

# Direct and Indirect Effects of Family Functioning on Loneliness of Elderly Chinese Individuals

Guangya Zhou<sup>1,2</sup> · Yanhua Wang<sup>1</sup> · Xiaobo Yu<sup>1</sup>

Published online: 5 October 2016

© Springer Science+Business Media New York 2016

**Abstract** Loneliness has particularly significant effect on the quality of life of elderly individuals. In this study, we examined the direct and indirect effects of social support on loneliness in elderly respondents. A total of 388 people, aged 60–65 years with a mean of 62.44 ( $SD = 1.82$ ), completed questionnaires measuring family functioning, social support, and loneliness. Structural equation modeling results showed that social support partially mediated the relationship between family functioning and loneliness, and bootstrap estimation procedure and subsequent analyses indicated that the indirect effect of social support on the relationship between family functioning and loneliness of elderly individuals is significant. In short, we found that family-functioning and social support play significant roles in helping older Chinese individuals overcome their high risk of loneliness.

**Keywords** Family functioning · Loneliness · Social support · Elderly

## Introduction

As the world's ageing population continues to grow, China, specifically, is rapidly becoming an aged society (D. Wang 2006; Yu et al. 2012). Health psychology has begun, as such, to focus increasingly on the quality of life of elderly individuals (Tian 2014; X. Wang 2014). Research has indicated that older adults are particularly vulnerable to loneliness and other

negative states of mental health due to declining physical health, loss of friends and loved ones, and life changes and transitions (e.g. retirement) in general later in life (Collins et al. 2011; Fokkema et al. 2012; Steptoe et al. 2013). Loneliness is, in effect, a crucial indicator of the mental health and life quality of the elderly, whose sense of loneliness may have a more far-reaching influence on quality of life and increase the risk for developing mental illness (Holmén and Furukawa 2002; Tian 2014).

Loneliness is a negative subjective emotional experience produced when the individual's interpersonal relationships fail to meet their social needs in quantity and/or quality (Asher and Weeks 2014; Holwerda et al. 2014). Several studies have addressed the harmful consequences of loneliness, including impaired quality of life, subjective health decline, risk of cognitive decline, disability, poor sleep, and nursing home admission (Aylaz et al. 2012; Coyle and Dugan 2012; Shankar et al. 2011). More importantly, loneliness has been associated with increases in mortality and suicidal ideation (Coyle and Dugan 2012). Researchers have also shown that recent social and economic development in China is associated with an increasing trend of loneliness in the elderly in a traditional culture that emphasizes family relationships and social cohesion (Lou and Ng 2012). In the traditional, family-centric Chinese culture, all family members were encouraged to interact often and function consistently as a cohesive unit. As society has developed alongside cultural changes in filial responsibility and expectations of the younger generation, it is more common for older Chinese people to be “empty-nesters”, and as such, to feel more lonely (Dong et al. 2007). Older Chinese adults are said to suffer more the devastating impact of loneliness than younger adults, and their resilience (and factors related to resilience) toward loneliness has not been systematically researched (Dong et al. 2007). The purpose of this study was to examine the ways that elderly individuals defend themselves against

✉ Xiaobo Yu  
pspsychology@163.com

<sup>1</sup> School of Education, Anyang Normal University, Anyang, China

<sup>2</sup> School of Education, Henan University, Kaifeng, China

loneliness, and to determine the role of social support as a mediator in the relationship between family functioning and loneliness.

One of the key protective factors for loneliness for the elderly is support from their families. In China, the family is (and has been throughout its history) the basic unit of society, forming the most important living place for elderly members (J. Wang and Zhao 2012). Family functioning, i.e., the family's ability to work together to achieve common goals, is an important symbol of the operation status of the family system and is also one of the core variables affecting the mental health of family members (Bandura et al. 2011; Popp et al. 2014). According to the Circumplex model of marital and family systems, family functioning includes three dimensions: communication, cohesiveness, and adaptability (Olson et al. 1979; Crea et al. 2014). Family cohesion refers to the emotional connection among family members, while family adaptability refers to the ability of the family to change its power structure, role relationships, and rules in response to development or stressors; family communication is a facilitating factor between cohesion and adaptability.

