

Research Article

## Filial Piety Discrepancy and Wellbeing among Older Chinese Immigrants Living in Canada: The Role of Acculturation and Living Arrangement

Vivian Huang, Alexandra J. Fiocco \*

Department of Psychology, Toronto Metropolitan University, Toronto Ontario, Canada; E-Mails: [star.lab@torontomu.ca](mailto:star.lab@torontomu.ca); [afiocco@torontomu.ca](mailto:afiocco@torontomu.ca)\* **Correspondence:** Alexandra J. Fiocco; E-Mail: [afiocco@torontomu.ca](mailto:afiocco@torontomu.ca)**Academic Editors:** Yasuhiro Kotera, Muhammad Aledeh, Kristian Barnes, Matthew Cotterill and Julie Beaumont**Special Issue:** [Cross-cultural Understanding of Positive Mental Health](#)*OBM Integrative and Complementary Medicine*  
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### Abstract

This survey-based, cross-sectional study explored the independent and synergistic effect of filial piety discrepancy (FPD), acculturation, and living arrangement on the psychological, social, and physical wellbeing of older Chinese immigrants living in Canada. A total of 299 older Chinese immigrants were recruited from community organizations in the Greater Toronto Area. Participants completed questionnaires that assessed demographic information, filial piety, living arrangement, acculturation, and three domains of wellbeing. Greater FPD was associated with lower self-reported psychological, social, and physical wellbeing. Co-residence with adult children was also associated with greater psychological wellbeing. Although living arrangement did not moderate the association between FPD and wellbeing, a significant interaction between FPD and acculturation indicated that the association between greater FPD and poorer psychological wellbeing was strongest for those with lower acculturation levels. This study confirms previous associations found between FPD and psychological wellbeing, and further extends this association to social and physical indices of wellbeing. Study findings further highlight the importance of acculturation in the relationship between FPD and wellbeing among older Chinese immigrants.



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## **Keywords**

Chinese immigrants; acculturation; filial piety; wellbeing

## **1. Introduction**

Between 2001 and 2021, older adult Chinese immigrants contributed to a 166% growth in the Canadian population [1]. With a rise in the aging population and the recognition that culture contributes to wellbeing [2], it is important to elucidate sociocultural factors that may contribute to the wellbeing of older Chinese immigrants. One cultural practice that has received considerable attention is filial piety, a virtue of unconditional respect and support for one's parents that is comprised of a complex set of responsibilities and obligations that determine family structure and intergenerational communication [3, 4]. Specifically, younger generations are expected to be respectful, caring, and obedient to their parents and older family members and to provide material and emotional supports to their aging parents [4]. As a core cultural practice, filial piety is proposed to promote psychological wellbeing within the aging Chinese population [5, 6].

Earlier research on the association between filial piety behavior and wellbeing among Chinese older adults has largely focused on the relationship between psychological wellbeing and either filial piety receipt (i.e., the degree to which children engage in filial piety behaviors for their aging parents; [7, 8]) or filial piety expectations (i.e., the degree to which the parent expects their children to be filial pious; [9, 10]). Although most studies suggest that filial piety receipt is a determinant of wellbeing (e.g., [7]), the perception of adequate filial piety receipt may be determined by the filial expectations of older Chinese immigrants. More recently, researchers have acknowledged the important distinction between expectations and actual receipt of filial piety and how discrepancy between these two constructs may be associated with psychological wellbeing [11, 12].

According to the Multiple Discrepancy Theory (MDT) [13], the dissonance between what an individual wants and what an individual receives serves as the greatest determinant of wellbeing and life satisfaction. In the context of filial piety, it is highly plausible that it is not the receipt or expectation of filial piety alone that contributes to wellbeing, but rather congruency between the two constructs. Chen and Chan [11] were the first to apply MDT in the context of filial piety by examining the degree to which older adults in Hong Kong felt that their filial expectations were being satisfied by their adult children. The authors found that older adults who reported greater filial piety discrepancy (FPD) also reported poorer psychological wellbeing [11]. In a qualitative study of Chinese American immigrants, older adults who expressed that their filial needs were not being addressed also shared feelings of distress, fear of isolation, and lower use of healthcare services in the host country [14]. A follow-up quantitative cross-sectional study by the same research group found that greater FPD (defined as higher filial expectations and lower filial receipt) was associated with greater depressive symptoms [12]. Based on these findings, it is suggested that FPD may exert a deleterious effect on the health and wellbeing of older Chinese immigrants. However, most research to date has focused on psychological wellbeing, without considering other domains of wellbeing, including physical and social wellbeing, which allows for a more holistic evaluation.

