

A Worsening Trend of Life Satisfaction among the Chinese Elderly from 1992 to 2002

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Abstract: Research on elder's life satisfaction is growing across different ethnic groups and nations in recent decades. Yet little is known about changes in life satisfaction among the elders over time in transitional societies, such as China, where the social structural reforms and economic development have dramatically reshaped social values and people's expectations. Using data from the 1992 Old-Age Support Survey of the Chinese Elderly (OSSCE) and the 2002 Chinese Longitudinal Healthy Longevity Survey (CLHLS), this study attempts to examine the changes in life satisfaction of the Chinese elders from 1992 to 2002 after accounting for the changes in individual sociodemographics, social support, healthcare accessibility, and health status. The two datasets include 22,203 respondents aged 65 and over in twelve provinces. We find that there is a worsening trend in life satisfaction among the Chinese elderly, especially among the lonely elders. Underlying causes and policy implications are discussed.

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INTRODUCTION

As the cognitive domain of subjective well-being, life satisfaction refers to a subjective overall assessment of one's life, or comparison reflecting perceived discrepancy between one's expectation and achievement (Bowling and Farquahar 1996; Chen 2001; Mroczek and Spiro 2005; Myers and Diener 1995; Schimmack et al. 2002). Research on elder's life satisfaction has been widely investigated across different ethnic groups and nations in recent decades (e.g., Fagerström et al. 2007; Thomas and Holmes 1992; Zhang and Yu 1998). A consensus has been reached that life satisfaction is affected by various individual characteristics, social support, health conditions, and social change (Thumboo et al. 2003; Tsang, Liamputtong, and Pierson 2004). It has been hypothesized that old adults are more likely to be affected by social change because social change weakens the traditional value gained for many decades (Shank and Keith 1995; Tsang, Liamputtong, and Pierson 2004). According to person-environment theory (Lawton 1983), life satisfaction is determined by intrapersonal and social-normative criteria.

Yet, there is still no agreement among researchers about the direction of those effects (Bowling and Farquahar 1996). For example, some studies report that life satisfaction may *decrease* with age, whereas others suggest that life satisfaction does not necessarily decrease in late life (Hamarat et al. 2002; Zeng, George, Liu 2002). Still others find a curvilinear trajectory of association between age and life satisfaction with the highest life satisfaction found at one's middle-ages (Mroczek and Spiro 2005). As for gender differences in life satisfaction, although old women experience more health-related problem than old men (Murtagh and Hubert 2004), there is evidence showing gender difference in overall life satisfaction was small (Berg et al. 2006; Pinquart and Sorensen 2001), and men's higher likelihood in subjective well-being is accounted by their advantages in SES and health condition (Pinquart and Sorensen 2001). However, correlates of life satisfaction seem to be different in older men and women (Berg et al. 2006). For instance, social support is more importantly related to men's life satisfaction, while subjective well-being and health are more closely related to women's life satisfaction (Berg et al. 2006; Wang et al. 2002). Individual socioeconomic status may play some roles in determining life satisfaction (Waters et al. 1989; Zhang and Liu 2007). For example, the elders with a better financial condition enjoy better healthcare and a higher standard of living and thus they likely tend to have a greater life satisfaction (Gray, Ventis and Hayslip 1992; Zhang and Yu 1998).

Cultural orientation plays some crucial role in determining the life satisfaction (Cheung and Leung 2004; Ji et al. 2002; Schimmack et al. 2002). Social support and social network factors are generally shown to be less powerful in predicting the life satisfaction in developed countries (Revicki and Mitchell 1990). However, the associations might vary across different populations (Bowling and Farquahar 1996). For example, family-tie is a central cultural component of social support in China so that living or proximity with family members likely improves people's life satisfaction (Zhang and Liu 2007; Zhang and Yu 1998). Empirical research confirms such an argument. Silverstein, Cong, and Li (2006) report that multi-generational coresidence improves the psychological well-being, while Zhang and Liu (2007) show that childlessness or live alone worsens life satisfaction.

Numerous studies have documented that functioning in activities of daily living (ADL) and self-reported health are significant predictors of life satisfaction (Berg et al. 2006; Easterlin 2003; Menec 2003; Zhang and Yu 1998), and such associations may be gender-specific (Berg et al. 2006). The relation between chronic diseases and life satisfaction is unclear. Some studies showed a non-significant association (Myers and Diener 1995; Zhang and Yu 1998), while others do (e.g., Berg et al. 2006).

