

*Research article*

## **Personality Traits among Community-Dwelling Chinese Older Adults in the Greater Chicago Area**

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**Abstract: Objectives:** Personality traits are important indicators of health and well-being. Neuroticism and conscientiousness in particular, are closely associated with morbidity and mortality in old age. However, little is known regarding the levels of these two key personality traits among U.S. Chinese older adults. This report aimed to examine the levels of personality traits among this population. **Methods:** Data were from the PINE study, a population-based study of U.S. Chinese older adults aged 60 and above. We measured neuroticism and conscientiousness using modified NEO personality inventory. **Results:** Of the 3,159 community-dwelling Chinese older adults, 58.9% were female, and mean age was 72.8 years. Compared to neuroticism, conscientiousness trait was endorsed higher among Chinese older adults in our sample. Each conscientiousness item had at least 67.8% of participant endorsement, in comparison to the lowest endorsement rate of 14.3% in the neuroticism measure. Younger age ( $r$ -neuroticism = -0.06,  $r$ -conscientiousness = -0.14) and fewer children ( $r$ -neuroticism = -0.06,  $r$ -conscientiousness = -0.06) were correlated with both traits. Female gender ( $r$  = 0.11), poorer health status ( $r$  = -0.26), poorer quality of life ( $r$  = -0.23) and worsened health over the past year ( $r$  = -0.15) were correlated with higher levels of neuroticism. In contrast, male gender ( $r$  = -0.05), better health status ( $r$  = 0.20), higher quality of life ( $r$  = 0.17) and improved health over the past year ( $r$  = 0.07) were correlated with higher levels of conscientiousness. Education level ( $r$  = 0.15) was positively correlated with higher levels of conscientiousness, but not with neuroticism; whereas income level ( $r$  = -0.04) was negatively correlated with neuroticism but not with conscientiousness. **Conclusion:** U.S. Chinese older adults generally possess higher agreement level on conscientiousness traits than neuroticism. Future analysis should be conducted to explore the complex associations between different personality traits among Chinese aging population, Our study also calls for further in-depth studies to understand adverse health outcomes associated with specific personality traits among minority older adults.

**Keywords:** personality traits; Chinese; older adults; population-based studies

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## 1. Introduction

Personality traits are broadly defined as a distinct set of interrelated thoughts, feelings, and behaviors [1]. When typically operationalized as independent dimensions, the five-trait model of personality- neuroticism, conscientiousness, extraversion, openness and agreeableness- have been well-established and gained scientific acceptance in the literature [2]. Furthermore, the association of five personality traits with health and well-being has been extensively investigated in population-based studies [3,4].

In particular, neuroticism and conscientiousness among older adults are reported to have close associations with mortality and morbidity. Neuroticism, also known as emotional instability, indicates the tendency to experience psychological distress [5]. Evidence suggests that presence of neuroticism is associated with more rapid cognitive function decline [6], and increases the likelihood of reporting suicide ideation in older population, as well as enhancing risk for suicidal behavior and death by suicide [7–9]. Conscientiousness, also called will, work, or dependability, is defined as having the character to be organized, achievement-minded, and diligent. Conscientiousness has been related to behaviors associated with cardiovascular health, such as smoking and exercise [10]. Epidemiologic research shows that conscientiousness is associated with a wide range of mental and physical disorders [11], disability [12], Alzheimer’s disease [13], and mortality [14,15].

Despite knowing that neuroticism and conscientiousness may influence the experience of health and aging in older population, our existing knowledge about the presence of these two traits have remained limited to the U.S. white population. Little is known regarding the levels of these two traits among racial/ethnic diverse older adults, including the Chinese community in the U.S. Culture represents a critical set of environmental influences that shape the expression and development of personality traits. Despite existing data suggest that personality trait structural is universal in general, environmental perspectives support the cultural influences would likely influence different scores in identifying with personality traits [16,17].