In addition to examining the discrepancy between filial piety expectations and receipt, it is important to consider one's surrounding sociocultural environment [15]. According to

Bronfenbrenner's Ecological Systems Theory [16], there are mutual interactions between individuals and their surrounding environment. Various levels of nested and interconnected systems interact to influence wellbeing [16]. Individuals are nested within a microsystem (e.g., the parent-child relationship), which is then nested in a mesosystem (e.g., the home environment); followed by the exosystem (e.g., community services), the macrosystem (i.e., social and cultural values of the host country), and the chronosystem (i.e., changes over time). In the context of wellbeing among older Chinese immigrants, the influence of FPD (i.e., microsystem) may interact with the individual's living arrangement (i.e., living alone or with children; mesosystem) and the dominant culture of the host country (i.e., macrosystem).

Cultural adaptation is suggested to promote the wellbeing of older ethnic minority immigrants [17, 18] and is commonly referred to as acculturation [19], which may be defined as the degree to which an individual is able to incorporate the beliefs, customs, and values of the host culture into their heritage culture [20]. Research suggests that lower acculturation among older Chinese immigrants is associated with poorer psychological [21] and physical wellbeing [22, 23]. In the context of immigration, the practice and acquisition of filial piety may differ depending on the acculturation level of older Chinese immigrants and the imposing social norms of the host country. In a study of older Chinese American immigrants, it was found that longer duration of residence in the host country was associated with lower perceived receipt of filial piety from one's child but did not correlate with expectations of filial piety [24]. Although filial expectations of the parent may not change after immigrating [9], acculturation level may moderate the potential negative effect of FPD on wellbeing. For example, older Chinese immigrants who are more acculturated to the host country may more readily seek support from alternative sources in their community to fulfill their unmet filial needs [24]. Despite evidence suggesting that acculturation level is associated with wellbeing, no research to date has examined whether acculturation to the host country moderates the practice of FPD and its association with wellbeing among older Chinese immigrants.

The impact of FPD on wellbeing may further be influenced by factors at the mesosystem level, such as living arrangement. Research suggests that, compared with their White counterparts, older Chinese immigrants are more likely to live with their adult children [3, 25]. Co-residence with adult children is *traditionally* considered an integral part of filial piety and has previously been associated with lower levels of loneliness, depression, and better quality of life [26]. However, due to the shift in social practices and financial independence among older Chinese immigrants, co-residence is no longer an integral part of filial piety practices [25, 27]. Past findings suggest that many older Chinese immigrants prefer not to live with their children as they wish to maintain autonomy and minimize conflict [26, 28, 29]. However, decisions surrounding living arrangement may be determined by economic and housing constraints [30]. It is suggested that older Chinese immigrants who co-reside with their adult children are more likely to experience intergenerational tension due to differences in cultural and lifestyle practices [28], which may leave older Chinese immigrants feeling devalued and not respected by their children [30, 31], which may influence their sense of wellbeing. Indeed, co-residence has been found to associate with poorer psychological wellbeing and quality of life compared to those who live independently with their spouse [28, 31, 32]. As such, the negative association between FPD and indices of wellbeing may be exacerbated among older Chinese immigrants who co-reside with their adult children. However, no research to date has examined the moderating role of living arrangement in the association between FPD and indices of wellbeing.

Wellbeing is a multifaceted construct, comprising psychological, social, and physical components. Psychological wellbeing may be characterized as positive and negative affective states such as feelings of happiness, sadness, and anger [33, 34]; social wellbeing encompasses the quality of relationships that individuals have with other people, the neighborhood, and the community [35]; and physical wellbeing may be characterized as the ability to perform activities without the interference of physical limitations and experiences of bodily pain [36]. Although each component may seem orthogonal in nature, physical, social, and psychological wellbeing are dynamic, interconnected constructs that play significant roles in human functioning [37, 38]. Accordingly, it is important to study wellbeing using a comprehensive approach.

The objective of the current study was to address current gaps in the literature, to better understand the association between FPD and indices of wellbeing in older Canadian immigrants. Building the extant literature that have focused on psychological outcomes, this study examined the association between FPD and three indices of wellbeing, including psychological, physical, and social wellbeing. It was hypothesized that greater FPD would associate with lower self-reported wellbeing across all indices of wellbeing. This study also aimed to understand potential synergistic associations between sociocultural factors by examining the moderating role of acculturation and living arrangement in the association between FPD and indices of wellbeing. It was hypothesized that the association between greater FPD and poorer wellbeing would be buffered by greater acculturation and based on contemporary discourse, living independently without children. Elucidating these interactive effects is necessary to provide a comprehensive understanding of sociocultural influences on the wellbeing of older Chinese Canadian immigrants and may have important implications for the development of culturally appropriate immigrant settlement services and resources that support the wellbeing of older Chinese immigrants.

