


# Loneliness, Depressive Symptoms, and Cognitive Functioning Among U.S. Chinese Older Adults

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## Abstract

**Objective:** Loneliness has been associated with cognitive functioning in the general older adult population. Previous studies further indicate that loneliness has a strong association with depressive symptoms and the two constructs can reinforce each other to diminish well-being. However, such relationships have not been examined in U.S. Chinese older adults. This study attempts to bridge this knowledge gap. **Method:** Data were drawn from a population-based study of 3,159 U.S. Chinese older adults in the Greater Chicago area. Stepwise multivariate regression analyses were conducted to examine the relationship between loneliness, depressive symptoms, and global cognitive functioning. **Results:** Loneliness was associated with poor global cognitive functioning in U.S. Chinese older adults, though the relationship became nonsignificant after adjustment for depressive symptoms. The interaction term between loneliness and cognitive functioning was statistically significant ( $p < .01$ ). The findings further highlight the importance of age, education, number of children, number of people in household, and length of residence in the U.S. in cognitive functioning among U.S. Chinese older adults. **Discussion:** The study findings indicate that loneliness and depressive symptoms act together to influence cognitive functioning in U.S. Chinese older adults. Research and clinical implications of the findings are discussed.

## Keywords

loneliness, depressive symptoms, cognitive functioning, cognition, Chinese older adults, minority aging

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## Introduction

Cognitive impairment leads to diminishing quality of life among older adults, significant caregiver burden, and substantial societal costs (Alzheimer's Association, 2016). It is estimated that the age-specific prevalence of cognitive impairment among Asian Americans is comparable with that of the general U.S. older adult population (J. C. Chen, Borson, & Scanlan, 2000; Manly & Mayeux, 2004). Older Chinese adults represent one of the largest and fastest growing older Asian American subgroups (Hoeffel, Rastogi, Kim, & Hasan, 2012). As the number of older Chinese adults in the United States grows rapidly, cognitive impairment is expected to become an increasing public health concern in this population. Therefore, identifying the factors associated with cognitive functioning in this population is imperative.

“Loneliness has been defined as an individual’s subjective experience about a lack of satisfying human relationships” (Tilvis et al., 2012). Loneliness can arise when an individual does not have social partners to engage with or to provide a sense of emotional intimacy or when

individuals feel misunderstood, estranged from, or rejected by others (Donaldson & Watson, 1996; Hazer & Boylu, 2010). Research shows that higher levels of loneliness are associated with poor health and functional status, the existence of certain medical conditions, widowhood, living alone, depression, being poorly understood by close persons, and unfulfilled expectations of friends or children (Schnittger, Wherton, Prendergast, & Lawlor, 2012; Yang & Victor, 2008).

The negative relationship between loneliness and cognitive functioning has been well-established in the general older adult population (Boss, Kang, & Branson, 2015; Cacioppo & Hawkley, 2009;

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McDermott & Ebmeier, 2009). Although the underlying mechanisms remain inconclusive, existing studies offer three potential explanations for the relationship between loneliness and cognitive functioning. Loneliness could induce negative lifestyle behaviors, such as physical inactivity, lack of cognitive exercises, smoking, drinking, and sleep disturbances, all of which have been reported to be risk factors of cognitive decline (Baumgart et al., 2015; Berkman, Glass, Brissette, & Seeman, 2000; Golden et al., 2009; Steptoe, Owen, Kunz-Ebrecht, & Brydon, 2004). There are also potential biological pathways through which loneliness influences cognitive functioning (Berkman et al., 2000; Boss et al., 2015). For instance, loneliness has been reported to elevate cortisol levels, the prolonged state of which impairs certain neurons in the brain that store memory (Epel, 2009; Steptoe et al., 2004). Furthermore, loneliness can deprive the affected individuals of psychological benefits of social relationships, such as self-efficacy, emotional support, and purpose and meaning in life, thereby increasing their risk of cognitive impairment (Berkman et al., 2000; Fratiglioni, Paillard-Borg, & Winblad, 2004).

Depressive symptoms have been widely reported as another psychosocial factor associated with cognitive functioning (Fratiglioni et al., 2004; McDermott & Ebmeier, 2009). Previous studies further suggest that older adults who suffer from depressive symptoms are highly likely to feel lonely and vice versa, and that there exist reciprocal influences between the two constructs over time to diminish well-being (Barg et al., 2006; Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006; Golden et al., 2009). Taken together, these studies indicate that loneliness and depressive symptoms could reinforce each other and have synergistic and deleterious effects on cognitive functioning.