The Chinese community is the oldest and largest Asian American subgroup in the U.S. with the population of 4 million [18]. In total, 15.4% of Chinese immigrants in the U.S. are aged 65 or older. The rapid growth of Chinese aging population necessitates a better understanding of their health and well-being. Prior studies suggest that there are significant health disparities facing Chinese older adults. In particular, the stress of aging, compounded with migration processes, may make this group of immigrants vulnerable to psychological distresses, including depression, social isolation, and suicidal behavior [19–21]. Given the growing evidence on the personality-health relationship, the role of personality traits in aging research warrants further attention in this vulnerable community. Therefore, the objectives of this study were as follows: 1) examine the levels of personality traits endorsement including neuroticism and conscientiousness among community-dwelling Chinese older adults in the Greater Chicago area; 2) understand the correlates of neuroticism and conscientiousness among Chinese older adults.

## 2. Results

### 2.1. Population and Settings

Guided by community-based participatory research (CBPR) approach, the Population Study of Chinese Elderly in Chicago (PINE) is a population-based epidemiological study of Chinese older adults aged 60 and over in the greater Chicago area. Despite the rapid growth of Chinese aging population in recent years, systematic research on Chinese older adults was scarce.

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As a response, the purpose of the PINE study was to collect community-level data of U.S. Chinese older adults to examine the key cultural determinants of health and well-being [22]. Based on the available census data drawn from U.S. Census 2010 and a random block census project conducted in the Chinese community in Chicago, the PINE study is representative of the Chinese aging population in the greater Chicago area with respect to key demographic attributes, including age, sex, income, education, number of children, and country of origin [23].

The PINE study was initiated by a synergistic community-academic collaboration among Rush Institute for Healthy Aging, Northwestern University, and many community-based social services agencies and organizations throughout the Greater Chicago area. The research team implemented a targeted community-based recruitment strategy by first engaging community centers as our main recruitment sites throughout the Greater Chicago area. We approached eligible participants through routine social services and outreach efforts from over twenty social services agencies, community centers, health advocacy agencies, faith-based organizations, senior apartments and social clubs. The baseline data collection took place between 2011 and 2013.

Older adults who agreed to participate were then scheduled for a face-to-face in-home interview. Participants were surveyed in their preferred language and dialects including Mandarin, Cantonese, Toishanese, Teochew dialect, or English. When research assistants conducted the interview, a web-based application allowed health data to be recorded simultaneously in English, Chinese traditional and simplified characters. Out of 3,542 eligible Chinese older adults who were approached, 3,159 agreed to the study, yielding a response rate of 91.9%. All study procedures were approved by the Institutional Review Boards of the Rush University Medical Center.

## 2.2. Measurements

### 2.2.1 Socio-demographics

Basic demographic information including age, years of education completed, annual personal income (0–\$4,999 per year; \$5,000–\$9,999 per year; \$10,000–\$14,999 per year; \$15,000–\$19,999 per year; or more than \$20,000 per year), marital status (married; separated; divorced; or widowed), number of children, number of grandchildren, years in the community, and years in the U.S. were assessed in all participants. Living arrangement was recorded and categorized into four groups: (1) living alone; (2) living with 1–2 persons; (3) living with 2–3 persons; or (4) living with 4 more persons.

### 2.2.2 Overall health status, quality of life and health changes over the last year

Overall health status was measured by “In general, how would you rate your health?” on a four point scale (1 = poor, 2 = fair, 3 = good, 4 = very good). Quality of life was assessed by asking “In general, how would you rate your quality of life?” also on a four point scale, ranging from 1 = poor to 4 = very good. Health changes over the last year was measured by “Compared to one year ago, how would you rate your now?” on a three point scale (1 = worsened, 2 = same, 3 = improved).