Studies have shown that loneliness is significantly affected by family functioning (Cao et al. 2013). Family functioning is also an important variable to protect helplessness, desperation, and unworthiness (Engstrom 1999; Herring et al. 2006). In general, family functioning has a stable negative correlation with an individual's loneliness, but previous studies have mostly focused on children and high school students, though other recent studies have shown that family cohesion affects the sense of loneliness in elderly individuals and their mental health and behavior patterns (Andrade et al. 2011). We assert that it is highly important to explore family functioning from a resilience perspective for loneliness in the elderly, in which protective factors can be understood from a reverse-capacity perspective.

Another particularly important issue for the elderly in terms of their defense against loneliness may be social support. According to Biegel et al. (1991), family and other social support systems such as friends and neighbors are important sources of stability and resources for older adults. The convoy model of social support insists that the individual is surrounded by a convoy, a set of people for whom the individual receives reciprocal emotional and social support (Antonucci and Akiyama 1987). The convoy includes special people who constitute the person's social network and impact their subjective emotional experience, which includes loneliness. Research on social support conducted in different contexts and cultures has indicated that there is a strong relationship between social support and loneliness in old age (Luo et al. 2012; Prince et al. 1997; Tilvis et al. 2012), and that elderly people who receive a high level of social support enjoy enhanced health and well-being, less depression, improved life satisfaction, and less loneliness (Perissinotto et al. 2012). Empirical support for a negative relationship between social

support and loneliness has been also found in a wide array of participants including college students and chronic illness patients (Holwerda et al. 2014; Steptoe et al. 2013). Perceived social support may also be negatively correlated to loneliness in the elderly, as such – in other words, social support may be protective factor in addition to family functioning for older adults.

Given that both family functioning and social support are protective factors against loneliness, the current studies aimed to test the concurrent effect of family functioning and social support on loneliness to establish overarching relationships among the three highly related variables in the elderly population. Although the relationship between loneliness and family functioning, or the relationship between social support and loneliness, is supported by a sizable body of research, studies have not yet delved into the manner in which loneliness is affected by family functioning or social support. Findings have revealed a trend toward favorable outcomes for elderly people with high scores on family functioning and social support in terms of their defense against loneliness, but no study has yet specifically investigated social support as a mediating variable of family functioning and loneliness.

This study was conducted in effort to establish better understanding of the relationships among family functioning, social support, and loneliness in older adults, especially, explored the important role of social support to protect Chinese older adults from loneliness as the family structure and filial responsibility is changing in China. Based on careful literature review, we propose a mediation model under which perceived social support (without family support) mediates the effect of family functioning on loneliness in the elderly. Firstly, compared to those with a high level of family functioning, elderly individuals with unhealthy family functioning have a low level of perceived social support. Secondly, because perceived social support is the core variable of predicting individual loneliness, the higher the level of social support the higher the quantity and quality of interpersonal relationships and the less likely the individual is to feel lonely (Schirmer and Michailakis 2015; X. Wang 2014). In short, this study hypothesize that perceived social support (without family support) mediates the influence of the elderly individual's family functioning on loneliness. The findings presented in the current study may help develop prevention and treatment programs promoting social support as an effective defense against loneliness in the elderly population.

## Methods

### Participants and Procedures

Participants were 388 older adults (171 men, 44.07 %; 217 women, 55.93 %) from three cities, Nanjing (Jiangsu

Province,) Shanghai, and Wuhan (Hubei Province) in China. The ages of participants ranged from 60 to 65 years with a mean of 62.44 (SD = 1.82). Convenience sampling was adopted through telephone interview in the current study. All participants were married, but only one pair took part as a couple. 356 participants (91.75 %) reported that they live with their spouses without children or other relatives at home, 12 participants (3.09 %) reported that they live alone because their spouses live in the other city with their children. The average yearly income reported by participants ranged from ¥50,000–¥6,5000 and their level of education averaged 13.6 years. All elderly respondents completed the questionnaires in the classroom environment in their respective communities. All 388 questionnaires that were distributed and collected were valid. Participants voluntarily completed the questionnaires and received ¥20 as compensation.

