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Perceived Parental Sacrifice, Filial Piety and Hopelessness among Chinese Adolescents:

A Cross-Lagged Panel Study

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Abstract

Introduction: There is a dearth of research on examining the longitudinal effects of cultural family processes on adolescent hopelessness, and the mechanisms through which the effects happen. Hence, the present study examined the relationship among parental (paternal and maternal) sacrifices, filial piety and adolescent hopelessness in the Chinese context. *Methods:* The study was based on a three-wave longitudinal data from a sample of 1,569 Chinese adolescents (Time 1: mean age = $13.15 \pm .92$ years; 50.8% girls). The adolescents were invited to fill out a questionnaire containing measurements of studied variables thrice, at an interval of one year. *Results:* The results of cross-lagged panel analysis indicated that maternal sacrifice was associated with filial piety, which in turn was linked with hopelessness among Chinese adolescents. Moreover, there was bidirectional effects of adolescent hopelessness at earlier time point on paternal and maternal sacrifice at later time point via filial piety. *Conclusions:* The study showed that maternal sacrifice serves as a protective factor that reduces adolescents' sense of hopelessness via the development of filial piety. At the same time, the bidirectional indirect effects of filial piety on the relationship between parental sacrifice and adolescent hopelessness also alert family researchers and youth practitioners on the child effects on parental behavior in Chinese families. Theoretical and practical implications of the findings are discussed.

Keywords: parental sacrifice, adolescent hopelessness, filial piety, Chinese, longitudinal study, cross-lagged panel analysis

Introduction

Adolescence is an important developmental stage between childhood and adulthood where an individual builds up his/her self-identity and competence (Erikson, 1968). But at the same time, physical and psychological changes due to maturation heighten one's emotional upheaval and distress (Yeo, Ang, Chong, & Huan, 2007). Among various wellbeing attributes, hopelessness is an important attribute that is linked to higher chance of adolescent suicidal ideation (Lai Kwok & Shek, 2010; Thompson et al., 2005), substance abuse (Jalilian et al., 2014) and violence perpetration (Duke, Borowsky, Pettingell, & McMorris, 2011). Hopelessness refers to one's negative perceptions toward oneself and one's future (e.g., Beck, Weissman, Lester & Trexler, 1974; McLaughlin, Miller, & Warwick, 1996). Due to the predictive pathological nature of hopelessness, further studies were conducted to identify the protective factors that help to reduce the occurrence of hopelessness (e.g., Landis et al., 2007; Rodríguez-Naranjo & Caño, 2016). Among the protective factors, there is evidence showing that positive family processes (e.g., family functioning, effective parent-child communication) have a negative impact on adolescent hopelessness (e.g., Shek, 1999). For instance, Lai Kwok and Shek (2010) revealed that parent-child communication buffers the effects of hopelessness and suicidal ideation.

Although culture plays an important part in shaping family socialization and adolescent development (Bornstein, 2012), there are relatively fewer studies examining cultural family attributes as protective factors that reduce hopelessness. Among the cultural family processes embedded in the Chinese culture, parental sacrifice and filial piety are distinctive features of Chinese family socialization (Ho, 1996; Leung & Shek, 2011a). However, studies on the relationship among parental sacrifice, filial piety and adolescent hopelessness are scarce in the literature. Particularly, the socio-historical characteristics of Hong Kong as a former British

colony may contribute to the different perceptions of parental sacrifice and filial piety between Hong Kong adolescents and those from other Chinese communities. Hong Kong adolescents reported lower levels of filial piety when compared with those from Mainland China and Taiwan (Yeh et al., 2013). Furthermore, many related studies on family processes and adolescent hopelessness adopted a cross-sectional research design, which failed to examine the bidirectional effects that may happen in the families (e.g., Rodríguez-Naranjo, & Caño, 2016; Suldo & Huebner, 2004). As such, this study attempted to examine the relationship among perceived parental sacrifice, filial piety and hopelessness in a three-wave longitudinal data of Chinese adolescents in Hong Kong.

Parental Sacrifice, Filial Piety and Adolescent Hopelessness

Parental sacrifice is an important family process in the Chinese socialization, of which parents surrender their personal needs and desire for fulfilling the developmental needs of their offspring (Leung & Shek, 2011a). Three processes are involved in parental sacrifice. First, family resources (e.g., money, time and effort) are essential for meeting family demands, including their children's development (Gofen, 2009). Therefore, parents need to prioritize various family demands, when family resources are scarce. Finally, parents allocate family resources for better development of their children at the expense of their own needs and interests (Leung & Shek, 2011a). It is noteworthy to differentiate between parental investment and parental sacrifice. While parental investment refers to parental provision of resources for their children's development, parental sacrifice entails the forfeiture of parental interests and desires to meet the developmental needs of their offspring. The former highlights "what is given out to the children", whereas the latter emphasizes "what is given up by the parents" (Leung, 2018).

Based on a qualitative study from parents and adolescents, five dimensions of parental sacrifice were identified, including striving for financial resources, time spent on children's education, restructuring of daily routine for child development, personal sacrifice and concealment of parental worries (Leung & Shek, 2011a).