## **2. Materials and Methods**

### **2.1 Participants and Procedure**

A total of 304 Chinese older adult Canadian immigrants (mean age = 71.85, SD = 6.68, range = 60-90) were recruited from Chinese senior associations and community organizations in the Greater Toronto Area. An a priori linear multiple regression power calculation via G\*Power ([39]; small effect size = 0.05,  $\alpha = 0.05$ ,  $1 - \beta = 0.80$ ) indicated a total sample size of 295. To account for a 10% incomplete response rate, the recruitment goal was 307 participants. Chinese immigrants aged 60 years of age or older who had at least one living child, and who were able to read and understand English or Chinese were invited to participate in this survey-based study between February 2017 and July 2018. This study was approved by the Research Ethics Board (REB 2016-322). All participants provided consent before completing the questionnaire package.

### **2.2 Measures**

All study documents and questionnaires were translated according to the World Health Organization's guidelines [40]. Two bilingual translators independently conducted forward and backward translations. Meetings were held between the translators and the first author to discuss any discrepancies between the back-translation and the original scale, as well as to ensure the

linguistic equivalence and the cultural appropriateness of the Chinese documents. All questionnaires were offered in traditional and simplified Chinese.

### 2.2.1 Sample Demographics and Living Arrangement

A demographics questionnaire was administered to index age, sex, education level (below high school, high school or equivalent, university or higher educational attainment), marital status (married, separated/divorced, widowed), perceived socioeconomic status (SES; rated as low, medium, or high), duration living in the host country, English fluency, number of children, and living arrangement. Living arrangement was categorized as “lives with adult children” or “lives alone or with spouse”. This categorical variable served as a moderator in the current study analysis.

### 2.2.2 Filial Piety Discrepancy

Two measures of filial piety were administered to calculate FPD. The Perceived Receipt of Filial Piety Scale (PRFPS; [41]) is a 10-item self-report questionnaire that measures perceived receipt level of filial piety from the perspective of the older Chinese parent. Items were designed to assess how often the respondent perceives their child(ren) to perform specific filial behaviours. Each item is measured on a 7-point Likert-scale, ranging from 1 (Never/0% of the time) to 7 (Every time/100% of the time). The total score ranges from 10 to 70, with a higher total score representing higher perceived levels of filial piety receipt. The PRFPS demonstrated excellent internal consistency in the current sample ( $\alpha = 0.93$ , 95% CI [0.92, 0.94]).

The Filial Piety Expectation Scale (FPES; [9]) is a 10-item questionnaire that measures filial piety expectation and non-expectations of older adults. Each item is answered on a 5-point Likert-type scale from 1 (Strongly disagree) to 5 (Strongly agree). Higher total subscale scores are indicative of higher endorsement of filial piety expectation or non-expectation. The FPES demonstrated good internal consistency for both subscales in the current sample (expectation:  $\alpha = 0.87$ , 95% CI [0.85, 0.89]; non-expectation:  $\alpha = 0.73$ , 95% CI [0.68, 0.78]).

Total scores on the PRFPS and FPES were standardized to create a total FPD score. The FPD score was calculated by subtracting the standardized FPES expectation subscale score from the standardized PRFPS score, with a higher FPD indicative of greater filial expectation and lower perceived receipt of filial piety.

### 2.2.3 Acculturation

Acculturation was measured using the Vancouver Index of Acculturation (VIA; [42]). The VIA is a 20-item questionnaire that measures heritage and mainstream cultural change in the domains of values, social relationships, and adherence to traditions. The VIA contains two subscales: enculturation (i.e., the practice of heritage culture) and acculturation (i.e., the practice of mainstream culture). Each item is answered on a 9-point Likert-type scale, ranging from 1 (Extremely disagree) to 9 (Extremely agree). Each subscale score ranges from 10 to 90, with higher scores on both subscales indicating higher level of enculturation and acculturation. The VIA demonstrated good internal consistency in the current sample (Enculturation:  $\alpha = 0.87$ , 95% CI [0.85, 0.89]; Acculturation:  $\alpha = 0.85$ , 95% CI [0.83, 0.88]). The current study only utilized the acculturation subscale as a measure of acculturation, which served as a moderator in the current study analysis.

#### 2.2.4 Indices of Wellbeing

Psychological Wellbeing Domain. Psychological wellbeing was operationalized as the extent to which individuals experience psychological distress and depressive symptoms. A composite psychological wellbeing domain score was created using z-score from two standardized questionnaire: the Chinese version of the 20-item Center for Epidemiologic Studies Depression Scale (CES-D; [43]) and the Chinese version of the 10-item Perceived Stress Scale (PSS-10, [8]). The CES-D, which measures the frequency and severity of depressive symptoms in the past week, demonstrated good internal consistency in the current sample ( $\alpha = 0.84$ , 95% CI [0.82, 0.87]); the PSS-10, which measures the degree to which a person perceives various aspects of life as uncontrollable, unpredictable, and overloading within the last month, demonstrated acceptable internal consistency in the current sample ( $\alpha = 0.76$ , 95% CI [0.72, 0.78]). Total scores on the CES-D and PSS-10 were standardized and summed to create the psychological wellbeing domain score, with a higher domain score indicative of poorer psychological wellbeing.