## Instruments

### Family Adaptability and Cohesion Scale (FACS)

The FACS is a self-rating scale with 30 items that assess perceived family functioning including family adaptability (15 items) and family cohesion (15 items), using a 5-point response scale from 1 (“not at all true”) to 5 (“always true”) (Rodick et al. 1986). Scores ranged from 30 to 150, where higher scores represented greater perceived family functioning. Family adaptability and family cohesion were analyzed independently as two subscales. The FACS was translated into Chinese, and tested with high reliability and validity (Chao 2001). The Cronbach alpha coefficients for family adaptability and family cohesion subscales were 0.74 and 0.81, respectively.

### Multidimensional Scale of Perceived Social Support (MSPSS)

The MSPSS, developed by Zimet et al. (1988), is a 12-item self-report measure of how one perceives their social support system including individual sources of support (e.g., family, friends, significant other.) Items are rated from 1 (“very strongly disagree”) to 7 (“very strongly agree”). Scores ranged from 12 to 84, where higher scores represent greater perceived social support. Examples of items from this form include, “My friends really try to help me.” Two subscales of MSPSS used in the current study were perceived friends and other support. The MSPSS was also translated into Chinese and showed good reliability and validity (Chou 2000). The Cronbach alpha coefficient for the MSPSS was 0.89.

### Social and Emotional Loneliness Scale (SELS)

The SELS was developed by Wittenberg et al. (Wittenberg and Reis 1986). It consists of 10 items designed to assess social loneliness (SL), i.e., lack of social network, and emotional loneliness (EL), or absence of social interaction. Responses to each item were given on a five-point Likert-type scale ranging from 1 (“never”) to 5 (“very often”). Scores ranged from 10 to 50, where higher scores represent greater sense of loneliness. Items include, “I have a really nice set of friends,” “I have friends and acquaintances with whom I like to spend time,” and “I feel lonely even when I am with other people” (Shaver and Brennan 1991). The SELS was translated into Chinese with high reliability and validity (Kong and You 2013). The Cronbach alpha coefficient for the whole scale was 0.71.

## Statistical Analyses

The mediation effect for social support was tested using the two-step structural equation analysis procedure recommended by Anderson and Gerbing (1988). First, the measurement model was tested to assess the extent to which each of the latent variables was represented by its indicators. If the measurement model was accepted, then structural equation modeling (SEM) with the maximum likelihood estimation in AMOS 17.0 was applied. The goodness of fit of the model was evaluated according to chi-square statistics, root-mean-square error of approximation (RMSEA), standardized root-mean-square residual (SRMR), all best if below 0.08, as well as comparative fit index (CFI), which is best if above 0.95 (Anderson and Gerbing 1988; Hu and Bentler 1999; Peng et al. 2013a).

## Results

### Descriptive Statistics

Table 1 presents the mean, standard deviation, and inter-correlation of all study variables. Results showed that family function, social support, and loneliness were indeed significantly correlated with each other.

### Measurement Model

Evaluating the adequate suitability of the measurement model to the sample data required confirmatory factor analysis. As shown in Fig. 1, three latent constructs (family function, social support, and loneliness) and seven observed variables were included in the measurement model. All measurement model indices proved suitable to the data:  $\chi^2/df = 2.034$ , RMSEA = 0.059, SRMR = 0.064, and

**Table 1** Inter-correlations between the interested variables

	Mean	SD	1	2	3
1 Family functioning	77.16	9.47	1		
2 Social support (without family support)	45.73	6.56	0.41**	1	
3 Loneliness	33.59	5.75	-0.45**	-0.50**	1

\*\* $p < 0.01$ 

CFI = 0.995. All the factor loadings for the indicators on the latent variables were significant ( $p < 0.001$ ), as well, which indicated a high representation of the latent constructs by their indicators. In addition, all the latent constructs were significantly correlated in conceptually expected ways ( $p < 0.001$ ).

### Structural Model

In subsequent analyses, the structural model was tested via maximum likelihood estimation. The direct path coefficient from the predictor (family function) to the criterion (loneliness) in the absence of mediators was significant ( $\beta = -0.45$ ,  $p < 0.001$ ). A partially mediated model with the mediator (social support) was a good fit to the data:  $\chi^2/df = 1.92$ , RMSEA = 0.034, SRMR = 0.041, and CFI = 0.996. For the final model, all structural paths were as shown in Fig. 2.