### 2.2.3 Assessment of personality traits

We assessed personality traits derived from the NEO Five-Factor Inventory (2). Participants were asked to rate their level of agreement with a total of 18 statements. Neuroticism, defined as the disposition to experience psychological distress, was assessed by using six items: (1) I am not a worrier; (2) I often feel inferior to others; (3) I often feel tense and jittery; (4) I often get angry at the way people treating me; (5) Too often, when things go wrong, I get discouraged and feel like giving

up; (6) I often feel helpless and want someone else to solve my problems.

Conscientiousness refers to the tendency to be self-disciplined, scrupulous, and purposeful. We asked participants to rate 12 statements in total: (1) I keep my belongings neat and clean; (2) I am pretty good about pacing myself so as to get things done on time; (3) I am not a very methodical person; (4) I try to perform all the tasks assigned to me conscientiously; (5) I have a clear set of goals and work toward them in an orderly fashion; (6) I waste a lot of time before settling down to work; (7) I work hard to accomplish my goals; (8) When I make a commitment, I can always be counted on to follow through; (9) Sometimes I am not as dependable or reliable as I should be; (10) I am a productive person who always gets the job done; (11) I never seem to be able to get organized; (12) I strive for excellence in everything I do.

Respondents indicated answers to each question on a 5-point scale ranging from 1 = strongly disagree to 5 = strongly agree. Item 1 in the neuroticism scale as well as items 3, 6, 9, and 11 in the conscientiousness scale was negatively worded and thus reversely coded. We created a continuous personality traits level by summing scores from the 18 items, with higher scores indicating greater agreement with the personality traits. Adequate internal reliability has been reported for the neuroticism and conscientiousness scales in previous studies of older adults with Cronbach's alpha near 0.80 [6,24].

With respect to content validity, the original English statements were first translated into Chinese by a bilingual research team. Due to the vast linguistic diversity of our study population, the Chinese version was then back translated by bilingual and bicultural investigators fluent in dialects including Mandarin and Cantonese to confirm consistency between the meaning of the Chinese version with the original English version. Both written scripts (traditional and simplified Chinese characters) were subsequently examined. A group of community stakeholders led by an experienced bilingual and bicultural geriatrician then examined the wording of the Chinese versions to ensure validity and to ascertain if the meanings of the items in Chinese conveyed the intended meanings to Chinese older adults

### 2.3 Data Analysis

We conducted uni-variate descriptive statistics to examine the socio-demographic characteristics, socioeconomic and family compositions of the PINE study participants. Internal consistency of the neuroticism and conscientiousness measures were estimated using Cronbach's alpha. Personality traits were examined as continuous scores. Total score for the 6-item-neuroticism measure ranged from 6–30, and 12–60 for the 12-item conscientiousness measure. Pearson correlation coefficients were calculated to examine associations between socio-demographic factors and the presences of two personality traits in older men and older women. All statistical analyses were carried out with SAS, Version 9.2 (SAS Institute Inc., Cary, NC).

## 3. Cerebella Neuroanatomy & Neurocircuitry

### 3.1 Sample Characteristics

Of the 3,159 participants, 58.9% were female. The mean age was 72.8 years ( $SD \pm 8.3$ ), and mean years of education was 8.7 ( $SD \pm 5.1$ ). The majority of the participants (85.1%) had an annual personal income that was less than \$10,000, and only 2.8% of the participants had an annual personal income of more than \$20,000. With respect to marital status, 71.3% participants were married, while 24.5% were widowed, 2.4% were divorced, and 1.8% was separated. More than half (55.6%) of the participants had more than three children. Twenty-one percent of the participants were living alone.

With respect to immigration status, mean years in the U.S. was 20.0 years ( $SD \pm 13.2$ ), and the majority of the participants emigrated from Mainland China (92.8%), with a smaller proportion from Hong Kong/Macau (3.3%), and Taiwan (1.3%). Regarding self-reported health status, 60.8% of the participants perceived fair or poor overall health status, 49.3% had a fair or poor quality of life, and 42.5% experienced a worsened health status.