Studies in China further show a disparity in life satisfaction between urban and rural old adults. Urban elders may have a great sense of satisfaction in life and they are more satisfied with their lives due to their greater access to medical service and financial security (e.g., pension) (Zhang and Liu 2007). But their life satisfaction may be decreasing in recent years than their rural counterparts because of their greater concerns about their long-term financial security due to pension reform and long-term care services (Gu and Vlosky 2008).

To date, literature in analyzing correlates with life satisfaction is growing, yet little is known about changes in life satisfaction among the elders over time in transitional societies, such as in China, where the social structural reforms and economic development have dramatically reshaped social values and people's expectations. Given the difference in expectation among different cohorts due to different experience and the influence of periodic events on life satisfaction (Frijters, Haisken-DeNew, and Shields 2004), the evaluation standard of life satisfaction may vary across times or among different cohorts. In this study, we attempted to fill this gap by examining changes in life satisfaction in two cross-sectional survey datasets in China in 1992 and 2002. In addition, we attempt to account for the changes by using individual sociodemographics, social support, healthcare accessibility, and health.

DATA AND METHODS

Data

This study uses data from the 1992 Old-Age Support Survey of the Chinese Elderly (OSSCE) and the 2002 Chinese Longitudinal Healthy Longevity Survey (CLHLS). The OSSCE was conducted in 13 provinces/cities throughout mainland China to gather information on the elderly support system in China and its policy implications by the China National Research Center on Aging (CNRCA). The OSSCE survey consists of a multistage random sample of individuals selected according to stratum classified first by the economic conditions, urbanization, and population aging of each province, and secondly, by the population of the city and the economic development of the county. The survey units are based on villages in rural areas ($n = 47$) and street blocks in urban areas ($n = 49$) in the 13 provinces. The total sample includes 20,083 individuals, with 9,588 men and 10,495 women aged 60 and over. Details of the OSSCE sampling design and interview techniques are documented elsewhere and show that the data are of high quality (CNRCA 1994).

The second data source comes from the CLHLS, which focuses on the determinants of healthy longevity among older adults in China. The CLHLS was conducted in half of the randomly selected counties and/or cities in 22 provinces throughout China. Using a strategic sampling design, each centenarian in the sampling frame was assigned a pre-designated random code and one nearby octogenarian and one nonagenarian with a pre-designated age and sex were interviewed. The term 'nearby' indicates the same village (or the same street, if applicable) or the same town, county, city. The purpose of the sampling strategy is to generate comparable numbers of relatively random male and female octogenarians and nonagenarians at each age from 80 to 99 (see Zeng et al. 2002 for details). Four waves have been successfully conducted in 1998, 2000, 2002, and 2005 so far; and the fifth wave will be conducted in 2008. In addition to 11,175 oldest-old respondents aged 80 and over, the 2002 wave started to include 4,845 young elders (ages 65 to 79) to allow comparative analyses between the oldest-old and young elders. Further description of the sampling design and data quality for the CLHLS is available elsewhere (Gu 2007; Gu and Dupre 2008; Zeng et al. 2001, 2002; Zeng and Gu 2008).

Data from the OSSCE and CLHLS are combined to provide two national datasets across a 10-year period. The two surveys cover a total of 23 geographic areas, with interviews from both surveys in the following 12 provinces/cities: Beijing, Tianjin, Hebei, Heilongjiang, Shanghai, Jiangsu, Zhejiang, Hubei, Guangxi, Sichuan, Chongqing, and Shaanxi. Comparable data on the demographic characteristics, healthcare resources, and health conditions of participants were collected in both surveys. The 1992 OSSCE sample includes 12,620 interviewed persons aged 65 and over (n = 6,590 women and 6,030 men). Of the 12,620 interviewees, 1,454 were ages 80 and over and 11,166 respondents were ages 65 to 79. The 1992 OSSCE survey did not collect data on institutionalized persons and therefore we dropped the institutionalized adults in the 2002 CLHLS. The remaining number of individuals in the 2002 CLHLS survey who were from the overlapping provinces as in the 1992 OSSCE survey include 9,583 interviewees, consisting of 5,493 women and 4,090 men with 6,544 oldest-old aged 80 and over, and 3,039 young elders aged 65-79. The combined sample for analysis includes 22,203 respondents.