Feelings of loneliness and depressive symptoms are prevalent in U.S. Chinese older adults (Simon, Chang, Zhang, Ruan, & Dong, 2014). A previous study reported that more than one quarter of U.S. Chinese older adults (26.2%) reported feelings of loneliness, a rate higher than that of the general older adult population (19.3%; Theeke, 2009). According to various studies, approximately 20% to 30% of Chinese older adults in the United States experience depressive symptoms (Mui & Kang, 2006). However, the relationship between loneliness and cognitive functioning has not been examined among U.S. Chinese older adults. A careful review of the literature with respect to whether loneliness is associated with cognitive functioning among Chinese older adults yields only one qualitative study that explored the impact of loneliness on health and well-being among U.S. Chinese older adults (Dong, Chang, Wong, & Simon, 2012). It is also unknown whether depressive symptoms play a role in this relationship among Chinese older adults. This study attempts to bridge this knowledge gap by (a) investigating the relationship between loneliness and cognitive functioning and (b) examining whether

depressive symptoms moderate the relationship between loneliness and cognitive functioning.

By examining the relationship between loneliness, depressive symptoms, and cognitive functioning, this study aims to enhance our understanding of the underlying mechanisms that influence cognitive functioning, which could inform the development of longitudinal research and culturally appropriate intervention strategies for this rapidly growing population.

## Method

### *Population and Settings*

This study used data from the Population Study of Chinese Elderly in Chicago (PINE) collected between July 2011 and June 2013. The purpose of the PINE study was to examine the psychological and social well-being of U.S. Chinese older adults (Dong et al., 2014). Eligible participants were (a) self-identified as Chinese, (b) at least 60 years old, and (c) a resident in the Greater Chicago area. The research team worked with more than 20 local community partners to conduct a targeted recruitment strategy that has been described in greater detail elsewhere (Dong, Wong, & Simon, 2014). Of the 3,542 eligible participants who were approached, a final sample of 3,159 Chinese older adults gave consent and completed the study, yielding a response rate of 91.9% (Dong et al., 2014). Data were collected by trained bilingual and bicultural research assistants through face-to-face home interviews with participants in their preferred language and dialects (R. Chen, Simon, Chang, Zhen, & Dong, 2014). Each research participant received a US\$15 gift card at the completion of the interview. The PINE study participants were found to be representative of older Chinese adults in the Greater Chicago area (Simon, Chang, Rajan, Welch, & Dong, 2014). The PINE study was approved by the institutional review board of the Rush University Medical Center.

## Measures

### *Dependent Variables*

The dependent variable of this study was cognitive functioning, assessed by a combination of five individual cognition tests, including the Chinese Mini-Mental State Exam (C-MMSE), East Boston Memory Test (EBMT)-Immediate Recall, EBMT-Delayed Recall, Digit Span Backwards (DSB) test, and Symbol Digit Modalities Test (SDMT).

The C-MMSE has been widely used in epidemiological studies and reported to have sound psychometric properties in Chinese samples (Chiu et al., 1998; Xu et al., 2003). Total scores on this test range from 0 to 30. Scores of the immediate and delayed recalls of EBMT were summarized to measure episodic memory. The EBMT consists of a story with three short sentences, each of which contains two scorable ideas (Gfeller & Horn, 1996). The

interviewer read the story to the participants and asked them to retell the story immediately. Those participants who recalled four or less ideas on immediate recall were asked to retell the story again after a distracting task about 3 min later (Evans et al., 1989; Scherr et al., 1988). Total scores on this test range from 0 to 24. The oral version of the 11-item SDMT was used to measure perceptual speed. The participants were presented a reference key of nine numbers with nine corresponding symbols. They were then given an array of symbols and asked to identify the corresponding numbers for the symbols as quickly as possible in 90 s (Drake et al., 2010). Total scores on this test range from 0 to 80. The DSB test, a subtest from the Wechsler Memory Scale-Revised, was used to assess working memory (Wilson et al., 2002). The participants were read two- to seven-digit sequences at increasing length, with two items added at a time, and asked to repeat them in the reverse order of its presentation (Wilde, Strauss, & Tulskey, 2004; Wilson et al., 2002). The procedure stopped when participants failed both items at a given addition. Total scores on this test range from 0 to 12. To reduce measurement error and floor and ceiling effects in the individual tests, we constructed a composite measure of global cognition by converting scores of each individual test to a *z* score and averaging the *z* scores across the tests (Aggarwal, Wilson, Beck, Bienias, & Bennett, 2005; Wilson et al., 2002).