### 3.2 Assessment of Neuroticism and Conscientiousness Items

With respect to specific endorsement of neuroticism, 35% of the participants reported that they were worriers (Table 1). A total of 25.6% of the participants felt that too often they became discouraged and felt like giving up when things went wrong. In addition, 20% often felt tense and jittery, 17.5% reported that they often felt helpless and wanted someone else to solve their problems, and 16.7% often became angry at the way people treated them.

**Table 1. Endorsement of Neuroticism Items**

	Strongly Disagree <i>N, %</i>	Disagree <i>N, %</i>	Neutral <i>N, %</i>	Agree <i>N, %</i>	Strongly Agree <i>N, %</i>
1. I am not a worrier.	280 (9.0)	812 (26.0)	352 (11.3)	1,091 (34.7)	594 (19.0)
2. I often feel inferior to others	1,015 (32.5)	1,391 (44.6)	270 (8.7)	364 (11.7)	82 (2.6)
3. I often feel tense and jittery	736 (23.5)	1,409 (45.0)	359 (11.5)	510 (16.3)	117 (3.7)
4. I often get angry at the way people treating me	759 (24.3)	1,494 (47.7)	355 (11.3)	451 (14.4)	71 (2.3)
5. Too often, when things go wrong, I get discouraged and feel like giving up	513 (16.5)	1,312 (42.1)	493 (15.8)	618 (19.9)	176 (5.7)
6. I often feel helpless and want someone else to solve my problems	764 (24.4)	1,560 (49.9)	257 (8.2)	421 (13.5)	126 (4.0)

With respect to conscientiousness, 91.2% of the participants tried to perform all the tasks assigned to them conscientiously, and 89.4% reported that when they made a commitment, they could always be counted to follow through. A total of 85.2% reported that they worked hard toward their goals; and 82.5% reported that they kept their belongings neat and clean, and 81.1% reported that they felt pretty good about pacing themselves so as to get things done on time (Table 2).

**Table 2. Endorsement of Conscientiousness Items**

	Strongly Disagree <i>N</i> , %	Disagree <i>N</i> , %	Neutral <i>N</i> , %	Agree <i>N</i> , %	Strongly Agree <i>N</i> , %
1. I keep my belonging neat and clean	34 (1.1)	187 (6.0)	328 (10.5)	1,757 (56.1)	825 (26.4)
2. I am pretty good about pacing myself so as to get things done on time	29 (0.9)	250 (8.0)	310 (10.0)	1754 (56.3)	772 (24.8)
3. I am not a very methodical person	564 (18.2)	1,541 (49.6)	432 (13.9)	483 (15.5)	88 (2.8)
4. I try to perform all the tasks assigned to me conscientiously	6 (0.2)	74 (2.4)	193 (6.2)	1,682 (54.0)	1,158 (37.2)
5. I have a clear set of goals and work toward them in an orderly fashion	62 (2.0)	480 (15.4)	454 (14.6)	1,559 (50.2)	553 (17.8)
6. I waste a lot of time before settling down to work	575 (18.5)	1,801 (58.0)	357 (11.5)	314 (10.1)	56 (1.8)
7. I work hard to accomplish my goals	25 (0.8)	155 (5.0)	282 (9.07)	1,780 (57.3)	866 (27.9)
8. When I make a commitment, I can always be counted to follow through	10 (0.3)	100 (3.2)	220 (7.06)	1,507 (48.4)	1,277 (41.0)
9. Sometimes I am not as dependable or reliable as I should be	829 (26.7)	1,593 (51.4)	254 (8.19)	274 (8.8)	152 (4.9)
10. I am a productive person who always gets the job done.	43 (1.4)	297 (9.5)	506 (16.3)	1,529 (49.1)	738 (23.7)
11. I never seem to be able to get organized	441 (14.2)	1,717 (55.2)	535 (17.2)	365 (11.7)	53 (1.7)
12. I strive for excellence in everything I do	25 (0.8)	301 (1.0)	509 (16.3)	1,476 (47.4)	797 (25.6)

