistent results regarding how children's filial piety beliefs affect their social support of their parents, the core of filial piety requires children to prioritize their parents' needs and bear an obligation to care for them (Tsai, 1999). Therefore, we assumed that children's two sorts of filial piety beliefs could predict their instrumental and emotional support of their parents (Chen et al., 2014; Kooshar et al., 2012; Tian, 2016).

1.4 The influence of filial piety on life satisfaction and loneliness via social support

According to the DFPM, children's filial piety beliefs can affect their filial behaviors, which are usually manifested in the provision of social support to their parents (Ho et al., 2012; Ikels & Charlotte, 2004). Children providing social support to their parents enhances the parents' quality of life and sense of well-being. Therefore, previous studies have found that parents' perceived social support plays a mediating role in the influence of their perceived filial piety of children on their life satisfaction and loneliness (Cheng & Chan, 2006; Chong & Liu, 2016; Merz et al., 2010; Ruiz, 2007; Yeh, 2009).

How can children's social support affect their parent's life satisfaction and loneliness? First, can children's social support directly predict their parents' life satisfaction and loneliness? As mentioned above, this remains unclear. However, according to the main effect model, increasing social support could directly affect one's mental health (Cohen, 1988; Fried & Tiegs, 1993). Therefore, children's social support may have a direct

effect on their parents' life satisfaction and loneliness. Second, the DFPM indicates that filial piety is a psychological concept, emphasizing the operating mechanism of psychological functions between parents and children (Bedford & Yeh, 2021). It is possible that whether children's social support can predict their parents' well-being depends on whether their parents perceive the support. In other words, children's social support may affect their parents' life satisfaction and loneliness via the support the parents perceive.

Therefore, we propose the serial mediating roles of support provided by children and support perceived by parents in the relationship between children's filial piety beliefs and parents' life satisfaction and loneliness. Through a parent-child pair design, we investigated adult children's filial piety beliefs and the life satisfaction and loneliness of their father or mother. Importantly, adult children rated their frequencies regarding items related to social support provided to their parents, whereas the parent evaluated their perceived frequency of these items. We propose the following additional hypotheses:

Hypothesis 2: The instrumental support provided by children and instrumental support perceived by parents play serial mediating roles in the relationship between children's filial piety beliefs and parents' life satisfaction and loneliness.

Hypothesis 3: The emotional support provided by children and emotional support perceived by parents play serial mediating roles in the relationship between children's filial piety beliefs and parents' life satisfaction and loneliness.

2 Method

2.1 Participants

This study was approved by the Ethics Committee of the School of Psychology at XXX University. We employed college students to collect data during their summer vacation. Participants were recruited from seven cities in China, including Fuzhou, Putian, Taiyuan, Tongren, Xiamen, Yangquan, and Zhumadian. The college students first collected participant data by means of a convenience sampling, and then asked participants to take a paired questionnaire home to their father or mother (or one of their children) to complete together. Participants were asked to take the adult child or parent who had already completed the questionnaire as the matched participant to complete their questionnaire. After they completed the questionnaire, they returned it to the students. Older adults who were unable to complete the questionnaire by themselves completed it under the guidance of the college students or their children. A total of 430 paired questionnaires were collected. This study used the following criteria to screen effective paired questionnaires: (1) no contradictory answers (e.g., choosing ‘widowed’ on marital status but ‘living with spouse and children’ on living arrangement, or choosing ‘living only with parents’ by the child but ‘living only with spouse’ by the parent); (2) missing less than 20% of the total questions; (3) no obvious sign of answers being provided by others (e.g., child and parent give the same answers on the same scale); and (4) no obvious regular answers (e.g., choosing the same option for 10 or

more successive questions). Of the total, 80 paired questionnaires were excluded, thereby making the effective rate as high as 81.4%.

The adult children sample had a mean age of 39.00 years ($SD = 7.56$; age range = 20-58 years); 52.9% were male, 82.3% were married, and 17.7% were widowed, divorced or unmarried. Approximately 44.0% had an education level of junior high school, and 56.0% had an education level of senior high school or above; 67.4% had a monthly income of 5,000 yuan or less, and 32.0% earned more than 5,000 yuan per month.