The original English versions of the measures were translated into Chinese by a bilingual research team, when necessary. The Chinese versions of the measures were back-translated by bilingual and bicultural investigators to ensure consistency and accuracy of the translation. The Chinese versions of the measures were then reviewed by a team consisting of an experienced bilingual and bicultural geriatrician along with various community stakeholders to further ascertain validity, and cultural sensitivity and appropriateness of the measures (Chang, Beck, Simon, & Dong, 2014).

### Independent Variables

Loneliness was assessed by a validated three-item loneliness scale adapted from the 20-item Revised University of California at Los Angeles Loneliness Scale (Hughes, Waite, Hawkley, & Cacioppo, 2004). The participants were asked whether they lack companionship, feel left out, and feel isolated from others. Study participants rated the extent to which they endorsed each item on a Likert scale with 1 = *hardly ever*, 2 = *some of the time*, and 3 = *often*. The final score is a sum of the scores for the three items. A higher score indicated a greater level of loneliness. The scale was reported to be a reliable (Cronbach's  $\alpha = .72$ ) and valid measure of loneliness in the general older adult population (Hughes et al., 2004). It demonstrated acceptable psychometric properties in the study sample with a Cronbach's alpha of .78 (Chang et al., 2014).

Depressive symptoms were measured by the nine-item Patient Health Questionnaire (PHQ-9). The nine

items consisted of loss of interest or pleasure in doing things, feeling down, sleep problems, feeling tired or having little energy, change in appetite, feeling bad about self, inability to concentrate, feeling restless, and suicidal thoughts (Kroenke & Spitzer, 2002). Study participants rated the extent to which they experienced each item using a Likert scale ranging from 0 = *not at all* to 3 = *nearly every day*. The final score is a sum of the scores for the nine items, ranging from 0 to 27. A higher score indicates a greater level of depressive symptoms. The Cronbach's alpha of the scale for the study sample was .82 (Chang et al., 2014).

### Covariates

Covariates included age (in years), gender (male/female), education (in years, ranging from 0 to 17 years or more), income (in US\$), marital status (married/not married), number of children, number of people in household, language preference (English/Mandarin vs. Cantonese/Toishanese), years in the United States (in years), and number of chronic conditions. For language preference, English and Mandarin were collapsed as one category to allow for inferential comparisons because there were a limited number of English speakers in the PINE study. Annual income from all sources reported by the participants, was coded as a continuous variable with 10 categories, ranging from 1 = US\$0 to US\$4,999 to 10 = US\$75,000 and above. Number of people in household was measured by asking participants the number of people in their households besides themselves. Number of chronic conditions was constructed by summing the incidence of nine chronic medical diagnoses, including heart disease, stroke, cancer, high cholesterol, diabetes, high blood pressure, hip fracture, thyroid, and osteoarthritis.

### Data Analysis

Descriptive statistics were used to summarize the sample characteristics. Chi-square tests and *t* tests were used to compare sociodemographic and health-related differences between participants who reported any loneliness and those who reported no loneliness. Second, Spearman correlation coefficients were calculated to describe the relationships among study variables. Multivariate regression analyses were conducted to examine the association between loneliness and global cognitive functioning, controlling for the covariates. Diagnostic statistics suggested that the regression assumptions were met (Christensen, 1997). A series of regression models were conducted using the stepwise technique: Model 1 contained sociodemographic factors, Model 2 contained the variables in Model 1 and social support variables, Model 3 contained the variables in Model 2 and immigration-related variables, Model 4 contained the variables in Model 3 and number of chronic conditions, Model 5 contained the variables in Model 4 and depressive symptoms. To help explicate the potential mechanisms, we examined associations between loneliness and cognitive functioning