In the Chinese culture, filial piety is the guiding virtue in regulating the intergenerational behavior of the descendants to their superiors (Ho, 1996; Hwang, 1999). Embedded in the Confucian thought, children are socialized to obey their superiors, follow their commands, bring honor to the family, and avoid disgracing the family name (Ho, 1996). Yeh and Bedford (2003) identified two dimensions of filial piety: authoritarian and reciprocal. While authoritarian filial piety focuses on the children's obligations to follow their parents' will and build family honour under parental expectations, reciprocal filial piety entails the children's appreciation of parental nurturance and support, and a desire to reciprocate their parents out of gratitude (Yeh & Bedford, 2003). The former is guided by obedience toward a normative authority embedded in a hierarchical family system, whereas the latter is generated from intimacy and mutual relatedness within the family dyad (Yeh et al., 2013).

According to the Confucian ideologies, the parent-child interdependent relationship is a unique feature in the Chinese socialization (Chao & Tseng, 2002). Parents are expected to dedicate their love and attention to their children because of benevolence, and reciprocally children should respect and follow the rules of their parents due to filial piety (Yeh & Yang, 1997). As a result, children are socialized to behave according to their parents' expectations (Bempechat, Graham, & Jimenez, 1999) and repay their parents by demonstrating obedience and achievement (Fuligni & Yoshikawa, 2003). The gratitude theory echoes this view by suggesting that filial obligation is generated as a gratitude to parental sacrifice and resource provision

(Keller, 2006). Adolescents develop a desire to repay their parents' contributions, both at present and in future. As Chinese conception of "self" is "interactional and transactional" (de Vos, 1998, p.333) in nature, filial piety is important for promoting psychosocial development and life satisfaction of adolescents (Leung, Wong, Wong, & McBride-Chang, 2010). Hence, it is plausible that adolescents develop filial piety when they make meanings on parental sacrifice, which further instills hope and motivation of adolescents to strive for excellence to repay their parents.

The social capital theory of a family (Coleman, 1990) further portrays how family processes contribute to adolescent development. Parental sacrifice can be viewed as a family social capital that connects family financial capital (i.e., family resources and assets) to adolescent development. Parental sacrifice denotes commitment and love of parents to their children (Leung & Shek, 2013a, b), and the tangible support and resources generated from parental sacrifice are important for adolescent development (Conger, Conger, & Martin, 2010). Feeling indebted by parental sacrifice, adolescents develop filial piety which fosters motivation to excel and repay their parents in the future (Leung & Shek, 2013a). Previous studies showed that parental sacrifice was associated with achievement motivation, which is a hope-related attribute (Feather 1965), among a sample of Chinese adolescents experiencing economic disadvantage in Hong Kong (Leung & Shek, 2013a). Similarly, in a study of low-income immigrant families in the United States, Fuligni and Yoshikawa (2003) showed that in response to parental sacrifice, adolescents develop a sense of filial obligation that motivated them for achievement. Hence, parental sacrifice and filial piety are regarded as hope-inducing attribute for adolescents to excel. However, we should be aware that excessive parental sacrifice may assert pressure and guilty feelings on adolescents, particularly when they anticipate that they are

incapable to repay their parents (Costigan, Hua, & Su, 2010). Under this view, more filial piety may not reduce adolescent hopelessness. As such, there is a need to examine the relationship among parental sacrifice, filial piety and adolescent hopelessness over time.

Bidirectional Relationship among Parental Sacrifice, Filial Piety and Adolescent Wellbeing

While majority of the studies show that parental behavior has direct impacts on adolescent wellbeing (e.g., Suldo & Huebner, 2004), there are other studies supporting a bidirectional linkage between parental behavior and adolescent development (e.g., Reitz, Deković, Meijer, & Engels, 2006; Shek, 1999; Willoughby & Hamza, 2011). Based on transactional theory of human development (Sameroff, 2009), the relationship between parenting practices and adolescent development is bidirectional in nature, i.e., while parental behavior shapes adolescent development and wellbeing, adolescent behavior also affects parenting strategies. For instance, Reitz and colleagues (2006) indicated that previous adolescent internalizing behavioral outcomes (e.g., depression, anxiety, and somatic problems) had negative impacts on parental responsiveness and parent-child qualities subsequently (Reitz et al., 2006). Based on a longitudinal study on a sample of Chinese adolescents in Hong Kong, Shek (1999) identified a bidirectional relationship between positive parenting characteristics (e.g., demandingness, responsiveness) and adolescent hopelessness. According to gratitude theory, gratitude should be considered from the point of view of the benefactor (Keller, 2006). When an adolescent is upset or in despair, it is difficult for him/her to generate filial piety and acknowledge his/her parents' benevolence (Keller, 2006). Together with the viewpoint of the parent-child interdependent principle rooted in the Chinese culture (Yeh & Yang, 1997), adolescents' sense of filial obligation is linked to parental responses. As studies on examining the bidirectional relationships

among parental sacrifice, filial piety and adolescent hopelessness are lacking, there is a need to examine the bidirectional relationships among the variables from longitudinal data of a Chinese sample.

The Current Study

This study examined the relationship among perceived parental (paternal and maternal) sacrifice, filial piety and adolescent hopelessness of Chinese adolescents in Hong Kong over time. Three tested models: (1) an indirect effect model of filial piety on the impacts of parental sacrifice on adolescent hopelessness over time (Figure 1b); (2) a bidirectional model of indirect effects of filial piety on the relationships between parental sacrifice and adolescent hopelessness over time (Figure 1c), and (3) a bidirectional partial mediational model of filial piety on the relationships between parental sacrifice and adolescent hopelessness over time (by adding four direct paths between paternal/maternal sacrifice and adolescent hopelessness; Figure 1d), were tested (Cole & Maxwell, 2003). It was hypothesized that bidirectional model of indirect effects of filial piety (i.e., Figure 1c) would be the best-fit model in accounting of the relationship among parental sacrifice, filial piety and hopelessness of Chinese adolescents.