The parent sample had a mean age of 67.62 years ($SD = 7.47$; age range = 44-91 years); 44.6% were male, 78.9% were married, and 19.7% were widowed or divorced. Approximately 28.3% had an education level of primary school or below, 32.9% had an education level of junior high school, and 38.9% had an education level of senior high school or above; 46.0% had a monthly income of 5,000 yuan or less, and 54.0% earned more than 5,000 yuan per month.

[Table 1 near here]

2.2 Measures

2.2.1 Filial Piety

The filial piety of the adult children was measured by a 16-item Dual Filial Piety Scale (DFPS; Yeh & Bedford, 2003). The DFPS is a 6-point Likert-type scale (1 = extremely unimportant, 6 = extremely important). It includes eight items for each domain: reciprocal filial piety (e.g., “Supporting parents makes their lives more comfortable”)

and authoritarian filial piety (e.g., “No matter what my parent asks, I do it immediately”). The score for each subscale ranged from 8 to 48, with higher scores indicating stronger filial piety beliefs. In this study, the Cronbach’s alpha coefficients for reciprocal and authoritarian filial piety were 0.844 and 0.772, respectively.

2.2.2 Support provided by adult children and support perceived by parents

The intergenerational transmission of social support between children and parents was measured by two self-designed questionnaires: the Support Provided by Adult Children scale and Support Perceived by Parents scale. Confirmatory factor analysis (CFA) and specific questionnaire entries can be found in **Supplementary Material 1**.

The Support Provided by Adult Children scale consisted of 10 items, of which six measured instrumental support and four measured emotional support. Adult children were asked to rate the frequency of the support they provided to their parents. The scale was a 5-point Likert-type scale (0 = none and 4 = always). The higher the score, the more social support that was provided. In this study, the Cronbach’s alpha coefficients for instrumental and emotional support provided were 0.795 and 0.831, respectively.

The Support Perceived by Parents scale also consisted of 10 items, of which six measured instrumental support and four measured emotional support. Each item of this scale corresponded to the Support Provided by Adult Children scale. For example, adult children were asked to rate the frequency at which they ‘do housework’ for their parents, while parents were asked to rate how often the matched child would ‘do housework’ for them. The scale was a 5-point Likert-type scale (0 = none and 4 = always). The

higher the score, the more social support they perceived. In this study, the Cronbach's alpha coefficients for the instrumental and emotional support perceived were 0.776 and 0.872, respectively.

2.2.3 Life satisfaction

Parents' life satisfaction was assessed by the 5-item Satisfaction with Life Scale (SWLS; Diener et al., 1985). Participants were asked to rate their level of agreement with each item, for instance, "In most ways my life is close to my ideal." The SWLS is scored on a 7-point Likert-type scale (1 = strongly disagree and 7 = strongly agree). Higher score indicates higher life satisfaction. In this study, the Cronbach's alpha coefficient for the SWLS was 0.871.

2.2.4 Loneliness

The 3-item UCLA Loneliness Scale was compiled by Hughes et al. (2004) and used here to measure parental loneliness. This scale contained only three items: (1) How often do you feel that you lack companionship? (2) How often do you feel left out? and (3) How often do you feel isolated from others? Participants responded regarding the frequency of the above experiences. The options included: (1) Hardly ever, (2) Some of the time, and (3) Often. Loneliness scores ranged between 3 and 9. The higher the score, the stronger was the feelings of loneliness. In this study, the Cronbach's alpha coefficient for the scale was 0.807.

2.3 Data analysis

SPSS 22.0 was used to preliminarily sort the data and conduct a correlation analysis and reliability test. Structural equation modeling was adopted using M-plus 8.0 to test the hypothesized model. The mediation effect was tested in a two-step procedure (Anderson & Gerbing, 1988). First, the measurement model was tested through CFA to assess the goodness-of-fit represented by the explicit indicators. Then, as a second step, the structural equation model was examined using Amos 22.0 to evaluate whether the research hypotheses could be supported. Diverse indices recommended by other researchers (Markus, 2012) were calculated to evaluate the reliability of fit of the structural equation model, including the chi-squared statistic (χ^2), root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker–Lewis index (TLI, also known as the non-normed fit index). CFI and TLI values greater than 0.90 and an RMSEA value lesser than 0.8 were considered an indications of an acceptable fit (Kline, 1998). Finally, a bootstrap test was used to repeat the sampling 2,000 times to perform an intermediate effect test and estimation of the confidence interval. If the 95% confidence interval did not contain zero, then the indirect effect was considered significant (MacKinnon et al., 2004).