**Table 1.** Sample Characteristics.

	Total	Any loneliness <i>n</i> = 819	No loneliness <i>n</i> = 2,306	<i>p</i>
Global cognitive functioning, <i>Mean (SD)</i>	-0.04 (1.02)	-0.10 (0.91)	-0.01 (0.82)	.012
Age, <i>Mean (SD)</i>	72.82 (8.31)	73.92 (8.60)	72.36 (8.13)	<.0001
Male, <i>n (%)</i>	1,327 (42.01)	305 (9.76)	1,005 (32.16)	.002
Education, <i>Mean (SD)</i>	8.72 (5.05)	8.94 (5.35)	8.67 (4.93)	.197
Income, <i>Mean (SD)</i>	1.95 (1.14)	1.91 (1.07)	1.96 (1.15)	.754
Married, <i>n (%)</i>	2,234 (70.72)	446 (14.29)	1,767 (56.63)	<.0001
Number of children, <i>Mean (SD)</i>	2.87 (1.51)	2.84 (1.60)	2.88 (1.47)	.252
Number of people in household, <i>Mean (SD)</i>	1.87 (1.89)	1.58 (1.77)	1.99 (1.93)	<.0001
Mandarin/English, <i>n (%)</i>	742 (23.49)	246 (7.87)	491 (15.71)	<.0001
Years in the United States, <i>Mean (SD)</i>	20.02 (13.18)	21.34 (14.40)	19.52 (12.66)	.001
Number of medical conditions, <i>Mean (SD)</i>	2.06 (1.46)	2.26 (1.54)	1.99 (1.42)	<.0001
Depressive symptoms, <i>Mean (SD)</i>	2.65 (4.13)	5.31 (5.49)	1.65 (2.86)	<.0001

Note. Participants were classified as lonely if they responded "some of the time" or "often" to any of the three items in the loneliness measure. Those who responded "hardly ever" to all three items were classified as not lonely.

before and after controlling for depressive symptoms. The interaction term between loneliness and depressive symptoms was entered in a separate regression model, with the same covariates, to investigate the moderation hypothesis (Baron & Kenny, 1986).

Missing data were addressed by listwise deletion in all models. Only subjects with complete data were used for data analyses in the present study ( $N = 3,051$ ). Because the rate of missing data (3.4%) is below the cut-off of 5%, which makes missing data a problematic issue, the analytic sample after listwise deletion possesses adequate statistical power to detect the relationship of interest (Schafer, 1999). A variance inflation factor of greater than 10 was used to detect multicollinearity between the independent variables in the multivariate regression models (Montgomery, Peck, & Vining, 2012). All statistical analyses were conducted using SAS Version 9.2 (SAS Institute Inc., Cary, North Carolina).

## Results

### Sample Characteristics

Of the 3,159 participants, 58% were female, 85% had an annual income of less than US\$10,000, 71% were married, 23.5% preferred to speak Mandarin or English, 20% experienced depressive symptoms, and 26.2% reported any loneliness symptoms. (Table 1) On average, the participants were 73 years old, had 8.7 years of education, had three children, lived in the United States for 20 years, lived with two other persons in the household, and had two chronic conditions. Overall, the participants who reported any symptoms of loneliness were older, female, not married, lived with fewer people in the household, Cantonese or Toishanese speakers, lived in the United States for more years, had more chronic conditions, and greater levels of depressive symptoms. In addition, the participants who were lonely had poorer

performance in global cognitive functioning. Bivariate correlation coefficients among the study variables are presented in Table 2.

### Association Between Loneliness, Depressive Symptoms, and Global Cognition

Severity of loneliness was negatively related to performance in global cognitive functioning ( $\beta = -0.03$ ,  $p < .001$ ), controlling for the related sociodemographic and health covariates (Table 3, Model 4). When depressive symptoms were added to the model, the association between loneliness and cognitive functioning became nonsignificant (Table 3, Model 5). The interaction term between loneliness and cognitive functioning was statistically significant ( $p < .01$ ; Table 3, Model 6). We also found similar results for each individual cognitive domain as the global cognitive measure (results not shown). Multicollinearity was not present among the independent variables in regression models (variance inflation factor ranged 1.2-1.7).