### 3.3 Personality Trait Measure Reliability and Content Validity

In our PINE cohort, the alpha coefficient of reliability for the neuroticism measure was 0.65 (Table 3). The inter-item correlations among the six items ranged from 0.06 to 0.37. “Too often, when things go wrong, I get discouraged and feel like giving up” and “I often feel inferior to others” showed the highest inter-item correlation coefficients (0.37), whereas “I often feel tense and jittery” and “I am not a worrier” reported some of lowest inter-item correlation coefficients. All correlations were significant at the 0.001 level.

**Table 3. Neuroticism and Item-total Correlations and Correlation Coefficients.**

	Alpha if item removed	1	2	3	4	5	6
1. I am not a worrier.	0.65	1.0					
2. I often feel inferior to others	0.59	0.20	1.0				
3. I often feel tense and jittery	0.65	0.06	0.14	1.0			
4. I often get angry at the way people treating me	0.60	0.14	0.22	0.17	1.0		
5. Too often, when things go wrong, I get discourage and feel like giving up	0.56	0.26	0.37	0.15	0.36	1.0	
6. I often feel helpless and want someone else to solve my problems	0.56	0.17	0.34	0.31	0.30	0.32	1.0

All *P* values are significant ( $P < 0.001$ )

On the other hand, the alpha coefficient of reliability for the conscientiousness measure was reported to be 0.82 (Table 4). Items 4 (“I try to perform all the tasks assigned to me conscientiously”), 5 (“I have a clear set of goals and work toward them in an orderly fashion”), and 7 (“I work hard to accomplish my goals”) showed the some of the highest inter-item correlation coefficients, ranging from 0.45 to 0.46. All correlations were significant at the 0.001 level.

**Table 4. Conscientiousness and Item-total Correlations and Correlation Coefficients.**

	Alpha if item removed	1	2	3	4	5	6	7	8	9	10	11	12
1. I keep my belonging neat and clean	0.82	1.0											
2. I am pretty good about pacing myself so as to get things done on time	0.80	0.29	1.0										
3. I am not a very methodical person	0.81	0.24	0.38	1.0									
4. I try to perform all the tasks assigned to me conscientiously	0.80	0.25	0.38	0.38	1.0								
5. I have a clear set of goals and work toward them in an orderly fashion	0.81	0.17	0.39	0.38	0.31	1.0							
6. I waster a lot of time before settling down to work	0.81	0.16	0.24	0.39	0.28	0.21	1.0						
7. I work hard to accomplish my goals	0.80	0.21	0.39	0.29	0.46	0.44	0.23	1.0					
8. When I make a commitment, I can always be counted to follow through	0.80	0.21	0.36	0.29	0.43	0.27	0.28	0.39	1.0				
9. Sometimes I am not as dependable or reliable as I should be	0.82	0.16	0.15	0.31	0.22	0.13	0.31	0.23	0.31	1.0			
10. I am a productive person who always gets the job done.	0.81	0.19	0.37	0.22	0.34	0.35	0.27	0.37	0.37	0.21	1.0		
11. I never seem to be able to get organized	0.81	0.11	0.29	0.32	0.24	0.22	0.31	0.25	0.26	0.29	0.28	1.0	
12. I strive for excellence in everything I do	0.81	0.24	0.34	0.21	0.33	0.34	0.21	0.33	0.36	0.16	0.31	0.20	1.0

All *P* values are significant ( $P < 0.001$ ).