Method

Participants

A stratified cluster sampling method (Blair, Czaja, & Blair, 2014) of secondary schools was adopted in recruiting the respondents, with school banding and geographical locations as stratifying factors. Finally, 12 secondary schools across Hong Kong participated in the study. At Time 1 (T1), there were 2,133 students studying Secondary 1 and 2 (Grades 7 and 8) participated

in the study. The respondents were invited to fill out the questionnaire at Time 2 (T2) and Time 3 (T3), with an interval of one year. After matching, there were 1,569 respondents who had completed the questionnaires at three time points, with the attrition rate of 22.2%. Logistic regression analyses were performed to examine the effects of demographic characteristics (i.e., adolescent gender, family intactness and family economic disadvantage) and the studied variables (i.e., perceived paternal and maternal sacrifices, filial piety and hopelessness) on sample attrition (dropout = 0, retention = 1). Sample retention was significantly related to adolescent gender (odds ratio [OR] = 1.21, $p < .01$) and family intactness (odds ratio [OR] = 1.12, $p < .05$), with more girls and adolescents in intact families retained in the study. However, there was non-significant relationships between all studied variables at T1 and sample retention, supporting that there was a random dropout of the sample (Fitzmaurice, Heath, & Clifford, 1996). In this study, a sample of 1,569 respondents who had completed the questionnaires at three time points was used in the analyses.

Among the 1,569 respondents at T1, 768 (48.9%) were boys and 795 (50.7%) were girls (6 did not respond). The mean age was 13.15 ($SD = .92$). 868 (55.3%) respondents were Form 1 (Grade 7) students while 698 (44.5%) were Form 2 (Grade 8) students (3 did not respond). 1,205 (76.8%) students came from intact families, while 106 (6.8%), 130 (8.3%), 31 (2.0%) and 41 (2.6%) came from remarried, divorced, separated and widowed families respectively. They were grouped into non-intact families ($n = 308$, 19.7%) (28 respondents reported the “others” option and 28 did not respond their family structure). There were 469 (29.9%) students receiving financial assistance from the Hong Kong Government, including recipients of Comprehensive Social Security Assistance, Full Textbook Allowance, or Low-income Working Family

Allowance. They were considered as the economically disadvantaged adolescents ($n = 37$, 2.4% did not respond their family economic status).

Procedure

During Time 1, invitation letters were given to the parents introducing the purpose and procedures of the study. Written informed consent was obtained from both parents and students. Data collection was conducted in class lessons arranged by the schools. During data collection, researchers or trained research assistants introduced the purpose and procedures of the study, and rights of voluntary participation and withdrawal to the students. The respondents were invited to fill out a questionnaire that contained the measures of paternal and maternal sacrifices, filial piety, hopelessness and some demographic characteristics in a self-administered format. Those who did not participate in the study were allowed to do their homework assignments in class. The students were given adequate time to complete the questionnaires. Identical procedures were performed in Time 2 and Time 3, with an interval of one year. To safeguard the ethical requirements for research on human subjects, the study was approved and monitored by the Human Subjects Ethics Sub-committee of an internationally recognized university.

Measurements

Parental sacrifice

Chinese Paternal/Maternal Sacrifice Scale (PSA/MSA). Based on the literature of social capital (Coleman, 1990) and family investment (Conger et al., 2010), as well as the qualitative findings of Chinese parents and adolescents, the 20-item measurements of PSA and MSA were developed to assess paternal and maternal sacrifice respectively (Leung & Shek, 2011a). The

measurements showed good internal consistency, convergent validity and factorial validity in previous studies (Leung & Shek, 2011b; Leung, Shek, & Ma, 2016). Each item is rated on a 6-point Likert scale ranging from 1 = “strongly disagree” to 6 = “strongly agree”. A sample item is “Even if my father/mother feels tired, he/she tries his/her best to understand my school life”. Higher mean scores of the PSA and MSA indicate higher levels of perceived paternal and maternal sacrifice respectively. Both PSA and MSA showed excellent reliability in the study (PSA: α at Time 1 = .95; α at Time 2 = .95; α at Time 3 = .95; MSA: α at Time 1 = .95; α at Time 2 = .95; α at Time 3 = .95).

Filial piety

Filial Piety Scale (FPS). Based on the related literature of filial piety (Yeh & Bedford, 2003), a 12-item Filial Piety Scale (FPS) was used to measure filial piety. There are two dimensions: authoritarian filial piety (6 items) and reciprocal filial piety (6 items) respectively. A sample item of authoritarian filial piety reads “Listen to parents’ advice on decision about future career” and that of reciprocal filial piety reads “Be grateful to your parents for raising you”. Each item is rated on a 6-point Likert scale ranging from 1 = “strongly disagree” to 6 = “strongly agree”, with higher mean scores of FPS indicating higher levels of filial piety. The FPS showed good reliability in the study (α at Time 1 = .89; α at Time 2 = .88; α at Time 3 = .88).

Hopelessness

Chinese Hopelessness Scale (CHOPEL). Based on The Hopelessness Scale developed by Beck et al., (1974), Shek (1993) translated the measurement into Chinese. The measurements showed good psychometric properties in Chinese samples (Shek 1993, 2003). A five-item

CHOPEL was used in the study (Shek & Li, 2016). A sample item reads “The future seems vague and uncertain to me”. Each item is rated in a 6-point scale from 1 = “strongly disagree” to 6 = “strongly agree”. High mean scores of *CHOPEL* indicate higher levels of one’s sense of hopelessness. The *CHOPEL* showed good internal consistency in this study (α at Time 1 = .88; α at Time 2 = .90; α at Time 3 = .90).