## Discussion

To our knowledge, this is the first study examining the relationship between loneliness, depressive symptoms, and cognitive functioning in U.S. Chinese older adults. The key finding of this study is that loneliness was associated with poor global cognitive functioning in U.S. Chinese older adults, though the relationship became nonsignificant after adjustment for depressive symptoms. The significant moderating effect of depressive symptoms implies that depressive symptoms play a role in the relationship between loneliness and cognitive functioning. We suspect that loneliness and depressive symptoms act together to influence cognitive functioning in U.S. Chinese older adults. This finding is concordant with a prospective population-based

**Table 2.** Correlation Coefficients Among Independent Variables.

	Age	Sex	Edu	Income	MS	NoC	NoP	LP	YiU	Chronic	DS	Lonely
Age	1											
Sex	-.01	1										
Edu	-.11***	-.20***	1									
Income	.05**	.05**	.01	1								
MS	-.32***	-.34***	.22***	-.10***	1							
NoC	.32***	.08***	-.39***	-.004	-.13***	1						
NoP	-.35***	-.12***	.02	-.15***	.39***	-.07***	1					
LP	-.03	-.01	-.55***	.09***	-.07***	.29***	.03	1				
YiU	.35***	.05**	-.10***	.35***	-.22***	.15***	-.31***	.23***	1			
Chronic	.24***	.13***	.02	.04*	-.13***	.05**	-.14***	-.06***	.18***	1		
DS	.10***	.12***	-.03	-.04*	-.09***	.001	-.04*	-.08***	.004	.19***	1	
Lonely	.08***	.05**	.02	-.01	-.22***	-.02	-.12***	-.09***	.05**	.07***	.39***	1

Note. Edu = education; MS = marital status; NoC = number of children; NoP = number of people in household; LP = language preference; YiU = years in the United States; Chronic = number of chronic conditions; DS = depressive symptoms; Lonely = loneliness.

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

study reporting coexisting depression and loneliness was associated with a twofold increase in all-cause mortality risks among older adults aged 85 years and above (Stek et al., 2005). These results indicate that U.S. Chinese older adults who experience both loneliness and depressive symptoms could be especially vulnerable to poor cognitive functioning and deserve special attention.

It is also possible that depressive symptoms may mediate the relationship between loneliness and cognitive functioning. However, existing evidence on the temporal association between loneliness and depressive symptoms has been mixed. Several longitudinal studies reported that loneliness predicts depressive symptoms (Cacioppo, Hawkley, & Thisted, 2010; Vanhalst, Luyckx, Teppers, & Goossens, 2012), whereas others concluded the opposite (Lasgaard, Goossens, & Elklit, 2011). Moreover, the cross-sectional nature of our data precludes our ability to make causal interpretations as to this temporal order. Therefore, the testing of the alternative mediating hypothesis in our study using statistical methods seems arbitrary. Taken together, our understanding of the temporal relations between loneliness, depressive symptoms, and cognitive functioning remains limited. The study findings call for longitudinal studies to disentangle the causal relationships and underlying mechanisms linking loneliness, depressive symptoms, and cognitive functioning. Particularly, the potential reciprocal relationship between loneliness and depressive symptoms and its effect on cognitive functioning, or well-being in general, deserves longitudinal investigation.

The study findings further highlight the importance of several other factors in cognitive functioning in this population, including age, education, number of children, length of residence in the U.S., and number of people in the household. Consistent with prior research, older age was associated with poorer performance in all cognitive domains, and higher educational levels were associated

with better performance in all cognitive domains (Alzheimer's Association, 2016; Ding et al., 2015; Hendrie et al., 2006; Nie et al., 2011). In addition, findings of this study indicate that U.S. Chinese older adults with more children had poorer cognitive functioning. A possible explanation is while adult children are the vital and desirable source of social support for Chinese older adults, intergenerational relationships may present tensions and social strain at the same time, leading to worsening health conditions, depression, and cognitive impairment (Chen et al., 2014; Dong, Li, & Hua, 2017; Liu, Dong, Nguyen, & Lai, 2017; Rook, 1984). Another plausible explanation is Chinese older adults with more children may have lower educational attainment, which has been reported to be a risk factor of cognitive impairment (Baumgart et al., 2015).

Moreover, the inverse relationship between number of people in the household and cognitive functioning in all domains, except episodic memory, is consistent with prior research that reported living with spouse and adult children has negative influences on older Chinese immigrants' well-being (Wong, Yoo, & Stewart, 2007). However, the cross-sectional nature of this study precludes our ability to determine the temporal order of this relationship. It is also possible that older adults with poorer cognitive function are more likely to live with more people because they have greater care needs. Finally, the study findings suggest that length of residence in the U.S. was positively associated with all cognitive function domains except working memory. One plausible explanation is longer years lived in the United States may increase Chinese older adults' engagement in social and leisure activities, which can mitigate cognitive decline (Niti, Yap, Kua, Tan, & Ng, 2008).