### Mediating Effect Testing

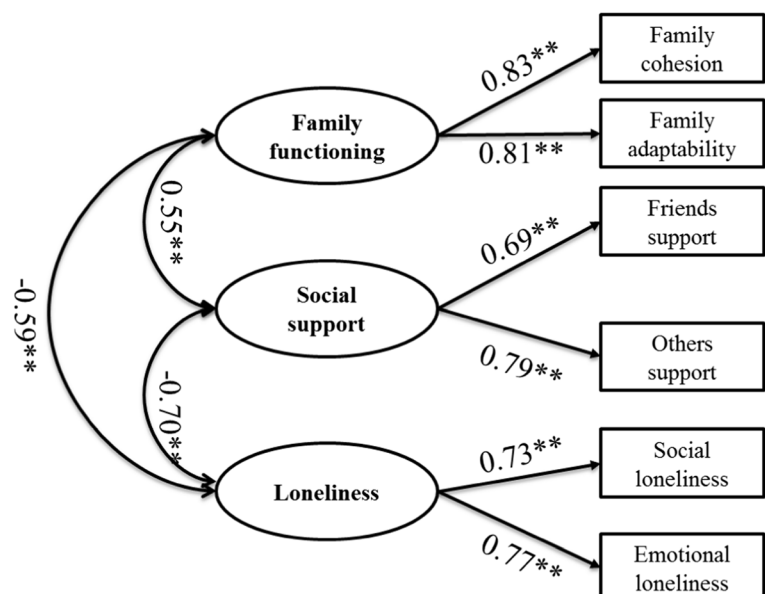
We used the bootstrap estimation procedure in AMOS 17.0 to test the significance of the mediating effect of social support. The basic principle for the bootstrapping approach is that the standard error estimates and confidence intervals (CIs), which are calculated based on the assumption of normal distribution,

are typically imprecise because the indirect effect estimates generally do not actually follow normal distribution (MacKinnon et al. 2004; Peng et al. 2013b). MacKinnon et al. (2004) suggested that the bootstrap method yields the most accurate CIs for indirect effects, and specifically recommended the percentile bootstrap, which provides a CI and both reasonable control of type 1 errors and high statistical power. As mentioned above, a bootstrap sample of 1500 was used to test the mediating effect. The 95 % confidence intervals of the indirect effects are  $[-0.715, -0.443]$ , which did not overlap with zero, further indicating that social support (without family support) mediates the effect of family function and loneliness, see Table 2.

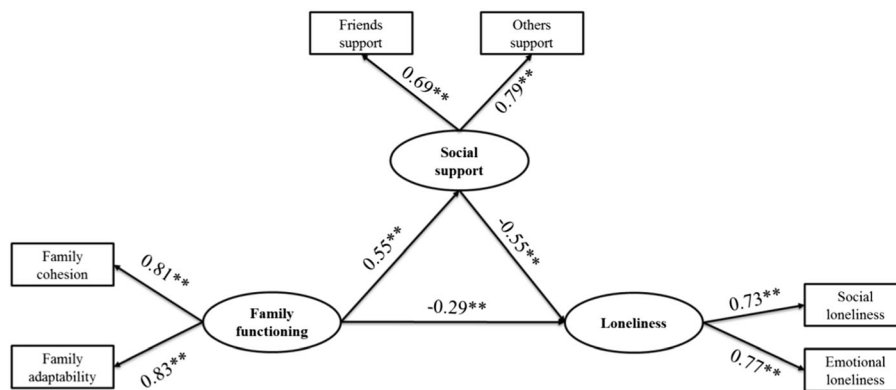
### Discussion

The purpose of this study was to identify a model that includes social support (without family support) as a mediator in the relationship between family functioning and loneliness in the elderly Chinese population. The SEM was used to determine the direct role of family functioning on loneliness, as well as the mediating roles of social support (without family support); results showed a good level of fit. A negative relationship between family functioning and loneliness was found in the