Social Wellbeing Domain. Social wellbeing was operationalized as the extent to which individuals perceive that they have a strong social network and feel socially supported [35]. A composite social wellbeing domain score was created using z-scores from two standardized questionnaires: the Chinese version of the 12-item Multidimensional Scale of Perceived Social Support (MSPSS) [44] and the Chinese translation of the 11-item Berman-Syme Social Network Index (SNI; [45]). The MSPSS, which measures the perception of social support from family, friends, and significant others, demonstrated excellent internal consistency for subscale scores and the total score in the current sample ( $\alpha = 0.93$ , 95% CI for PSSA total score [0.92, 0.94]). The SNI, which measures size of an individual's social network across four types of social connections (marital, sociability, church group membership, and community organization membership), demonstrated good internal consistency in the current sample ( $\alpha = 0.81$ , 95% CI [0.78, 0.84]). The total scores on the MSPSS and SNI were standardized and summed to create the social wellbeing domain score. A higher domain score was indicative of better social wellbeing.

Physical Wellbeing Domain. Physical wellbeing was operationalized as the extent to which individuals are actively engaged in activities without the interference of physical limitations or experience of bodily pain [36]. Physical wellbeing was measured using the Chinese version of the 10-item SF-36 Physical Component Scale [46], which has demonstrated good psychometric properties in Chinese populations [47]. The SF-36 demonstrated good internal consistency in the current sample, with Cronbach's alphas of all the subscales ranging from 0.72 to 0.90. To reflect physical wellbeing as operationalized in the current study, only the Physical Component Score (PCS) of the SF-36 was used. Specifically, the physical component score reflects physical functioning, and active engagement due to physical problems, bodily pain, and general health. A higher score indicates better physical wellbeing.

Spearman's correlations suggested divergence amongst the wellbeing domain scores, with measures yielding non-significant, negative, or weak associations.

## **2.3 Data Analyses**

Descriptive statistics were conducted to ensure all measures met statistical assumptions for parametric analyses. Analysis of missing data showed that 6 participants had 10% or more incomplete data, and thus were removed from subsequent analyses. This resulted in a final sample size of 299 participants. Available item analysis was used to treat item-level missing data, such that scale-level scores were calculated based on the available number of items for each participant [48].

Bivariate correlations were conducted to examine the relationship between sociocultural factors in the current sample. To examine the direct association between FPD and wellbeing, three multiple regressions were conducted between FPD and each domain of wellbeing, controlling for age, sex, education, and perceived SES.

To examine the interactive effect of FPD, acculturation level, and living arrangement on each domain of wellbeing, three additional multiple regression analyses were performed. Within each model, a priori covariates of age, sex, education, and perceived SES were entered in Step 1 of the regression model. In Step 2, main effect variables of FPD, acculturation (mean-centered), and living arrangement were entered. To examine the interaction between FPD and modifying factors of acculturation and living arrangement, two-way interactions between the three sociocultural factors were entered in Step 3, and a final 3-way interaction term was entered in Step 4. All analyses were performed using SPSS version 22. An alpha level of 0.05 was used to determine statistical significance for all analyses.

## **3. Results**

### **3.1 Sample Characteristics**

The average age of the sample was 71.81 (SD = 6.69). Women accounted for more than half of the sample (59.6%), 76.9% were married, and 37.5% completed university. The majority of participants (75.8%) were born in Mainland China. With regards to living arrangement, 59.1% either lived alone or lived with a spouse without children, and 40.9% lived with children. The average duration in Canada was 16.25 years (SD = 12.89; range = 0.13-57), and the average age at the time of immigration was 55.98 years (SD = 15.74; range = 5-81). Despite the long duration in Canada, 64.2% of participants reported none to low English fluency and 96.0% of the participants completed the questionnaires in Chinese. Please see Table 1 for more detailed information.