Data Analysis

Cross-lagged panel analysis using the software program of AMOS 23.0 was performed to examine the relationship among perceived parental (paternal and maternal) sacrifice, filial piety and hopelessness of Chinese adolescents in Hong Kong over time. Four models were tested:

M1 – A base model with only within-domain longitudinal paths (i.e., the absence of any cross-domain paths connecting different time points; Figure 1a);

M2 – An indirect effect model of parental sacrifice on adolescent hopelessness via filial piety (Figure 1b);

M3 – A bidirectional model of indirect effects of filial piety on the relationships between parental sacrifice and adolescent hopelessness (Figure 1c);

M4 – A bidirectional partial mediational model of relationships between parental sacrifice and adolescent hopelessness via filial piety, with both significant direct and indirect effects (Figure 1d).

The goodness-of-fit model indicators suggested by Hu and Bentler (1999) were used to assess the model fit of the data, i.e., NFI and CFI > 0.90, RMSEA < 0.06 for a good fit, and between 0.06 and 0.08 for an acceptable fit. Chi-square difference tests were performed to compare different tested models with the base model (M1). *Akaike’s Information Criterion* (AIC)

was adopted to select the model having the best fit of the data, with smaller value of AIC indicates the better model fit (Burnham & Anderson, 2002). When a final model was determined, bootstrapping mediation test (Preacher & Hayes, 2008) with 5,000 bootstrapped re-samples using AMOS 23.0 was performed to assess the significance of the indirect effects. When a “zero” value did not fall into the upper and lower bounds of bias corrected 95% confidence intervals in the bootstrapping mediation test, the indirect effect was supported (Preacher & Hayes, 2008). The effect size of the standardized indirect effect was derived from the ratio of indirect effect to total effect (MacKinnon, 2008). In case the direct and indirect effects have opposite signs, the absolute values of the effects were taken before computing the ratio (Alwin & Hauser, 1975).

Furthermore, multiple group analyses were performed to examine whether the demographic characteristics moderated the regression paths among parental sacrifice, filial piety and adolescent hopelessness. In this study, adolescent gender, family intactness and family economic status were examined as moderators. The unconstrained model was assessed by adopting the goodness-of-fit indicators of NFI and CFI $> .90$, RMSEA $< .06$ for a good fit, and between .06 and .08 for an acceptable fit (Hu & Bentler, 1999). An equality constraint would be imposed to the regression coefficient of each structural path between the groups under comparison. In case the chi-square value of an imposed constraint made a significant difference with chi-square value of the unconstrained model, a moderating effect was identified.

Results

Descriptive statistics of all studied variables were shown in Table 1. The missingness of the data was analyzed using the Missing Value Analysis module in SPSS 25.0 Package. The amount (ranged from 0.1% and 5.7%) and pattern analyses of missing values of items and

measurements supported that the data were Missing Completely at Random Data (MCAR) (Enders & Ebrary, 2010). Besides, the assumptions of normality of the studied variables were met, i.e., the absolute values of skewness and kurtosis were less than 2 and 7 respectively (Curran, West & Finch, 1996). Hence, full information maximum likelihood (FIML) estimation was used to handle the issue of missing data (Arbuckle, 2007). Correlational analyses showed that paternal sacrifice and maternal sacrifice were positively related to filial piety concurrently and longitudinally. Paternal sacrifice at T1 and T2 was negatively associated with hopelessness at T3, whereas maternal sacrifice at T2 was negatively related to hopelessness at T2 and T3. Filial piety was negatively associated with hopelessness concurrently and longitudinally (Table 2).

The base model (M1) showed an acceptable fit of the data, with CFI and NFI values of .929 and .922 respectively ($> .90$; Hu & Bentler, 1999), and RMSEA value of .075 ($< .08$; Hu & Bentler, 1999; Table 2). All other models (M2 to M4) also showed an acceptable fit of the data (Table 3). Among them, M3 (i.e., a bidirectional model between parental sacrifice and adolescent hopelessness via filial piety) showed the smallest AIC value ($AIC = 711.624$), which was selected as the model of the best data fit (Burnham & Anderson, 2002). The results showed that maternal sacrifice at Time 1 was positively associated with adolescent filial piety at Time 2 ($\beta = .07; p < .01$), which in turn was related to lower levels of adolescent hopelessness at Time 3 ($\beta = -.09; p < .001$). Besides, reciprocal indirect effects were also indicated. Adolescent hopelessness at Time 1 was negatively associated with filial piety at Time 2 ($\beta = -.06; p < .01$), and filial piety was linked to more paternal sacrifice ($\beta = .06; p < .01$) and maternal sacrifice ($\beta = .06; p < .01$) at Time 3 respectively. The bootstrapping mediation tests (Preacher & Hayes, 2008) also supported the tested models, with significant indirect effects of three paths: (1)

maternal sacrifice at Time 1 was negatively related to adolescent hopelessness at Time 3 via filial piety at Time 2 (standardized effect = $-.006$; $p < .05$; 95% CI = $[-.013; -.001]$), with effect size (ratio of indirect effect to total effect) = $.46$; (2) adolescent hopelessness at Time 1 was negatively associated with paternal sacrifice at Time 3 via filial piety at Time 2 (standardized effect = $-.004$; $p < .01$; 95% CI = $[-.007; -.001]$), with effect size = $.43$, and (3) adolescent hopelessness at Time 1 was negatively associated with maternal sacrifice at Time 3 via filial piety at Time 2 (standardized effect = $-.004$; $p = .01$; 95% CI = $[-.007; -.001]$), with effect size = $.33$.