3 Results

3.1 Descriptive statistics and correlation analysis

The descriptive statistics and correlations for the variables are presented in Table 2. Adult children’s reciprocal ($M = 41.729$, $SD = 4.544$) and authoritarian filial piety belief ($M = 29.749$, $SD = 6.640$) were both positively associated with the instrumental ($M =$

2.285, $SD = 0.788$) and emotional support ($M = 2.729$, $SD = 0.657$) provided to their parents, instrumental ($M = 2.464$, $SD = 0.846$) and emotional support ($M = 2.694$, $SD = 0.736$) perceived by their parents, and parents' life satisfaction ($M = 4.765$, $SD = 1.209$). Both forms of filial piety beliefs negatively correlated with loneliness ($M = 4.633$, $SD = 1.527$). In addition, adult children's instrumental and emotional support had significant correlations with their parents' perceived instrumental and emotional support. However, adult children's emotional support, but not their instrumental support, was correlated with parents' life satisfaction and loneliness. Parents' perceived instrumental and emotional support were significantly associated with their life satisfaction and loneliness.

[Table 2 near here]

3.2 Measurement model

CFA was used to validate the measurement model, which included four latent variables: instrumental support provided by adult children, emotional support provided by adult children, instrumental support perceived by parents, and emotional support perceived by parents. The test of the measurement model indicated a good fit to the data, $\chi^2/df = 2.575$, CFI = 0.916, TLI = 0.901, RMSEA = 0.067, SRMR = 0.052. The factor loading index of each latent variable was significant ($p < 0.001$), indicating that all potential factors for the respective indexes were well-represented.

3.3 Structural model

3.3.1 Total effects of the two sorts of filial piety on life satisfaction and loneliness

First, the direct path coefficient from the predictor (i.e., reciprocal or authoritarian filial piety) to the criterion (i.e., life satisfaction or loneliness) without mediators was tested. This model fit the data well, $\chi^2/df = 1.538$, CFI = 0.978, TLI = 0.994, RMSEA = 0.039, SRMR = 0.033. The results indicate that the total effects of reciprocal and authoritarian filial piety on life satisfaction ($\beta = 0.144$, $p = 0.007$ for reciprocal filial piety and $\beta = 0.190$, $p < 0.001$ for authoritarian filial piety) and loneliness ($\beta = -0.137$, $p = 0.01$ for reciprocal filial piety and $\beta = -0.203$, $p < 0.001$ for authoritarian filial piety) were significant.

3.3.2 Serial mediating effects of support provided by adult children and support perceived by parents

Multiple serial mediation models were built to test the serial mediating effects of support provided by adult children and support perceived by parents in the relationship between filial piety and life satisfaction/loneliness (see Figure 1). The control variables included gender, age, marital status, education level, and parents' monthly income. The model fit well, $\chi^2/df = 1.346$, CFI = 0.955, TLI = 0.981, RMSEA = 0.031, SRMR = 0.027. This showed that the direct effect of authoritarian filial piety was significant on both life satisfaction ($\beta = 0.13$, $p = 0.02$) and loneliness ($\beta = -0.14$, $p = 0.01$), but the direct effect of reciprocal filial piety was insignificant on life satisfaction ($\beta = 0.02$, $p = 0.674$) and loneliness ($\beta = -0.01$, $p = 0.855$). However, adult children's filial piety affected parents' life satisfaction and loneliness only via the serial mediating effects of

emotional support provided by adult children and emotional support perceived by parents.