## Limitations

The findings of this study are subject to several limitations. First, as the study participants were recruited

**Table 3.** Association Between Loneliness and Global Cognition.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	Estimated slope (SE)					
Age	-0.031 (0.001)***	-0.030 (0.002)***	-0.032 (0.002)***	-0.032 (0.002)***	-0.031 (0.002)***	-0.031 (0.002)***
Female	-0.065 (0.024)**	-0.062 (0.025)*	-0.081 (0.025)**	-0.076 (0.026)**	-0.061 (0.026)*	-0.061 (0.026)*
Education	0.088 (0.002)***	0.084 (0.003)***	0.074 (0.003)***	0.075 (0.003)***	0.073 (0.003)***	0.074 (0.003)***
Income	0.035 (0.010)***	0.031 (0.010)**	0.025 (0.011)*	0.024 (0.011)*	0.021 (0.011)	0.021 (0.011)
Marital status (Married)		0.035 (0.030)	0.033 (0.030)	0.033 (0.030)	0.045 (0.030)	0.043 (0.030)
Number of children		-0.037 (0.009)***	-0.032 (0.009)***	-0.032 (0.009)***	-0.033 (0.009)***	-0.032 (0.009)***
Number of people in household		-0.023 (0.007)***	-0.021 (0.007)**	-0.021 (0.007)**	-0.020 (0.007)*	-0.020 (0.007)**
Cantonese/ Toishanese			-0.200 (0.035)***	-0.201 (0.035)***	-0.210 (0.034)***	-0.211 (0.034)***
Years in the United States			0.003 (0.001)*	0.003 (0.001)*	0.003 (0.001)*	0.002 (0.001)*
Number of medical conditions				-0.011 (0.008)	-0.004 (0.008)	-0.003 (0.008)
Depressive symptoms					-0.023 (0.003)***	-0.024 (0.003)***
Loneliness × Depressive symptoms						0.004 (0.002)**
Loneliness	-0.026 (0.010)**	-0.028 (0.001)**	-0.034 (0.010)***	-0.034 (0.010)***	0.004 (0.011)	-0.009 (0.012)

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

from the Greater Chicago area, it is not clear whether the findings could be generalizable to older Chinese adults residing in other geographic areas or other older adult populations. Second, the findings are limited to U.S. Chinese older adults living in the community who voluntarily participated in the study. The association between loneliness and cognitive functioning among those who are institutionalized or more isolated in the community is disregarded in this study. Third, loneliness may be underreported due to social desirability bias during the in-person interviews (Simon, Chang, Zhang, et al., 2014). Last, the cross-sectional nature of the PINE data limits our ability to make inferences regarding causal relationships.

### Future Directions

Longitudinal studies should be conducted to investigate predictors of cognitive decline and trajectories of cognitive functioning among U.S. Chinese older adults over time. Future studies need to examine other potential mechanisms, such as mediating effects, between psychological variables and cognitive functioning. Moreover, to develop culturally appropriate interventions, additional qualitative research will be necessary to better understand the specific conditions that result in loneliness and depressive symptoms in this population.

### Implications

Culturally and linguistically appropriate psychosocial interventions to ameliorate loneliness and depressive symptoms in U.S. Chinese older adults may have positive effects on their cognitive functioning. For instance, group-based programs with peer Chinese older adults aiming to improve socialization and self-efficacy may be effective in alleviating both loneliness and depressive symptoms (Pitkala, Routasalo, Kautiainen, Sintonen, & Tilvis, 2011). Cultural programming should be consciously included in the intervention to facilitate the participation of Chinese older adults (Pitkala et al., 2011).

### Conclusion

Loneliness was related to poor global cognitive functioning in U.S. Chinese older adults, though the relationship became nonsignificant after adjustment for depressive symptoms. The study findings further suggest that there was a statistically significant interaction between loneliness and depressive symptoms. The findings indicate that the complex relationships among psychosocial variables need to be taken into account when examining their associations with cognitive functioning, or well-being in general.

### Author Contributions

All authors contributed to this article.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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