Regarding the moderating effects of adolescent gender on the bidirectional indirect model (M3), multiple group analyses showed that there was difference between unconstrained (M5a) and constrained (M5b) models between boys and girls, with $\Delta\chi^2 = 80.042$ ($p < .001$) (Table 4). As far as the indirect effects of filial piety were concerned, equality constraint of each structural path contributing to the indirect effects was imposed between two gender groups. Changes of chi-square values of comparisons between the unconstrained model (M5a) and models of imposed constraints (M5c to M5g) were all non-significant (Table 4), showing that there were gender invariances on the indirect effects of filial piety in the relationship between parental sacrifice and adolescent hopelessness. Similar results were showed when regarding family economic status as a moderator (M6a to M6g; Table 4). For family intactness, there was invariance between adolescent groups growing up in intact families and non-intact (parents with second marriage, divorced, separated, widowed) families, with $\Delta\chi^2 = 40.113$ ($p > .05$) between unconstrained (M7a) and constrained (M7b) models (Table 4). Hence, adolescent gender, family intactness and family economic status were not moderators that altered the indirect relationships between parental sacrifice and adolescent hopelessness via filial piety.

Discussion

The study attempted to examine the relationship among perceived parental (paternal and maternal) sacrifices, filial piety and hopelessness among Chinese adolescents in Hong Kong. The findings indicated that there was bidirectional relationship between maternal sacrifice and adolescent hopelessness via filial piety. The results showed some support on the social capital theory of the family (Coleman, 1988) and the Chinese socialization model (Yeh & Yang, 1997) by illustrating that maternal sacrifice serves as a family social capital to reduce adolescent hopelessness through the development of filial piety. In the Chinese culture, mothers are ready to subordinate their needs and desires for the nurturance of their children (Leung & Shek, 2015). Adolescents who observe their mothers' sacrifice may generate reciprocal filial piety to show their gratitude towards maternal contributions. At the same time, they are filially obliged to reciprocate their mothers under the cultural norms (i.e., authoritarian filial piety; Yeh & Bedford, 2003). Surprisingly, paternal sacrifice did not predict adolescent filial piety. One possibility is that fathers are more distant from their children, which may affect their children's readiness to reciprocate paternal sacrifice. On the contrary, as mothers are highly involved in child socialization (Harris & Marmer, 1996), the physical proximity and affective closeness facilitate adolescents to be more filial to maternal sacrifice. However, the structural path of paternal sacrifice on adolescent filial piety was inconsistent over time, with the regression coefficient was non-significant between T1 and T2, but it was significant between T2 and T3. It is plausible that adolescents may become more mature to recognize paternal sacrifice when they grow older, which may promote their filial piety. As impacts of parent gender role of family processes on filial piety are under-researched, more studies in this area are suggested.

Furthermore, the findings illustrated reverse indirect effects of prior adolescent hopelessness on subsequent paternal and maternal sacrifice via filial piety, supporting the transactional model of human development (Sameroff, 2009). There may be two possibilities to account for the findings. One possibility is that when adolescent exhibit hopelessness, they may reduce their engagement with others, including their parents. This may result in a drop of filial piety (Keller, 2006), which may further lead to negative reactions of their parents toward their children, when the parents perceive that their children are not filial. Another possibility is that high levels of adolescent hopelessness may be linked to family disturbance and disengagement (Pillay & Wassenaar, 1997; Hamilton et al., 2015), which may affect their development of filial piety as well as their perceptions of parental sacrifice. However, the regression coefficient of adolescent hopelessness at T1 on filial piety at T2 was significant, but it was non-significant between T2 and T3. As there is a dearth of longitudinal studies on assessing adolescent wellbeing as an antecedent of filial piety, further studies on this area is suggested.

The study has several theoretical and practical implications. Theoretically, though parental sacrifice and filial piety have been regarded as important Chinese family attributes (Leung & Shek, 2015), the interrelationships among parental sacrifice, filial piety and adolescent wellbeing are seldom explored. This study revealed that filial piety links maternal sacrifice and adolescent hopelessness together, which enhances further development of family models of Chinese socialization. Furthermore, previous studies on parental sacrifice mainly adopted a cross-sectional design (Chao & Kaeochinda, 2010; Leung & Shek, 2015), which failed to examine the bidirectional relationship among parental sacrifice, filial piety and adolescent hopelessness. The findings showed that there is bidirectional relationship among maternal sacrifice, filial piety and adolescent hopelessness over time. The child effect on parental sacrifice

was identified in the study. The findings illustrate the importance of using longitudinal data to examine the bidirectional interactions between parental behavior and adolescent wellbeing.

Third, many family studies did not differentiate between paternal and maternal roles in family processes (e.g., Suldo & Huebner, 2004). This study examined both perceived paternal and maternal sacrifice in their associations with filial piety and adolescent hopelessness. The results give a fuller picture on how parent gender contributes to the relationship among parental sacrifice, filial piety and adolescent wellbeing.

Practically, the study illustrates the importance on increasing adolescents' awareness of maternal sacrifice on the development of filial piety, which in turn helps adolescents reduce their sense of hopelessness. The findings give insights for family practitioners and youth counselors in delivering family education and youth development programs. In addition, youth counselors need to be more sensitive to adolescent wellbeing and how their psychological states affect family interactions in the long run, and provide necessary assistance for them and their families.