**Table 1** Sample Characteristics (N = 299).

Sample Characteristic	Mean (SD) or %
Age	71.81 (6.69)
Sex (% female)	59.6
Education	
Less than high school	17.0
High school or equivalent	45.5
University or higher	37.5
Living arrangement	
Lives with children	40.9
Lives alone or with spouse	59.1
Socioeconomic status	
Low	59.0
Medium or high	41.0
Parity	1.9 (0.87)
Home county	
Mainland China	75.25
Hong Kong	19.73
Other	4.34
Duration in host county	16.25 (12.96)
Acculturation	52.66 (12.32)
Enculturation	72.08 (10.00)
Age at immigration	55.98 (15.74)
English fluency	
None to Low	64.2
Medium to high	35.8

### 3.2 Bivariate Correlations

Spearman’s correlations were conducted to examine the relationship between the sociocultural factors of interest and demographic factors, including age, sex, perceived SES, duration in host country, and number of children. Results showed that FPD was not correlated with any of the demographic variables and sociocultural factors ( $p$  s > 0.05). Higher level of acculturation was associated with younger age ( $r_s = -0.13, p = 0.02$ ), longer duration residing in Canada ( $r_s = 0.24, p < 0.001$ ), and higher perceived SES ( $r_s = 0.17, p = 0.003$ ). Co-residence with adult children was associated with younger age ( $r_s = -0.13, p = 0.02$ ), fewer children ( $r_s = -0.18, p = 0.002$ ), shorter duration living in the host country ( $r_s = -0.35, p < 0.001$ ), and higher enculturation level ( $r_s = 0.13, p = 0.02$ ). See Table 2 for a detailed correlation matrix.



**Table 2** Correlations between sociocultural factors and sample characteristics.

	1	2	3	4	5	6	7	8	9
1. Age	-								
2. Female Sex	-0.18**	-							
3. Education	0.26***	-0.13*	-						
4. Lives with children	-0.14*	0.03	-0.05	-					
5. SES	-0.16**	0.04	0.003	-0.11	-				
6. Parity	0.25***	-0.01	-0.15**	-0.18**	-0.05	-			
7. Duration in host county	-0.10	0.04	-0.07	-0.35***	0.15*	0.31**	-		
8. Acculturation	-0.13*	-0.11	0.02	-0.07	0.17**	0.01	0.24***	-	
9. Enculturation	0.07	0.02	-0.07	0.13*	0.04	0.07	-0.04	0.06	-
10. FPD	-0.06	-0.03	-0.03	-0.01	-0.08	0.04	0.03	0.02	0.02

Notes. FPD = Filial piety discrepancy. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

### 3.3 Association between FPD and Three Domains of Wellbeing

Controlling for age, sex, education, and perceived SES, independent regression models revealed that greater FPD was significantly associated with 1) poorer psychological wellbeing ( $\beta = 0.34$ ,  $t = 6.22$ ,  $p < 0.001$ ), wherein a 1 unit increase in FPD was associated with a 0.34 unit increase in the psychological wellbeing composite score, suggesting lower psychological wellbeing; 2) poorer social wellbeing ( $\beta = -0.15$ ,  $t = -2.60$ ,  $p = 0.01$ ), wherein a 1 unit increase in FPD was associated with a 0.15 unit decrease in social wellbeing; and 3) poorer physical wellbeing ( $\beta = -0.15$ ,  $t = -2.60$ ,  $p = 0.01$ ), wherein a 1 unit increase in FPD was associated with a 0.15 unit decrease in physical wellbeing.

### 3.4 Moderating Role of Acculturation and Living Arrangement on the Relationship Between FPD and Indices of Wellbeing

To examine the moderating role of acculturation level and living arrangement on the association between FPD and indices of wellbeing, findings of step 3 (two-way interactions) and 4 (three-way interaction) of the four-step hierarchical regression models are presented below.

#### 3.4.1 Psychological Wellbeing Domain

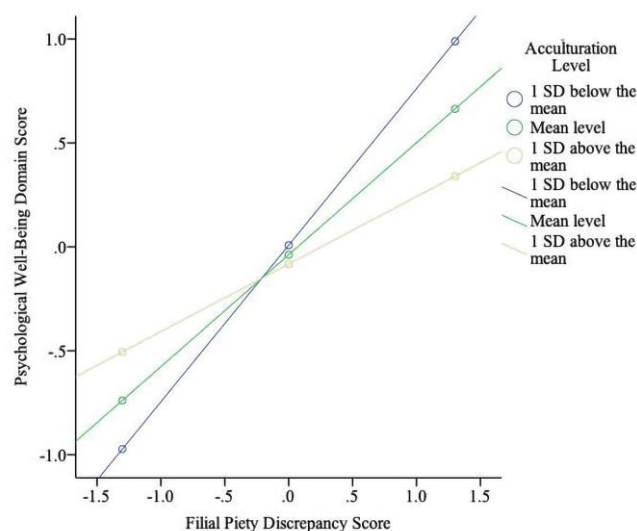
Adjusting for age, sex, education, and perceived SES, the initial four-step model revealed that the three-way interaction between FPD, acculturation, and living arrangement did not account for additional variance in psychological wellbeing, either as a step in the model ( $F(1, 276) = 0.58$ ,  $p = 0.45$ ) or independently ( $\beta = 0.05$ ,  $t = 0.76$ ,  $p = 0.45$ ), thus it was removed from subsequent model analysis. The final and most parsimonious model included main effects and a two-way interaction (FPD  $\times$  acculturation) in a three-step model (Table 3). Please see Supplementary Material for overall model estimations.