[Figure 1 about here]

Next, a bootstrapping procedure was adopted to examine the mediating effects (see Table 3). The results indicate that the effects of emotional support provided by adult children and emotional support perceived by parents both fully mediated the relationship between adult children's reciprocal filial piety and parents' life satisfaction ($\beta = 0.048$, 95% CI: 0.021, 0.081) and the relationship between adult children's reciprocal filial piety and parents' loneliness ($\beta = -0.050$, 95% CI: -0.083, -0.024). In addition, emotional support provided by adult children and emotional support perceived by parents partially mediated the relationship between adult children's authoritarian filial piety and parents' life satisfaction ($\beta = 0.028$, 95% CI: 0.010, 0.051) and the relationship between adult children's authoritarian filial piety and parents' loneliness ($\beta = -0.030$, 95% CI: -0.053, -0.015).

[Table 3 about here]

4 Discussion

Through a parent-child pair design, this study explored the underlying mechanism of how children's filial piety beliefs influenced their parents' life satisfaction and loneliness. The results show that: (1) without controlling for any variables, children's reciprocal and authoritarian filial piety beliefs predicted both their parents' life

satisfaction and loneliness. However, only authoritarian filial piety significantly predicted their parents' life satisfaction and loneliness in the mediation model. (2) Both the emotional support provided by children and emotional support perceived by parents (i.e., the intergenerational transmission of emotional support) fully mediated the relationship between children's reciprocal filial piety belief and parents' life satisfaction and loneliness, and partially mediated the relationship between children's authoritarian filial piety belief and parents' life satisfaction and loneliness. (3) The mediating roles of instrumental support provided by children and instrumental support perceived by parents (i.e., the intergenerational transmission of instrumental support) did not influence the effect of the children's filial piety beliefs on their parents' life satisfaction and loneliness.

In the mediation model, the children's authoritarian (but not their reciprocal) filial piety belief directly predicted their parents' life satisfaction and loneliness, partially supporting H1. This finding provides further empirical evidence for the DFPM in that different sorts of filial piety had different operational functions. Previous study has found that as society has changed, so has the concept of filial piety (Li, 2020). Different generations have different ways of understandings a child's duty to their parents. Authoritarian (but not reciprocal) filial piety has been found to be closer to the filial piety expected by older people (Cheng & Chan, 2006; Liu & Hui, 2009). Authoritarian filial piety is consistent with the idea in traditional Chinese culture that children must obey their parents (especially father) absolutely. Moreover, Chinese parents tend to favor authoritative and authoritarian parenting (Supple et al., 2009; Zhang et al., 2017),

indicating that most wish their children to abide by their opinions and obey their authority. Therefore, children's authoritarian filial piety, and not their reciprocal filial piety, directly predicted their parents' life satisfaction and loneliness. This also explains why the intergenerational transmission of emotional support fully mediated the relationship between children's reciprocal filial piety and parents' life satisfaction and loneliness, while it only partially mediated the relationship between children's authoritarian filial piety and parents' life satisfaction and loneliness.

This study found that children with higher reciprocal filial piety belief provided more instrumental and emotional support to their parents, while their authoritarian filial piety belief only predicted their emotional and not their instrumental support. In previous studies, researchers investigated three kinds of social support: giving money/financial support, doing housework/providing daily care, and caring for emotional concerns (Ho, 2018; Hao & Yu, 2015; Wei & Zhong, 2015; Yeh, 2009). They consistently found that children's reciprocal filial piety, but not their authoritarian filial piety, predicted their emotional concern for their parents. However, 'giving money/financial support' and 'doing housework/providing daily care' offered conflicting results. Only one study found that children's reciprocal filial piety predicted 'giving money/financial support' and 'doing housework/providing daily care' (Yeh, 2009); the other three showed that children's authoritarian filial piety predicted only 'giving money/financial support.' Different from these studies, the present work used the mean values of four kinds of instrumental support and six kinds of emotional support as indicators. The results obtained by using these more comprehensive indicators were relatively stable. In

addition, the data used in the above four studies were obtained from surveys conducted in 2006. It is possible that the results of those studies may not reflect the relationship between filial piety and social support provided by young people in the present era. Nevertheless, we cannot assert that our results are the most realistic among the entirety of the research on this topic. Further work is needed to explore the influence of children's different sorts of filial piety beliefs on the instrumental and emotional support provided to their parents.