There are several limitations in the study. First, the study adopted the perspectives of the adolescents in examining the impacts of parental sacrifice on their wellbeing. The design was understandable as adolescents are regarded as the "receivers" of the family processes (Elstad & Stefansen, 2014), and their subjective experiences on parental sacrifice are crucial in determining their wellbeing (Leung & Shek, 2016b). However, it is methodologically preferable to collect data from multiple sources of informants (i.e., parents and adolescents), which helps to increase the generalizability of the findings. Second, it is difficult to capture the changes of parental sacrifice and filial piety within three time points at a one-year interval (Juang & Cookston, 2009). Besides, the inconsistent findings on the relationships between paternal sacrifice and filial piety, and between adolescent hopelessness and filial piety over time were identified. Hence, it is

preferable to conduct a longitudinal study of multiple years to detect changes. Third, the indirect effects between parental sacrifice and adolescent hopelessness via filial piety were considered small. One possible explanation is that adolescents may not easily realize their parents' sacrifices, as parents often conceal their sacrifice from their children (Leung & Shek, 2011a). Another possibility is that adolescents are usually more critical on their perceptions of parental sacrifice and investment on them (Leung, 2018). Fourth, correlation coefficients between maternal sacrifice at Time 1 and adolescent hopelessness at Time 3, and between adolescent hopelessness at Time 1 and paternal and maternal sacrifice at Time 3 were non-significant, though indirect bidirectional effects of filial piety were identified. Hayes (2009) suggested that there is possibility that if two mediators work in opposite directions on the relationship between independent variables and dependent variables, the two effects may cancel out each other in the estimation of total effects. In this case, parental sacrifice may create stress and guilt on adolescents (particularly those who feel incapable to repay their parents; Costigan, Hua, & Su, 2010), which in turn may increase adolescent hopelessness. Hence, it is necessary to examine other mediating variables (e.g., stress or guilt) that may also contribute to the relationship. Fifth, the study was conducted in Hong Kong. There is a need to replicate the study in other Chinese samples. Lastly, it is insightful to examine the relationships among perceived parental sacrifice, filial piety and hopelessness in a sample of emerging adults, as emerging adults may be more mature to recognize parental sacrifice and develop indebtedness towards their parents.

Despite the limitations, the results indicated that perceived maternal sacrifice exerted an indirect effect on adolescent hopelessness via filial piety. Moreover, bi-directional relationships between parental sacrifice and adolescent hopelessness via filial piety were identified, illustrating the dynamic relationship between adolescent wellbeing and parental responses over time. As

suggested by Bornstein (2012) that future family research needs to pay more attention on culturally specific family practice as well as child effects on parental behavior, this study takes a humble step to the quest.

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Table 1: Descriptive statistics of the variables

	Mean	SD	Skewness	Kurtosis
1. Perceived paternal sacrifice (T1)	3.32	1.05	-.06	-.39
2. Perceived maternal sacrifice (T1)	3.86	1.10	-.22	-.29
3. Filial piety (T1)	4.37	.85	-.57	1.06
4. Hopelessness (T1)	2.86	1.22	.39	-.36
5. Perceived paternal sacrifice (T2)	3.34	.98	-.11	-.20
6. Perceived maternal sacrifice (T2)	3.76	1.01	-.25	-.07
7. Filial piety (T2)	4.36	.76	-.52	1.46
8. Hopelessness (T2)	3.01	1.21	.29	-.44
9. Perceived paternal sacrifice (T3)	3.30	.98	-.11	.01
10. Perceived maternal sacrifice (T3)	3.72	.98	-.20	.01
11. Filial piety (T3)	4.29	.76	-.55	1.66
12. Hopelessness (T3)	3.12	1.15	.17	-.31

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 2: Correlations of the variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Perceived paternal sacrifice (T1)	1.00													
2. Perceived maternal sacrifice (T1)	.62***	1.00												
3. Filial piety (T1)	.44***	.45***	1.00											
4. Hopelessness (T1)	-.03	.01	-.07**	1.00										
5. Perceived paternal sacrifice (T2)	.57***	.34***	.30***	-.06*	1.00									
6. Perceived maternal sacrifice (T2)	.37***	.57***	.33***	-.06*	.61***	1.00								
7. Filial piety (T2)	.29***	.30***	.56***	-.12***	.43***	.48***	1.00							
8. Hopelessness (T2)	-.040	.01	-.08**	.44***	-.040	-.08**	-.12***	1.00						
9. Perceived paternal sacrifice (T3)	.56***	.32***	.30***	-.04	.64***	.39***	.33***	-.05	1.00					
10. Perceived maternal sacrifice (T3)	.37***	.54***	.31***	-.03	.37***	.63***	.35***	-.04	.57***	1.00				
11. Filial piety (T3)	.31***	.33***	.51***	-.07**	.34***	.36***	.61***	-.11***	.45***	.48***	1.00			
12. Hopelessness (T3)	-.08**	-.05	-.13***	.41***	-.08**	-.08**	-.16***	.51***	-.05	-.04	-.11***	1.00		
13. Gender (boys = -1, girls = 1)	.02	.06*	.02	-.00	.03	.03	.01	.05*	.02	.05	.01	.04	1.00	
14. Family economic status (poor = -1, non-poor = 1)	.030	.09***	.02	.07**	.03	.07**	.01	.02	.01	.00	.00	.02	.01	1.00
15. Family Intactness (non-intact = -1, intact = 1)	.11***	.00	.04	-.08**	.09**	.04	.05*	-.09**	.12***	.03	-.01	-.05*	.01	-.16***