**Fig. 1** The measurement model.  
Note: Factor loadings are standardized; \*\*,  $p < 0.01$



**Fig. 2** The partially-mediated structural model. Note: Factor loadings are standardized; \*\*,  $p < 0.01$



partially mediated model which suggests that older adults with high-functioning families have lower levels of loneliness. This finding consistent with previous research conducted in Western countries (Knutson and Woszidlo 2014; Luo et al. 2012; Wang et al. 2014; Yu et al. 2016). As mentioned above, “family functioning” includes communication, family cohesion and family adaptability (Du et al. 2014). Highly cohesive families give each other more emotional communication, family members experience more intimate connection and thus minimize loneliness in their elderly members. By contrast, elderly individuals feel more lonely when they are from less cohesive families due to lacking emotional communication (Cao et al. 2013). Additionally, because elderly members generally set the same communication pattern in social relationships, elderly individuals who have high family cohesion generally form close relationships outside of the family easily, have higher interpersonal abilities, and experience less social loneliness in general (Holtom-Viesel and Allan 2014). Highly adaptable families deftly manage changes and hardships faced by family members – elderly members of these types of families are better able to deal with loneliness and are able to self-soothe effectively (Sharabi et al. 2012). The findings presented here provide meaningful evidence for the external validity of the relationship between family functioning and loneliness in an Eastern cultural setting. More importantly, this study provides a valuable reference for elderly Chinese individuals and their families regarding the importance of ensuring good family functioning – functional families have less lonely members, even those who live alone.

This study focuses on the validation of the intermediary role of social support (without family support) between family functioning and loneliness, that is to say, the path from family functioning to loneliness through social support (without family support) was significant. Here, the SEM confirmed the hypothesis of this study which provided a new insight of the important role of social support (without family support) in the relationships among family functioning, social support and loneliness. As an old Chinese proverb saying, “rely on family at home; rely on friends when away from home”, social support is the inevitable and very valuable outcome of various relationships (Segrin and Domschke 2011) which plays an important role in protecting elderly people from loneliness. Results of the current study showed that social support (without family support) not only had a negative correlation with loneliness, but also play the mediator role in the relationship between family functioning and loneliness. Individual disharmony in interpersonal relationships, according to psychological disharmony theory, produces loneliness by widening the gap between the individual’s real and expected interpersonal relationships (Hombrados-Mendieta et al. 2013). The more social support an elderly individual receives, the less loneliness they feel and the better they are at coping with loneliness. Conversely, elderly individuals lacking social support may feel isolated, overwhelmed, and of course, lonely (Pehlivan et al. 2012; Wang et al. 2014).

This finding has very important applications in adjustment counseling and interventions in elder adults’ loneliness and

**Table 2** Direct and indirect effects and 95 % confidence intervals for the final model

Model pathways	Estimated effect	95 % CI Lower bonds	95 % CI Up bonds
<b>Direct effect</b>			
Family functioning → Loneliness	-0.29	-0.48	-0.07
Family functioning → Social support (without family support)	0.55	0.41	0.68
Social support (without family support) → Loneliness	-0.55	-0.76	-0.35
<b>Indirect effect</b>			
Family functioning → Social support (without family support) → Loneliness	-0.41	-0.72	-0.44

focus more on multi-level social support, such as support from neighbors, friends and others to ward off loneliness as more of them become “empty-nesters”. Due to the past several years of rapid and widespread economic development in China, more and more young people have to work far away from their home. Older adults now more commonly live alone and become “empty-nesters”, the traditional multi-generation family in which elders continued to live with their children and children’s families has changed (Lou and Ng 2012). Researches indicated that living alone is a potential risk for loneliness (Luo et al. 2012). On the other hand, there is some evidence that the importance of family in China is changing, even though the values of the family are emotionally held very strong in Chinese society, the patterns of assistance to older adults provided by family members have nevertheless changed significantly. Results from this study suggest that older adults may be benefit from social support in mitigating their loneliness as Rook (1984) argued that social support is a social resource which is an important protective factor for loneliness, and thus is more effective than other individual strategies. Strengthening positive family functioning and social support benefits the elderly by lessening their sense of loneliness and improving their overall mental health. To protect older Chinese adults from loneliness, we recommend facilitating greater non-familial outlets for social contact and support that integrate family-oriented and relationship-focused coping strategies at the family and society levels. Before generalizing the finding of the current study, the limitations should be point out. Firstly, it is need to state that the current study used a cross-sectional design, which means it should be cautious when interpret of the mediating role of social support in the relationship between family functioning and loneliness. Thus, future longitudinal or experimental studies need to be conducted to shed light on their relationships and to increase the reliability of this study, so that the protective effect of family functioning for older adults’ loneliness through social support would be more convincing. Secondly, the current study found out that social support partially mediate the effect of family functioning on loneliness in older adults. In other words, it may be else mediating factors exist in the relationship between family functioning and loneliness. Therefore, other mediators, such as dispositional optimism and attributing style, may need to be further studied. Thirdly, this study had the limitation of using self-report investigation which cannot ensure accuracy of the participants’ responses, and the path coefficient among the variables in SEM may have been inflated due to same-method bias, same-source.