Measures

Life satisfaction. Life satisfaction is measured by a single question in both the OSSCE and the CLHLS rated by the respondent. The self-rated life satisfaction (SRLS) in the OSSCE has three categories (good, so so, poor), whereas the SRLS in the CLHLS has five categories (very good, good, so so, poor, very poor). We collapsed life satisfaction into a dichotomous variable: poor vs others. In the CLHLS, category of very poor is considered as poor.¹

Control variables. To obtain unbiased estimates of change of SRLS from 1992 to 2002, we adjust for individual differences in demographic characteristics, socioeconomic status (SES), healthcare resources, and health conditions. Demographic variables include age (in single year), sex, residence (urban vs. rural), and ethnicity (Han vs. non-Han minorities). Measures of SES include categorical levels of education (having 1+ schooling vs. no) and a dichotomous indicator of economic well-being (sufficient financial resources in daily life vs. not). Variables capturing family and healthcare resources include current marital status (currently married vs. not), living arrangement (alone, with spouse only, with family, and with others), childless, and whether the respondent is covered by free public medical services (yes vs. no). Psychological disposition includes whether the respondent feel lonely. Health conditions include activities of daily living (ADL) disability, chronic conditions, and self-rated health (SRH). First, we use an abbreviated version of Katz' ADL index based on compatible responses for the 1992 and 2002 surveys (Gu and Zeng 2006). Second, the CLHLS collected information on seventeen diseases (including hypertension, stroke, heart diseases, cerebrovascular disease, pneumonia, arthritis and so forth). Comparisons of prevalence rates in the CLHLS with the Chinese National Health Services Survey (Minister of Health 2002; 2005) and the 2000 Chinese Elderly Survey (CNRCA 2003) indicated that data on chronic conditions in the CLHLS are valid and reliable (Gu and Dupre 2007). In this analysis, we operationalize chronic disease as having at least one disease (coded 1) compared to no diseases. SRH in the 1992 survey were based on three response categories (good, so-so, and bad) whereas the 2002 survey responses were based on six categories (very good, good, so-so, bad, very bad, and unable to answer). Persons who were "unable to answer" in the 2002 CLHLS were deemed too sick to be interviewed (i.e., proxy response), and therefore, were assigned a "very bad" SRH score. We collapsed the "very good" responses into the "good" category and grouped the remaining responses into a "not good" SRH category for the 2002

¹ We also used three categories. The results are more or less the same as binary outcomes.

CLHLS. For the 1992 OSSCE, we categorized the “so-so” and “bad” responses into the “not good” SRH assessment. Thus, the outcome measure is dichotomized as good (coded 1) versus not good SRH². Table 1 presents the sample distributions of the study variables for the 1992 and 2002 surveys.

Analytic Strategy

Standardization. Studies suggest that variations in survey design and individual heterogeneity introduce bias when comparing changes in some indicator (e.g., health) across time periods (Freedman et al. 2004). Accordingly, standardization by sex (e.g., Feldman et al. 2002; 2004) and urban/rural residence (e.g., Gu and Zeng 2004; Zeng et al. 2001; Laditka 2005) is essential for analyzing the changes in life satisfaction in the OSSCE and the CLHLS since their sampling design is entirely different. We first applied separate weights to match the total age-sex-urban/rural distributions in the thirteen overlapping provinces in 1992 and 2002 surveys. Following a similar method as previously documented in addressing the health changes (Freedman et al., 2004), we then standardized the age-sex-urban/rural compositions of the two datasets. To do so, a new weight was generated to reflect the average age-sex-urban/rural composition of two combined populations in sampled provinces in 1992 and 2002. All analyses are based on this constructed weight and multiple imputation methods are used to reduce the inferential bias associated with excluding respondents who have missing data. Following the previous findings and suggestions that analysis of association of life satisfaction should be gender-specific given that the patterns of variables associated with life satisfaction in men and women are different (Berg et al. 2006), we run model separately for men and women.

Logistic regression. Multiple logistic regression models are used to examine how the changes in life satisfaction are modified by several confounding variables. We use the following model and delta method to estimate the change of life satisfaction (Waidmann and Liu, 2000; Greene, 2000):

$\log\left(\frac{p_j}{1-p_j}\right) = \beta_{0j} + \sum_i \beta_{ij}x_{ij} + \gamma_j t$, where p_j is the probability of being in a given category (or event) for observation j , $\beta_{ij}x_{ij}$ is the product of explanatory variable x_{ij} and the unknown β_{ij} coefficient for observation j . Note that t distinguishes the year of the survey (1992 and 2002) and is added to the regression model to estimate the change between survey intervals. γ_j is an unknown coefficient. We estimate four sequential models to examine how each confounding factor influences the change in life satisfaction. Model I investigates the change in life satisfaction adjusting for age, residence, and ethnicity.³ The initial model serves as the baseline for the standardized results. Model II examines how the change in life satisfaction is related to the inclusion of the SES variables. Model III further assesses the mediated effects on the change by adding the measures of family and healthcare resources. Model IV adds whether the respondent feel lonely into Model III to see the mediated effect of psychological disposition. Model V additionally controls for health condition such as ADL, SRH, and chronic diseases to see how health condition mediated the changes in life satisfaction. Model VI examines how change is

² The results are more or less the same if we combine “so so” with “good” and “very good”.