In addition, the present research found that children's instrumental and emotional support were unable to directly predict their parents' life satisfaction and loneliness. No previous research has explored whether social support as rated by adult children could affect life satisfaction and loneliness as evaluated by parents. Previous studies usually investigated parents' perceptions of the social support received from their children, finding that such perceived social support predicted life satisfaction and loneliness (Cheng & Chan, 2006; Chong & Liu, 2016; Merz et al., 2010; Ruiz, 2007). These results support our own, which show that children's social support must be perceived by their parents in order to affect their life satisfaction and loneliness.

Most importantly, this study found that children's filial piety beliefs affected their parents' life satisfaction via the mediating role of intergenerational transmission of emotional support, but not via the mediating role of intergenerational transmission of instrumental support. The intergenerational transmission of emotional support fully mediated the relationship between reciprocal filial piety and parents' life satisfaction

and loneliness, whereas it only partially mediated the relationship between authoritarian filial piety and parents' life satisfaction and loneliness (for an explanation of this full vs. partial mediation effect, see the second paragraph in the Discussion section). These results support H2 but not H3, and are consistent with the prediction of socioemotional selectivity theory, which states that as people get older, seeking emotional satisfaction becomes an increasingly primary goal. Individuals tend not only to focus on relationships that feel intimate and satisfying, but also invest great resources in emotionally meaningful activities (Carstensen, 2006). Children expressing emotional concern for their parents meets parents' emotional needs. This is consistent with previous studies showing that emotional support is more important than instrumental support to the well-being of older adults (Hombrados-Mendieta et al., 2013; Merz & Huxhold, 2010). In addition, study has found that whether instrumental support can affect the subjective well-being of older adults depends on if the support provider integrates emotion into that support (Morelli et al., 2015). Therefore, the intergenerational transmission of emotional rather than instrumental support mediated the influence of children's filial piety beliefs on parents' life satisfaction and loneliness.

5 Limitations

Several limitations on this study should be considered. First, our results do not support causal relationships among filial piety, the intergenerational transmission of social support, and life satisfaction and loneliness, due to the cross-sectional design. Further research could eliminate this limitation by adopting a panel study design over a longer

period to replicate the findings. Second, social support is an interactive process (Chu et al., 2010). Previous studies have shown that parents providing social support to their adult children also improve their own life satisfaction (Chen & Silverstein, 2000; Kim & Kim, 2003). It may be helpful to understand how children's filial piety beliefs affect their parents' life satisfaction and loneliness by investigating the interaction of social support between children and parents. Finally, the samples considered in this research consisted only of mainland Chinese. China has a uniquely Confucian culture, different from most other countries in the world. At the same time, other countries and regions do emphasize the Confucian virtue of filial piety. Future work should attempt to replicate these findings in different samples and cultural settings.

6 Conclusion

This study explores the underlying mechanism of how children's filial piety affects their parents' life satisfaction and loneliness. The primary contribution of this research is its examination of the intergenerational transmission of instrumental and emotional support through a parent-child pair design. This study bridges the DFPM and socioemotional selectivity theory and clarifies the mechanism by which children's filial piety affects parental well-being, in that children demonstrating greater levels of filial piety provide their parents with more emotional support, which is then perceived by their parents and eventually improves their life satisfaction and reduces their loneliness. This study suggests that to improve parental well-being, adult children should not only

cultivate their filial piety beliefs, but also pay close attention to their parents' emotional needs.

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Table 1
Sociodemographic information for participants

Variables		Adult children N (%)	Parents N (%)
Gender	Male	185 (52.9%)	156 (44.6%)
	Female	162 (46.3%)	193 (55.1%)
	Missing	3 (0.9%)	1 (0.3%)
Age (<i>M ±SD</i>)		39.00 ± 7.56	67.62 ± 7.47
Marital status	Married	288 (82.3%)	276 (78.9%)
	Others	62 (17.7%)	69 (19.7%)
	Missing	0	5 (1.4%)
Education level	< 6 years	0	99 (28.3%)
	6-9 years	154 (44.0%)	115 (32.9%)
	> 9 years	196 (56.0%)	136 (38.9%)
	Missing	2 (0.6%)	0
Monthly income	≤5000	236 (67.4%)	161 (46.0%)
	>5000	112 (32.0%)	189 (54.0%)
	Missing	2 (0.6%)	0

Note: 'others' for adult children includes widowed, divorced, or unmarried, but for parents, it includes widowed or divorced.