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 3: Cross-lagged panel analyses of the relationships among parental sacrifice, filial piety and adolescent hopelessness

Model	Description	χ^2	df	CFI	NFI	RMSEA	AIC	Model comparison	$\Delta\chi^2$	Δdf
M1	Base model	665.033***	67	.929	.922	.075	801.033			
M2	Indirect effect model of parental sacrifice on adolescent hopelessness via filial piety	586.785***	61	.937	.931	.074	734.765	M2 and M1	78.268***	6
M3	Bidirectional model of adolescent hopelessness on parental sacrifice via filial piety	551.624***	55	.941	.935	.076	711.624	M3 and M1	113.409***	12
M4	Bidirectional model of adolescent hopelessness on parental sacrifice via filial piety (Partial mediation)	547.558***	51	.941	.936	.079	715.558	M4 and M1	117.475***	16

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 4: Invariance tests on the relationships between parental sacrifice, filial piety and hopelessness by adolescent gender, family economic status and family intactness

Invariance tests	Model	Equality Constraint	χ^2	df	CFI	NFI	RMSEA	Model comparison	$\Delta\chi^2$	Δdf
Adolescent gender	M5a	Unconstrained model	586.161***	91	.942	.933	.059			
	M5b	Constrained model	666.202***	120	.936	.924	.055	M5b and M5a	80.042***	27
	M5c	Maternal sacrifice at T1 → Filial piety at T2	586.193***	92	.942	.933	.059	M5c and M5a	.032	1
	M5d	Filial piety at T2 → Hopelessness at T3	586.463***	92	.942	.933	.059	M5d and M5a	.302	1
	M5e	Hopelessness at T1 → Filial Piety at T2	588.860***	92	.942	.932	.059	M5e and M5a	2.699	1
	M5f	Filial piety at T2 → Paternal Sacrifice at T3	587.283***	92	.942	.933	.059	M5f and M5a	1.122	1
	M5g	Filial piety at T2 → Maternal Sacrifice at T3	586.229***	92	.942	.933	.059	M5g and M5a	.068	1
Family intactness	M6a	Unconstrained model	597.616***	91	.938	.929	.060			
	M6b	Constrained model	648.164***	120	.935	.923	.054	M7b and M7a	50.548***	27
	M6c	Maternal sacrifice at T1 → Filial piety at T2	598.709***	92	.938	.929	.060	M7c and M7a	1.093	1
	M6d	Filial piety at T2 → Hopelessness at T3	597.879***	92	.938	.929	.060	M7d and M7a	.263	1
	M6e	Hopelessness at T1 → Filial Piety at T2	597.764***	92	.938	.929	.060	M7e and M7a	.148	1
	M6f	Filial piety at T2 → Paternal Sacrifice at T3	598.350***	92	.938	.929	.060	M7f and M7a	.734	1
	M6g	Filial piety at T2 → Maternal Sacrifice at T3	598.755***	92	.938	.929	.060	M7g and M7a	1.138	1
Family economic status	M7a	Unconstrained model	573.895***	91	.942	.933	.058			
	M7b	Constrained model	612.925***	120	.941	.928	.052	M6b and M6a	39.030	27

* $p < .05$, ** $p < .01$, *** $p < .001$

Figure 1a: The base model (M1)

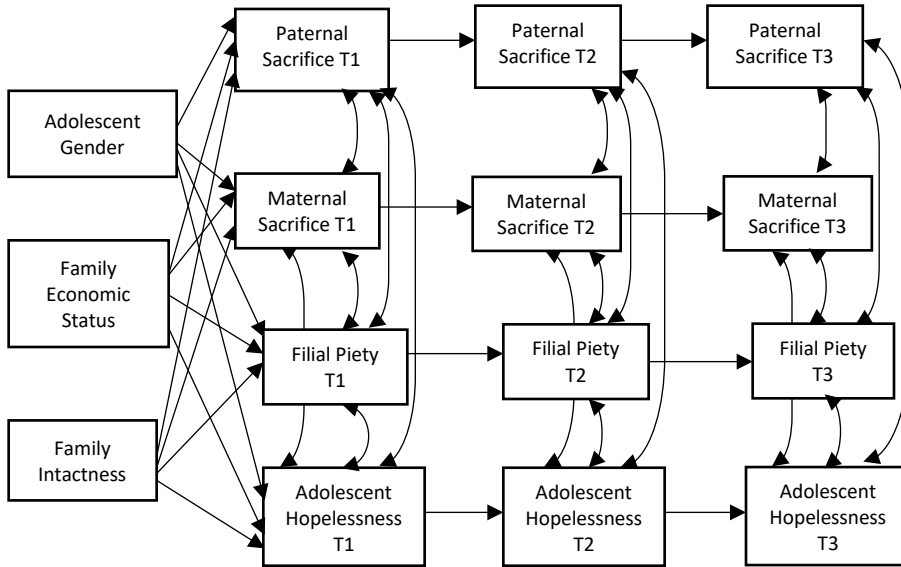


Figure 1b: The indirect effect model of parental sacrifice on adolescent hopelessness via filial piety (Full mediation) (M2)