### 3.4 Correlation between Socio-Demographic Factors and Personality Traits

Age, sex, income, marital status, number of children, overall health status, quality of life and health changes over the last year were significantly correlated with the levels of neuroticism endorsement among participants (Table 5). Being younger ( $r = -0.06$ ), being female ( $r = 0.11$ ), having a lower income ( $r = -0.04$ ), being unmarried ( $r = -0.04$ ), having fewer children ( $r = -0.06$ ), having a worsened overall health status ( $r = -0.26$ ), having a worsened quality of life ( $r = -0.23$ ), and having a worsened health status over the last year ( $r = -0.15$ ) were likely to report higher levels of neuroticism personality traits

**Table 5. Correlations between Personality Traits and Socio-Demographic Variables.**

	Neuroticism												
	Age	Sex	Edu	Income	MS	Living	Children	Yrs in U.S.	Yrs in com	Origin	OHS	QOL	HC
Neuroticism	-0.06***	0.11***	-0.03	-0.04*	-0.05**	0.02	-0.06**	-0.01	-0.02	-0.02	-0.26***	-0.23***	-0.15***
	Conscientiousness												
Conscientiousness	-0.14***	-0.05**	0.15***	0.01	0.13***	0.07***	-0.06***	-0.11***	-0.09***	0.01	0.20***	0.17***	0.07***

Edu = Education; MS = Marital Status; Living = Living Arrangement; Children = Number of Children; Yrs in U.S. = Years in the US; Yrs in com = Years in the Community; Origin = Country of Origin; OHS = Overall Health Status; QOL = Quality of Life; HC = Health Changes over Last Year. \* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ .

With respect to conscientiousness, age, sex, education, marital status, living arrangement, number of children, years in the U.S., years in the community, overall health status, quality of life and health changes over the last year were all significantly correlated with the levels of conscientiousness endorsement among participants. Specifically, being younger ( $r = -0.14$ ), being male ( $r = -0.05$ ), having a higher education ( $r = 0.15$ ), being married ( $r = 0.13$ ), living with more people ( $r = 0.07$ ), having fewer children ( $r = -0.06$ ), having lived in the U.S. for fewer years ( $r = -0.11$ ), having lived in the community for fewer years ( $r = -0.09$ ), better overall health status ( $r = 0.20$ ), better quality of life ( $r = 0.17$ ), and better health status over the last year ( $r = 0.07$ ) were more likely to report conscientiousness personality traits.

#### 4. Discussion

In this population-based study of Chinese older adults in the Greater Chicago area, we examined the levels of personality trait endorsement including neuroticism and conscientiousness. We also investigated the correlates between personality traits, key socio-demographic factors and self-reported health variables. Younger age and fewer children were significantly correlated with higher endorsement of both traits. However, female gender, better health status, better quality of life and improved health over the past year were correlated with higher levels of neuroticism. In contrast, male gender, poorer health status, lower quality of life and worsening health over the past year were correlated with higher levels of conscientiousness.

There is evidence of the universality for the Five Factor Personality Model, in which it may represent a useful framework tool among Chinese populations [25,26]. With respect to its psychometric properties, the internal consistency of the version administered in Hong Kong was reported to be comparable to that of the original English. The alpha values for the full neuroticism scale was 0.83 and 0.80 for the conscientiousness scale [27]. In the PINE study, the measure also reported satisfactory to good reliability. Our findings suggest that although these assessments of personality traits were developed in a Western cultural context, they may be appropriate for Chinese older adults.

With respect to specific traits, our findings suggest that the level of conscientiousness endorsement was higher than the level of neuroticism. Each of the statements in the conscientiousness scale had at least 67.8% of participants' endorsement, in comparison to the lowest endorsement rate of 14.3% in the neuroticism measure (Item 2: I often feel inferior to others). This finding is consistent with previous studies among Chinese older adults in PRC that older groups generally possess higher agreement level on conscientiousness traits than neuroticism [25]. Whereas previous studies suggest that conscientiousness trait was negatively associated with neuroticism in the general populations [28], future analysis should be conducted to explore the complex associations between different personality traits among Chinese aging population.