**Table 3** Hierarchical Regression Analysis of FPD and Psychological Wellbeing.

Title 1	Step 1	Step 2	Step 3
Age	-0.05	-0.03	-0.02
Sex (1, female; 0, male)	0.07	0.08	0.08
Education			
Below High school	0.15	0.12	0.13
High school or equivalent	0.02	-0.03	-0.004
University or above	0.07	0.005	0.03
Perceived SES			
Low	0.10	0.10	0.08
Medium	-0.09	-0.05	-0.07
FPD		0.33**	0.35
Acculturation		-0.01	-0.008
Living arrangement (1, live with adult children; 0, live alone or with spouse)		-0.13*	-0.14*
FPD × Acculturation			-0.69*
$R^2$	0.06	0.19	0.20
$\Delta R^2$		0.13 <sup>a</sup>	0.01 <sup>b</sup>

\* Notes. FPD = Filial piety discrepancy; SES = Socioeconomic status; \*  $p < 0.05$ , \*\*  $p < 0.001$ ; a.  $F(3, 280) = 14.52, p < 0.001$ ; b.  $F(1, 279) = 4.28, p = 0.04$

The final model revealed a significant two-way interaction between FPD and acculturation on psychological wellbeing ( $\beta = -0.69, t = -2.07, p = 0.04$ ). As shown in Figure 1, the association between FPD and psychological wellbeing was dependent on level of acculturation, such that the association between FPD and poor psychological wellbeing was exacerbated in participants with low acculturation levels but minimized among participants with a higher acculturation level.



**Figure 1** Conditional effect of FPD and psychological wellbeing across level of acculturation.

### 3.4.2 Social Wellbeing Domain

Adjusting for age, sex, education, and perceived SES, the three-way interaction between FPD, acculturation level, and living arrangement did not significantly explain additional variance in social wellbeing, either as a step in the model ( $F(1, 275) = 0.02, p = 0.88$ ) or independently ( $\beta = -0.01, t = -0.15, p = 0.88$ ). Similarly, the two-way interaction terms did not account for additional variance in social wellbeing as a step in the model ( $F(3, 276) = 0.39, p = 0.76$ ) or independently (FPD  $\times$  acculturation:  $\beta = -0.03, t = -0.08, p = 0.94$ ; FPD  $\times$  living arrangement:  $\beta = 0.06, t = 0.88, p = 0.38$ ; and acculturation  $\times$  living arrangement:  $\beta = -0.26, t = -0.80, p = 0.42$ ). Thus, acculturation and living arrangement did not significantly moderate the relationship between FPD and social wellbeing among older Chinese immigrants. Furthermore, no significant main effects of living arrangement or acculturation were found. See Supplementary Materials for detailed results.

### 3.4.3 Physical Wellbeing Domain

Adjusting for age, sex, education, and perceived SES, the three-way interaction between FPD, acculturation level, and living arrangement did not significantly explain additional variance in physical wellbeing, either as a step in the model ( $F(1, 274) = 1.37, p = 0.24$ ) or independently ( $\beta = -0.08, t = -1.17, p = 0.24$ ). Similarly, the two-way interaction terms did not significantly account for additional variance in physical wellbeing as a step in the model ( $F(3, 275) = 0.92, p = 0.43$ ), or independently (FPD  $\times$  acculturation:  $\beta = 0.44, t = 1.29, p = 0.20$ ; FPD  $\times$  living arrangement:  $\beta = 0.02, t = 0.23, p = 0.82$ ; and acculturation  $\times$  living arrangement:  $\beta = -0.38, t = -1.24, p = 0.22$ ). As such, acculturation and living arrangement did not significantly moderate the relationship between FPD and physical wellbeing. However, a significant main effect of living arrangement on physical wellbeing was found ( $\beta = 0.19, t = 3.32, p = 0.001$ ), whereby co-residence with adult children was associated with a 0.19 unit increase in physical wellbeing. See in Supplementary Materials for detailed results.