Table 2
Means, standard deviations, and correlations of variables ($N = 350$).

	RFP	AFP	ISPAC	ESPAC	ISPP	ESPP	Life satisfaction	Loneliness
RFP	1							
AFP	.332***	1						
ISPAC	.338***	.189***	1					
ESPAC	.478***	.395***	.468***	1				
ISPP	.288***	.135*	.565***	.255***	1			
ESPP	.324***	.256***	.222***	.505***	.462***	1		
Life satisfaction	.144**	.190***	0.09	.122*	.178***	.251***	1	
Loneliness	-.137**	-.203***	-0.088	-.214***	-.168**	-.266***	-.347***	1
Range	8-48	8-48	0-4	0-4	0-4	0-4	1-7	3-9
<i>M</i>	41.729	29.749	2.285	2.729	2.464	2.694	4.765	4.633
<i>SD</i>	4.544	6.640	.788	.657	.846	.736	1.209	1.527

Note: RFP = reciprocal filial piety of adult children, AFP = authoritarian filial piety of adult children, ISPAC = instrumental support provided by adult children, ESPAC = emotional support provided by adult children, ISPP = instrumental support perceived by parents, ESPP = emotional support perceived by parents; * $p < .05$; ** $p \leq .01$; *** $p \leq .001$.

Table 3
Indirect effect and 95% confidence intervals for model

Model pathways	estimated	95%CI	
		lower	upper
RFP → ESPAC → ESPP → life satisfaction	0.048	0.021	0.081
RFP → ESPAC → ESPP → loneliness	-0.050	-0.083	-0.024
AFP → ESPAC → ESPP → life satisfaction	0.028	0.010	0.051
AFP → ESPAC → ESPP → loneliness	-0.030	-0.053	-0.015

Note: RFP = reciprocal filial piety of adult children, AFP = authoritarian filial piety of adult children, ESPAC = instrumental support provided by adult children, ESPAC = emotional support provided by adult children, ESPP = instrumental support perceived by parents, ESPP = emotional support perceived by parents.

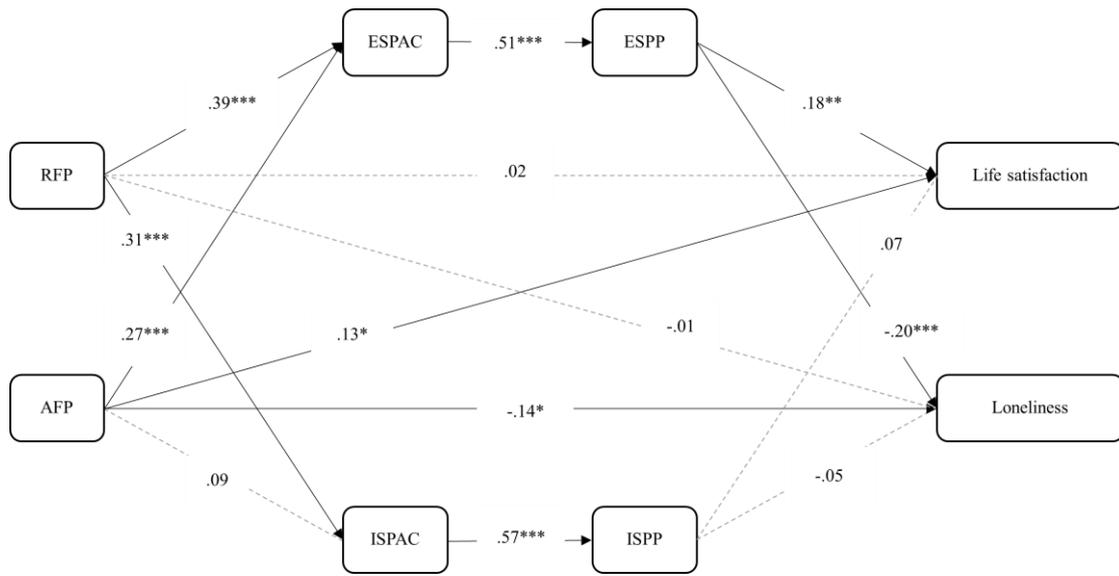


Figure 1

The serial mediating effects of the intergenerational transmission of social support between adult children’s reciprocal filial piety and parents’ life satisfaction/loneliness

Note: RFP = reciprocal filial piety of adult children, AFP = authoritarian filial piety of adult children, ISPAC = instrumental support provided by adult children, ESPAC = emotional support provided by adult children, ISPP = instrumental support perceived by parents, ESPP = emotional support perceived by parents; * $p < .05$; ** $p \leq .01$; *** $p \leq .001$.