In addition, research on the relation of neuroticism and conscientiousness to socio-demographic characteristics among community-dwelling Chinese older adults has been sparse. In previous population-based studies of older adults, neuroticism was positively correlated with age, and conscientiousness seemed to have non-significant correlation with age [4,24,27]. Our findings, however, suggest that both neuroticism and conscientiousness were negatively correlated with age ( $r = -0.06$  and  $-0.14$ , respectively). One possible explanation for the inconsistency among study findings may be a result of the differences in how the multi-dimensional traits were assessed, and some facets may be more strongly related to aging than others. For instance, although the brief measure of neuroticism administered in the PINE study has been tested in prior population-based study and was closely

related to standard measures of the trait [28], its use may lead us to underestimate their associations with the process of aging among older adults. Much of the associations of these traits with aging warrants further exploration.

Interestingly, conscientiousness was significantly correlated with higher levels of education, whereas the association was unclear between neuroticism and education. This is congruent with previous studies that conscientiousness has been considered as a consistent predictor of academic performance. One possible explanation may be that highly conscientious people are predisposed to a more intensive exposure and eager to thrive to these educational experiences than less conscientious individuals [29].

In addition, our findings suggest that higher levels of neuroticism trait were correlated with self-reported worsened health status, including overall health, quality of life, and worsened health over the last year; whereas higher levels of conscientiousness traits were positively correlated with self-reported health status. One possible reason was the close association between conscientiousness and the a higher level of resilience [30,31], whereas most literature pinpointed the level of neuroticism as strongly associated with psychological distress, including suicidal ideation and behavior [7–9]. Prior reports suggest that U.S. Chinese older adults have the highest suicide rate than any other racial/ethnic groups nationwide [32]. In our sample of Chinese older adults in the Greater Chicago area, the lifetime and the past 12-month prevalence of suicidal ideation were alarmingly high [19]. Improved understanding on adverse health outcomes and specific personality traits among minority older adults are needed to inform culturally and linguistically sensitive prevention and intervention strategies. Additional studies are needed to elucidate these relationships in other racial/ethnic groups

The findings of this study should be interpreted with limitations. First, participants in this study are all from the U.S. The findings are not generalizable to Chinese populations in other regions of U.S. or other countries such as mainland China or Hong Kong as they may be subjected to different social and economic influence. In addition, given neuroticism and conscientiousness are reported to have close associations with mortality and morbidity in old age, this study only examined neuroticism and conscientiousness traits among the Five Factor Model. Future studies should be conducted to explore the associations among other factors. In addition, more in-depth investigation is needed to examine the age and gender variation regarding different levels of personality traits endorsement. A third limitation arises from the cross-sectional study design and we could not address the issues of temporal relationship in the present study. Future longitudinal studies are needed to understand the risk factors and protective factors of personality traits with health over time. Furthermore, quantitative data is limited in providing information under special cultural context. We call for future mixed method studies to understand culturally specific orientations.

This study has potential practical implications. Healthcare professional should be aware the dimensions of personality trait among Chinese older adults because they are relevant to many phases of the process of counseling [33]. It will be critical to further assess the health and personality traits of these older adults as potential contributing factors to health outcomes. Social services agency should be aware of the health, quality-of life issues and personality traits in minority older adults. Even though older adults may have pronounced specific personality traits, future research effort are needed to explore the association between other personality traits, morbidity and mortality. Future studies are also needed to examine the psychological and psychiatric consequences of specific personality trait.

## 5. Conclusion

As the largest population-based study on personality traits of U.S. Chinese older adults in the greater Chicago area, our findings showed that compared to the level of neuroticism, conscientiousness was highly endorsed among this study sample. Age, sex, marital status, number of children overall health status, quality of life and health changes over the last year were correlates of both personality traits. Our study calls for future research in understanding health and personality traits in U.S. Chinese aging population. Further studies are needed to elucidate health and well-being associated with specific personality trait among minority older adults

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## Conflict of Interest

The authors report no conflict of interest associated with this review.

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