**Compliance with Ethical Standards** Guangya Zhou declares that he has no conflict of interest.

Yanhua Wang declares that she has no conflict of interest.

Xiaobo Yu declares that he has no conflict of interest.

## Reference

- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: a review and recommended two-step approach. *Psychological Bulletin*, *103*(3), 411.
- Andrade, F. B. D., Caldas Junior, A. D. F., Kitoko, P. M., & Zandonade, E. (2011). The relationship between nutrient intake, dental status and family cohesion among older Brazilians. *Cadernos de Saúde Pública*, *27*(1), 113–122.
- Antonucci, T. C., & Akiyama, H. (1987). Social networks in adult life and a preliminary examination of the convoy model. *Journal of Gerontology*, *42*(5), 519–527.
- Asher, S. R., & Weeks, M. S. (2014). Loneliness and belongingness in the college years. *The Handbook of Solitude: Psychological Perspectives on Social Isolation, Social Withdrawal, and Being Alone*, 283–301. doi:10.1002/9781118427378.
- Aylaz, R., Aktürk, Ü., Erci, B., Öztürk, H., & Aslan, H. (2012). Relationship between depression and loneliness in elderly and examination of influential factors. *Archives of Gerontology and Geriatrics*, *55*(3), 548–554.
- Bandura, A., Caprara, G. V., Barbaranelli, C., Regalia, C., & Scabini, E. (2011). Impact of family efficacy beliefs on quality of family functioning and satisfaction with family life. *Applied Psychology*, *60*(3), 421–448.
- Biegel, D. E., Magaziner, J., & Baum, M. (1991). Social support networks of white and black elderly people at risk for institutionalization. *Health & Social Work*, *16*(4), 245–257. doi:10.1093/hsw/16.4.245.
- Cao, X., Jiang, X., Li, X., Lo, M.-c. J. H., & Li, R. (2013). Family functioning and its predictors among disaster bereaved individuals in China: eighteen months after the Wenchuan earthquake. *PLoS One*, *8*(4), e60738.
- Chao, R. K. (2001). Extending research on the consequences of parenting style for Chinese Americans and European Americans. *Child Development*, *72*(6), 1832–1843.
- Chou, K.-L. (2000). Assessing Chinese adolescents’ social support: the multidimensional scale of perceived social support. *Personality and Individual Differences*, *28*(2), 299–307.
- Collins, P. Y., Patel, V., Joestl, S. S., March, D., Insel, T. R., Daar, A. S., & Fairburn, C. (2011). Grand challenges in global mental health. *Nature*, *475*(7354), 27–30.
- Coyle, C. E., & Dugan, E. (2012). Social isolation, loneliness and health among older adults. *Journal of Aging and Health*, *24*(8), 1346–1363.
- Crea, T., Chan, K., & Barth, R. (2014). Family environment and attention-deficit/hyperactivity disorder in adopted children: associations with family cohesion and adaptability. *Child: Care, Health and Development*, *40*(6), 853–862.
- Dong, X., Simon, M. A., Gorbien, M., Percak, J., & Golden, R. (2007). Loneliness in older Chinese adults: a risk factor for elder mistreatment. *Journal of the American Geriatrics Society*, *55*(11), 1831–1835.
- Du, N., Ran, M.-S., Liang, S.-g., SiTu, M.-j., Huang, Y., Mansfield, A. K., & Keitner, G. (2014). Comparison of family functioning in families of depressed patients and nonclinical control families in China using the family assessment device and the family adaptability and cohesion evaluation scales II. *Annals of Clinical Psychiatry*, *26*(1), 47–56.
- Engstrom, I. (1999). Inflammatory bowel disease in children and adolescents: mental health and family functioning. *Journal of Pediatric Gastroenterology and Nutrition*, *28*(4), S28–S33.
- Fokkema, T., De Jong Gierveld, J., & Dykstra, P. A. (2012). Cross-national differences in older adult loneliness. *The Journal of Psychology*, *146*(1–2), 201–228.