³ Preliminary analyses also tested an age-squared term and an interaction between age and survey year. Neither variable was significant and are excluded from the final models.

different across each of above covariate by testing the interaction with the year of survey. In the final model of Model VI only those significant interactions are included.

SUMMARY OF RESULTS

Preliminary results are summarized as below:

- (1) Controlling for basic demographic factors (Model 1), the odds of reporting poor life satisfaction in 2002 was 17% and 19% higher than in 1992 for women and men respectively. But the differences are not statistically significant.
- (2) However, once individual SES was added, the odds ratios of reporting poor life satisfaction in 2002 for women and men increased to 168% and 194% and statistically significant.
- (3) Adding family and healthcare resources, the odds ratios in 2002 almost had no change: 164% for women and 193% for men.
- (4) Further controlling for loneliness, odds ratios in 2002 increased to 221% for women and 262% for men.
- (5) Controlling for health condition, odds ratios in 2002 continued to increase to 258% for women and 272% for men.
- (6) Adding interaction of loneliness with year, odds ratios in 2002 (main effects) were 185% for women and 189% for men.

Conclusions:

I. Trend

- (1) Both women and men experienced a similar worsening trend in life satisfaction from 1992 to 2002.
- (2) All elders regardless of their characteristics experienced a decline in life satisfaction in the period of 1992-2002.
- (3) Those who feel lonely experienced more decline in life satisfaction.

II. Factors associated with life satisfaction

- (1) Although the overall life satisfaction and its trend are similar between men and women, their associates are different.
- (2) Age is a significant predictor of life satisfaction in women, but it is not in men.
- (3) The overall level of life satisfaction is similar between urban and rural residents and between Han and non-Han ethnicities.
- (4) Better financial condition improves the life satisfaction for both men and women. But education has no effect among women.
- (5) Marriage has no significant relationship with life satisfaction in men, but currently married women tend to rate their life satisfaction poorer.
- (6) Coresiding with children improves the life satisfaction as compared to living alone. Childlessness is a risk factor of life satisfaction, but its significant effect disappears when other family and healthcare resources are present.
- (7) High proximity with children increases the odds of poor life satisfaction in men. Access to public healthcare improves the life satisfaction among women.
- (8) With one exception for women, ADL, SRH, and chronic disease are all risk factors of poor life satisfaction.

(9) On average, individual's SES and healthcare resources slightly improved from 1992 to 2002. Health conditions were slightly improved from 1992 to 2002.

We will discuss possible underlying causes that led to this worsening trend and policy implications.