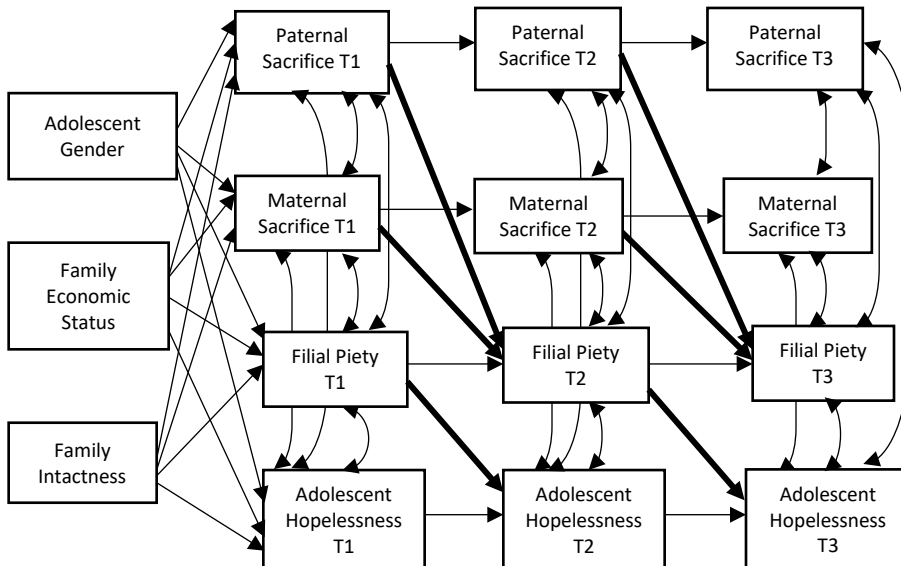


Figure 1c: The bidirectional model between parental sacrifice and adolescent hopelessness via filial piety (M3)

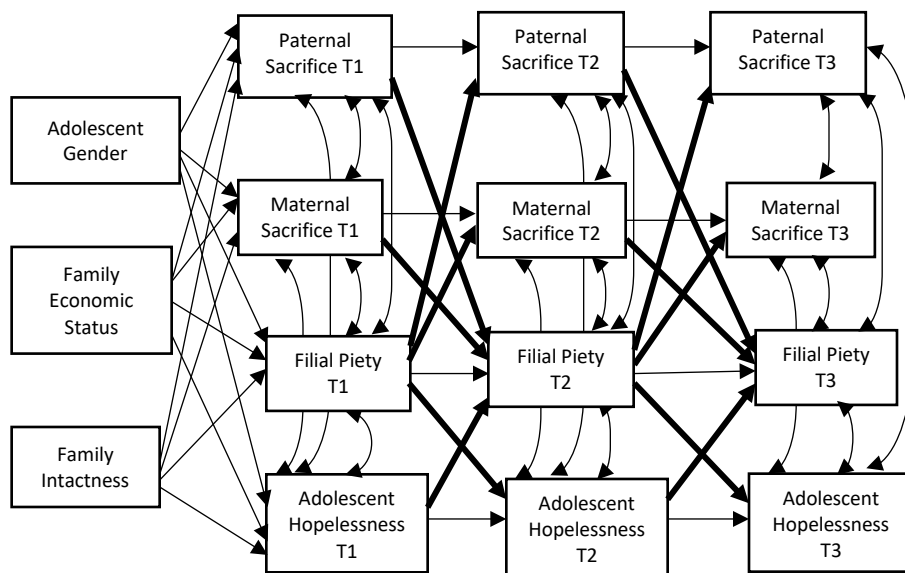


Figure 1d: The bidirectional model between parental sacrifice and adolescent hopelessness via filial piety (Partial mediation) (M4)

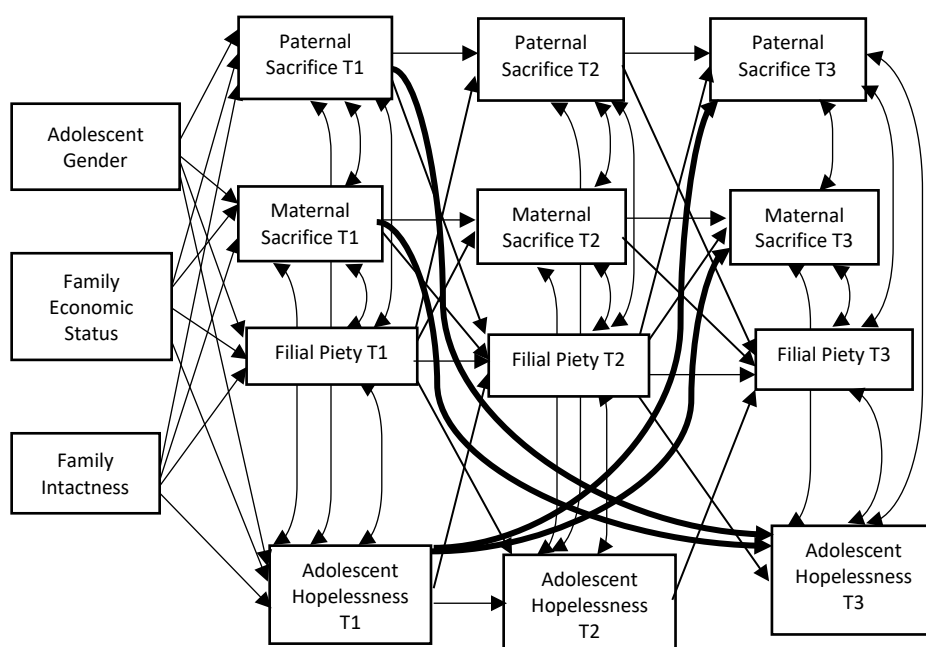


Figure 2: Final model of the relationship among parental (paternal and maternal) sacrifice, filial piety and adolescent hopelessness in Chinese communities