## 4. Discussion

Filial piety serves as a core aspect of the parent-child relationship in Chinese culture and is suggested to play a crucial role in the overall wellbeing of older Chinese immigrants. To date, there are only two studies that have directly examined the association between FPD and psychological wellbeing: the first in a sample of Chinese older adults in Hong Kong, and the second in a sample of older Chinese immigrants in the United States [11, 12]. The current study sought to expand on previous research by examining the relationship between FPD and wellbeing across domains of psychological, social, and physical wellbeing; and to determine whether acculturation and living arrangement moderate the relationship between FPD and indices of wellbeing among older Chinese immigrants living in Canada.

As expected and consistent with previous findings [11, 12], greater FPD associated with poorer psychological wellbeing among older Chinese Canadian immigrants. The current study also provides new insight, suggesting that FPD may associate with other domains of wellbeing, including social and physical wellbeing. Although these two domains of wellbeing have not been investigated in the context of FPD, each domain uniquely contributes to one's quality of life [33, 34]. As such, it is

important to take a more comprehensive approach to determine whether FPD independently associates with each domain of wellbeing.

FPD may have independent direct effects on the physical and social wellbeing of older Chinese immigrants. It is suggested that older adults in Mainland China who report having less filial children are less likely to access the healthcare system [49]. In the context of Canadian immigrants, older Chinese immigrants may lack the knowledge and linguistic ability to navigate mainstream healthcare systems, resulting in overreliance on their adult children [50]. As such, without assistance from their children, older adult Chinese immigrants may face challenges in accessing healthcare services, resulting in poorer physical wellbeing. It is also plausible that FPD has a direct effect on the social wellbeing of older Chinese immigrants. It is suggested that minority older adults are more likely to have a smaller social network and are more reliant on kin-based social connections [50, 51]. Thus, older Chinese immigrants who are dependent on kin-based relationships and who experience FPD may be especially vulnerable to experiencing poor social wellbeing. However, additional research is needed, employing more robust prospective research designs.

Inconsistent with previous research, greater acculturation did not associate with better psychological wellbeing [21], nor did it associate with better social or physical wellbeing. Null associations may stem from the complexity of acculturation, which may be influenced by demographic or contextual factors [52], including the country and local community in which they have settled. Older Chinese immigrants who reside in ethnic enclaves, where the majority of residents are from China, may allow for the preservation of Chinese cultural practices and minimize the general benefits of acculturation [53]. Indeed, the current study was conducted within the *ethnoburbs* of the Greater Toronto Area wherein the largest minority groups are Chinese (see [54]).

Although level of acculturation did not associate with domains of wellbeing, co-residing with adult children was associated with better psychological and physical wellbeing. This finding is inconsistent with previous research conducted in older Chinese immigrants living in the United States (e.g., [30]); however, it is aligned with research conducted in Chinese-speaking countries, which report that co-residence is associated with social support and the promotion of healthy lifestyle behaviors, which in turn exerts a protective effect on health outcomes [32, 55]. In the context of the current findings, it is important to note that Chinese older adults who co-resided with their adult children were more likely to be younger, lived in Canada for a shorter duration, and reported higher levels of enculturation (i.e., maintaining one's heritage cultural practice). Together, these factors may have influenced the relationship between co-residence and wellbeing through the "healthy immigrant effect" [56]. Indeed, there is some evidence to suggest that newly arrived immigrants to Canada are, on average, healthier than the Canadian-born population, which then declines as duration living in Canada increases [26, 56]. Accordingly, participants who reported living with their children may have reported better psychological and physical wellbeing because they were younger and had lived in Canada for a shorter duration compared with participants who lived without their adult children. It is also important to note that the current study did not assess living arrangement history or preference, which may differentially associate with wellbeing compared with actual living arrangement [29]. It is possible that changes in living arrangement following immigration to Canada, such as transitioning from independent living to living with children, may impact intergenerational dynamics [30]. Such changes in living arrangement may subsequently influence the perception of filial piety and the wellbeing of older Chinese immigrants. Accordingly,

future research should further disentangle living arrangement by examining preference and actual residential arrangement in the relationship between FPD and wellbeing in this population.

The present study did not find a synergistic association between all three sociocultural factors of interest; however, a novel moderating role of acculturation in the relationship between FPD and psychological wellbeing was found. Specifically, low levels of acculturation were found to exacerbate the negative impact of FPD on psychological wellbeing, whereas higher levels of acculturation minimized this association. As suggested by the ecological systems theory [16], various levels of nested and interconnected systems interact to influence the wellbeing of individuals. In the context of the current study, the micro-system (i.e., parent-child relationship as reflected in FPD) interacted with the macro-system (i.e., mainstream cultural context of the host country or acculturation) to influence the wellbeing of older Chinese immigrants. Acculturation may be challenging for older Chinese immigrants due to language barriers, being unfamiliar with the host culture and customs, and due to disruptions in their social support system [18, 57]. Intergenerational differences in acculturation uptake within the household may give rise to family conflict [28, 58]. While older Chinese immigrants may continue to abide by traditional practices of filial piety [9], their adult children may place less emphasis on filial piety and engagement in filial behaviours as they adopt to a more individualistic culture [24]. Consequently, older Chinese immigrants may experience greater FPD as the cultural gap grows between their adult children and themselves, which may further contribute to poorer psychological wellbeing. It is suggested that older Chinese immigrants with higher levels of acculturation may alter their practice of filial piety by seeking support from alternative sources to fulfill their unmet filial needs (e.g., friends and neighbours), which may then facilitate psychological wellbeing (e.g., [24]). This is aligned with previous research by Chen and colleagues [59], which found that higher self-reported acculturation among older Chinese immigrants mitigated the negative effect of family strain on quality of life. As such, the present study identifies a vulnerable group of older Chinese immigrants who may be at increased risk for poor psychological wellbeing due to FPD in the context of low acculturation.