- Herring, S., Gray, K., Taffe, J., Tonge, B., Sweeney, D., & Einfeld, S. (2006). Behaviour and emotional problems in toddlers with pervasive developmental disorders and developmental delay: associations with parental mental health and family functioning. *Journal of Intellectual Disability Research*, *50*(12), 874–882.
- Holmén, K., & Furukawa, H. (2002). Loneliness, health and social network among elderly people—a follow-up study. *Archives of Gerontology and Geriatrics*, *35*(3), 261–274.
- Holtom-Viesel, A., & Allan, S. (2014). A systematic review of the literature on family functioning across all eating disorder diagnoses in comparison to control families. *Clinical Psychology Review*, *34*(1), 29–43.
- Holwerda, T. J., Deeg, D. J., Beekman, A. T., van Tilburg, T. G., Stek, M. L., Jonker, C., & Schoevers, R. A. (2014). Feelings of loneliness, but not social isolation, predict dementia onset: results from the Amsterdam study of the elderly (AMSTEL). *Journal of Neurology, Neurosurgery & Psychiatry*, *85*(2), 135–142.
- Hombrados-Mendieta, I., García-Martín, M. A., & Gómez-Jacinto, L. (2013). The relationship between social support, loneliness, and subjective well-being in a Spanish sample from a multidimensional perspective. *Social Indicators Research*, *114*(3), 1013–1034.
- Hu, L. t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55.
- Knutson, K., & Woszidlo, A. (2014). The associations between family disengagement, support, loneliness, and stress in young adults attending college. *Family Science*, *5*(1), 20–29.
- Kong, F., & You, X. (2013). Loneliness and self-esteem as mediators between social support and life satisfaction in late adolescence. *Social Indicators Research*, *110*(1), 271–279.
- Lou, V. W., & Ng, J. W. (2012). Chinese older adults' resilience to the loneliness of living alone: a qualitative study. *Aging & Mental Health*, *16*(8), 1039–1046.
- Luo, Y., Hawkey, L. C., Waite, L. J., & Cacioppo, J. T. (2012). Loneliness, health, and mortality in old age: a national longitudinal study. *Social Science & Medicine*, *74*(6), 907–914.
- MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: distribution of the product and resampling methods. *Multivariate Behavioral Research*, *39*(1), 99–128.
- Olson, D. H., Sprenkle, D. H., & Russell, C. S. (1979). Circumplex model of marital and family systems: I. Cohesion and adaptability dimensions, family types, and clinical applications. *Family Process*, *18*(1), 3–28.
- Pehlivan, S., Owayolu, O., Owayolu, N., Sevinc, A., & Camci, C. (2012). Relationship between hopelessness, loneliness, and perceived social support from family in Turkish patients with cancer. *Supportive Care in Cancer*, *20*(4), 733–739.
- Peng, J., He, F., Zhang, Y., Liu, Q., Miao, D., & Xiao, W. (2013a). Differences in simulated doctor and patient medical decision making: a construal level perspective. *PloS One*, *8*(11), e79181.
- Peng, J., Jiang, X., Zhang, J., Xiao, R., Song, Y., Feng, X., & Miao, D. (2013b). The impact of psychological capital on job burnout of Chinese nurses: the mediator role of organizational commitment. *PloS One*, *8*(12), e84193.
- Perissinotto, C. M., Cenzer, I. S., & Covinsky, K. E. (2012). Loneliness in older persons: a predictor of functional decline and death. *Archives of Internal Medicine*, *172*(14), 1078–1084.
- Popp, J. M., Robinson, J. L., Britner, P. A., & Blank, T. O. (2014). Parent adaptation and family functioning in relation to narratives of children with chronic illness. *Journal of Pediatric Nursing*, *29*(1), 58–64.