Supplementary Material 1

The results of confirmatory factor analysis of Support Provided by Adult Children scale and Support Perceived by Parents scale have shown that both scales have a stable structure. A preliminary analysis of the distribution of data showed that the skewness coefficient of each item was between 0.725 and 0.011, and the absolute value of the kurtosis coefficient was between 0.884 and 0.08. When the skewness coefficient is less than 2 and kurtosis coefficient is less than 7, the maximum likelihood method estimation is robust (Finney & DiStefano, 2013). Therefore, M-plus was used to perform the confirmatory factor analysis on two scales by maximum likelihood. Results showed that the model fit was reasonable, $\chi^2/df = 2.575$, CFI = 0.916, TLI = 0.901, RMSEA = 0.067, SRMR = 0.052. Factor loadings of all items were significant, indicating that the item underlying factor measurement was reasonable (see Table 1 and 2).

Table 1. The factor loadings of Support Provided by Adult Children scale

	Items	Factor 1	Factor 2
Provided instrumental support	1. Provide living expenses	0.651	
	2. Buy daily necessities	0.747	
	3. Do housework	0.701	
	4. Take care of parents when they are in sick	0.738	
Provided emotional support	5. Listen to parents' minds		0.690
	6. Attach importance to parents' opinions		0.694
	7. Assert parents' authority		0.690
	8. Caring and comforting parents		0.686
	9. Comply with parents' requirements		0.557
	10. Provide support and advices when parents encounter problems		0.700

Table 2. The factor loadings of Support Perceived by Parents scale

	Items	Factor 1	Factor 2
Perceived instrumental support	1. Provide living expenses	0.572	
	2. Buy daily necessities	0.670	
	3. Do housework for me	0.733	
	4. Take care of me when I am in sick	0.677	
Perceived emotional support	5. Listen to my' minds		0.813
	6. Attach importance to my opinions		0.796
	7. Assert my authority		0.727
	8. Caring and comforting me		0.727
	9. Comply with my requirements		0.716
	10. Provide support and advices when I encounter problems		0.670

Finney, S. J., & DiStefano, C. (2013). Nonnormal and categorical data in structural equation modeling. In G. R. Hancock & R. O. Mueller (Eds.), *Structural equation modeling: A second course* (pp. 439–492). IAP Information Age Publishing.

Appendix

1. Support Provided by Adult Children Scale

Instruction: Please rate the frequencies that you have provided the following support to your parent:

	None	Seldom	Sometimes	Often	Always
1. Provide living expenses	0	1	2	3	4
2. Buy daily necessities	0	1	2	3	4
3. Do housework	0	1	2	3	4
4. Take care of parents when they are in sick	0	1	2	3	4
5. Listen to parents' minds	0	1	2	3	4
6. Attach importance to parents' opinions	0	1	2	3	4
7. Assert parents' authority	0	1	2	3	4
8. Caring and comforting parents	0	1	2	3	4
9. Comply with parents' requirements	0	1	2	3	4
10. Provide support and advices when parents encounter problems	0	1	2	3	4

2. Support Perceived by Parents Scale

Instruction: Please rate the frequencies that your child has provided the following support to you:

	None	Seldom	Sometimes	Often	Always
1. Give living expenses	0	1	2	3	4
2. Buy daily necessities	0	1	2	3	4
3. Do housework for me	0	1	2	3	4
4. Take care of me when I am in sick	0	1	2	3	4
5. Listen to my minds	0	1	2	3	4
6. Attach importance to my opinions	0	1	2	3	4
7. Assert my authority	0	1	2	3	4
8. Caring and comforting me	0	1	2	3	4
9. Comply with my requirements	0	1	2	3	4
10. Provide support and advices when I encounter problems	0	1	2	3	4