Together, the current findings provide new insight into the association between FPD and wellbeing. While these findings are novel and contribute to the growing body of literature examining sociocultural correlates of wellbeing among aging Chinese immigrants, the current findings should be interpreted with caution in light of several study limitations. First, the correlational and cross-sectional nature of the study's design precludes the examination of causal relationships between sociocultural factors and wellbeing. Although the current study and previous literature assumes a predictive effect of FPD on wellbeing, it is possible that the relationship between FPD and psychological wellbeing is bidirectional. It is well documented that increased depressive symptoms are associated with negative biased thinking [60, 61], which may affect how an individual perceives the self, others, and the world [62]. As such, it is possible that older Chinese immigrants with poor psychological wellbeing engage in negative cognitive biases and are more likely to perceive FPD, which in turn may further exacerbate their psychological wellbeing. Due to the cross-sectional nature of the current study and previous research, disentangling the directionality of these constructs remains elusive and requires further investigation. More specifically, prospective, longitudinal studies are needed to further examine the complex interplay between FPD and wellbeing over time.

Method of data collection is the second study limitation that must be noted. Participants completed the questionnaire package in groups of 10 participants at a time. Although group testing

greatly facilitated the feasibility of collecting a large sample size in a shorter period of time, it may have enhanced social desirability bias. Further, there is some debate as to whether data collection through interview format is better than the administration of questionnaires [63]. Lastly, study characteristics may have influenced study findings. The study sample included relatively healthy and socially active older Chinese immigrants. Not only does this prevent generalizability of study findings to older Chinese immigrants who are socially isolated or those with chronic illness and limited mobility, sample characteristics may have also minimized true associations between the tested sociocultural factors and domains of wellbeing. This study also did not differentiate between persons living without children who are living alone or with a spouse. Experiences of loneliness and need for filial children may differ between these two living circumstances. The null synergistic association between FPD, living arrangement, acculturation, and indices of wellbeing may be due to measurement error, sampling biases, or statistical power. As such, additional research is needed to replicate the current findings and to further explore the interplay between FPD, acculturation, living arrangement, and different domains of wellbeing. Future studies may extend this line of research by comparing the aforementioned relationship between recent immigrants to Canada and older Chinese immigrants who have lived in the country for a longer period of time. Moreover, longitudinal and mixed-methods approaches may shed light on the dynamic interplay between sociocultural factors and wellbeing over time.

## **5. Conclusions**

With the aging population becoming increasingly diverse, it is imperative to explore the various cultural factors that contribute to the wellbeing of ethnic minority older adults in Canada. Despite the aforementioned limitations, the current study is important as it suggests that FPD may negatively impact multiple domains of wellbeing. The current findings further highlight the importance of other sociocultural factors that may enhance or minimize the association between FPD and wellbeing. Additional research is needed to further delineate the interplay between important sociocultural factors and wellbeing, which in turn may aid in the development of strategies that foster the wellbeing of aging Chinese immigrants. This particular line of research may have important implications for immigrant settlement services and the development of appropriate educational resources to help maintain or enhance the wellbeing of older Chinese immigrants, especially those with unmet filial piety needs and those who are experiencing difficulty with adapting to the host country.

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## Author Contributions

VH conceptualized the study, collected the data, ran the analyses, and wrote the manuscript. AJF supervised VH, contributed to writing the manuscript and prepared the final manuscript submission.

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## Competing Interests

The authors have declared that no competing interests exist.

## Data Availability Statement

Please send requests for de-identified data to the corresponding author ([afiocco@torontomy.ca](mailto:afiocco@torontomy.ca)). Of note, data were collected before the implementation of ethical open-data policies at Toronto Metropolitan University. Accordingly, participants of this study did not consent to having their data uploaded to an open science repository.

## Additional Materials

The following additional materials are uploaded at the page of this paper.

1. Supplementary Material.

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