- Prince, M. J., Harwood, R. H., Blizard, R., Thomas, A., & Mann, A. H. (1997). Social support deficits, loneliness and life events as risk factors for depression in old age. The gospel oak project VI. *Psychological Medicine*, *27*(02), 323–332.
- Rodick, J. D., Henggeler, S. W., & Hanson, C. L. (1986). An evaluation of the family adaptability and cohesion evaluation scales and the circumplex model. *Journal of Abnormal Child Psychology*, *14*(1), 77–87.
- Rook, K. S. (1984). Research on social support, loneliness, and social isolation: toward an integration. *Review of Personality & Social Psychology*, *5*, 239–264.
- Schirmer, W., & Michailakis, D. (2015). The lost Gemeinschaft: how people working with the elderly explain loneliness. *Journal of Aging Studies*, *33*, 1–10.
- Segrin, C., & Domschke, T. (2011). Social support, loneliness, recuperative processes, and their direct and indirect effects on health. *Health Communication*, *26*(3), 221–232.
- Shankar, A., McMunn, A., Banks, J., & Steptoe, A. (2011). Loneliness, social isolation, and behavioral and biological health indicators in older adults. *Health Psychology*, *30*(4), 377–385.
- Sharabi, A., Levi, U., & Margalit, M. (2012). Children's loneliness, sense of coherence, family climate, and hope: developmental risk and protective factors. *The Journal of Psychology*, *146*(1–2), 61–83.
- Shaver, P. R., & Brennan, K. A. (1991). Measures of depression and loneliness. *Measures of Personality and Social Psychological Attitudes*, *1*, 195–290.
- Steptoe, A., Shankar, A., Demakakos, P., & Wardle, J. (2013). Social isolation, loneliness, and all-cause mortality in older men and women. *Proceedings of the National Academy of Sciences*, *110*(15), 5797–5801.
- Tian, Q. (2014). Intergeneration social support affects the subjective well-being of the elderly: mediator roles of self-esteem and loneliness. *Journal of Health Psychology*, *1359105314547245*. doi:10.1177/1359105314547245.
- Tilvis, R., Routasalo, P., Karppinen, H., Strandberg, T., Kautiainen, H., & Pitkala, K. (2012). Social isolation, social activity and loneliness as survival indicators in old age; a nationwide survey with a 7-year follow-up. *European Geriatric Medicine*, *3*(1), 18–22.
- Wang, D. (2006). China's urban and rural old age security system: challenges and options. *China & World Economy*, *14*(1), 102–116.
- Wang, X. (2014). Subjective well-being associated with size of social network and social support of elderly. *Journal of Health Psychology*, *1359105314544136*. doi:10.1177/1359105314544136.
- Wang, J., & Zhao, X. (2012). Family functioning and social support for older patients with depression in an urban area of shanghai, China. *Archives of Gerontology and Geriatrics*, *55*(3), 574–579.
- Wang, X., Cai, L., Qian, J., & Peng, J. (2014). Social support moderates stress effects on depression. *International Journal of Mental Health Systems*, *8*(1), 1–5.
- Wittenberg, M. T., & Reis, H. T. (1986). Loneliness, social skills, and social perception. *Personality and Social Psychology Bulletin*, *12*(1), 121–130. doi:10.1177/0146167286121012.
- Yu, J., Li, J., Cuijpers, P., Wu, S., & Wu, Z. (2012). Prevalence and correlates of depressive symptoms in Chinese older adults: a population-based study. *International Journal of Geriatric Psychiatry*, *27*(3), 305–312.
- Yu, X., Zhou, Z., Fan, G., Yu, Y., & Peng, J. (2016). Collective and individual self-esteem mediate the effect of self-Constructs on subjective well-being of undergraduate students in China. *Applied Research in Quality of Life*, *11*(1), 209–219.
- Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment*, *52*(1), 30–41.