REFERENCES

- Berg, A. I., Hassing, L. B., McClearn, G. E. and Johansson, B. (2006). What matters for life satisfaction in the oldest-old? *Aging & Mental Health*, 10(3), 257 - 264.
- Bowling, A., and Farquhar, M. (1996). Associations with changes in life satisfaction among three samples of elderly people living at home. *International Journal of Geriatric Psychiatry*, 11, 1077-1087.
- Chen, C. (2001). Aging and life satisfaction. *Social Indicators Research*, 54, 57–79.
- China National Research Center on Aging (CNRCA).(1994). *Data Book of Old-age Support Survey on Chinese Elderly*. Beijing: Hualin Press.
- Cheung, C.-K., and Leung, K.-K. (2004). Forming life satisfaction among different social groups during the modernization of China. *Journal of Happiness Studies*, 5(1), 23–56.
- Easterlin, R. A. (2003). Explaining happiness. *Proceedings of the National Academy of Sciences*, 100, 11176–11183.
- Fagerström, C., Borg, C., Balducci, C., Burholt, V., Wenger, C. G., Ferring, D., Weber, G., Holst, G., and Hillberg, I.R. (2007). Life satisfaction and associated factors among people aged 60 years and above in six European countries. *Applied Research in Quality of Life*, 2, 33–50.
- Freedman, V.A., Crimmins, E.M., Schoeni, R. F., Spillman, B.C., Aykan, H., Kramarow, E., Land, K.C., Lubitz, J., Manton, K. G., Martin, L. G., Shinberg, D., and Waidmann, T. (2004). Resolving inconsistencies in trends in old-age disability: Report from a technical working group. *Demography*, 41(3), 417-441.
- Laditka, S.(2005). *Healthy Life Expectancy among Older Americans in Rural and Urban Areas*. Paper presented at REVES 2005 Conference on Population Health and Health Expectancy - Policy Implications. 18-20 May 2005, Beijing.
- Frijters, P., Haisken-DeNew, J. P., and Shields, M.A. (2004). Investigating the patterns and determinants of life satisfaction in Germany following reunification. *The Journal of Human Resources*, 39(3), 649-674.
- Gray, G. R., Ventis, D. G. and Hayslip, B. Jr. (1992). Socio-cognitive skills as a determinant of life satisfaction in aged persons, *International Journal of Aging and Human Development* 35(3): 205–218.
- Greene, W.H. (2000). *Econometric Analysis*. New York: Macmillan.
- Gu, D. (2008). General data assessment of the Chinese Longitudinal Healthy Longevity Survey in 2002. In *Healthy Longevity in China: Demographic, Socioeconomic, and Psychological Dimensions*, edited by Y. Zeng, D.L. Poston, D.A. Vlosky, and D. Gu. Pp39-59. Dordrecht, The Netherlands: Springer Publisher.
- Gu, D., and Dupre, M.E. (2008). Assessment of reliability of mortality and morbidity in the 1998-2002 CLHLS waves. In *Healthy Longevity in China: Demographic, Socioeconomic, and Psychological Dimensions*, edited by Y. Zeng, D. L. Poston, D.A. Vlosky, and D. Gu. Pp 101-117. Dordrecht, The Netherlands: Springer Publisher.
- Gu, D., Dupre, M.E., and Liu, G. (2007). Characteristics of the Institutionalized and Community-residing Oldest-old in China. *Social Science & Medicine*, 64, 871-883.
- Gu, D. and Vlosky, D.A. (2008). Long-term Care and Related Issues in China. Forthcoming in *Social Sciences in Health Care and Medicine*. Edited by Frank Columbus. Nova Publisher.
- Gu, D., and Zeng, Y. (2004). Sociodemographic effects on onset and recovery of ADL disability among Chinese oldest-old, *Demographic Research*, 11,1-42.

- Hamarat, E., Thompson, D., Aysan, F., Steele, D., Matheny, K., and Simons, C. (2002). Age differences in coping resources and satisfaction with life among middle-aged, young-old, and oldest-old adults. *The Journal of Genetic Psychology; Child Behavior, Animal Behavior, and Comparative Psychology*, 163(3), 360–367.
- Heller, D., Watson, D., and Ilies, R. (2004). *The role of person vs. situation in life satisfaction: A critical examination*. Unpublished manuscript, *Psychological Bulletin*, 130(4), 574–600
- Ji, J. J., Xu, X. H., and Rich, S. L. (2002). Determinants of family life satisfaction in reforming urban China. *International Journal of Comparative Sociology*, 43, 169–191.
- Lawton, M. P. 1983. Environment and other determinants of well-being in older people. *The Gerontologist* 23, 349–357.
- Menec, V. H. (2003). The relation between everyday activities and successful aging: A 6-year longitudinal study. *Journals of Gerontology series B: Psychological Sciences and Social Sciences*, 58(2), S74–82.
- Murtagh, K. N., and Hubert, H. B. (2004). Gender differences in physical disability among an elderly cohort. *American Journal of Public Health*, 94(8), 1406–1411.
- Mroczek, D. K. and Spiro, A. III. (2005). Change in life satisfaction during adulthood: findings from the veterans affairs normative aging study. *Journal of Personality and Social Psychology*, 88(1), 189–202
- Myers, D. G., and Diener, E. (1995). Who is happy? *Psychological Science*, 6(1), 10–19.
- Newsom, J. T., and Schulz, R. (1996). Social support as a mediator in the relation between functional status and quality of life in older adults. *Psychology and Aging*, 11(1), 34–44.
- Pinquart, M., and Sorensen, S. (2000). Influences of socioeconomic status, social network, and competence on subjective wellbeing in later life: A meta-analysis. *Psychology and Aging*, 15(2), 187–224
- Pinquart, M., and Sorensen, S. (2001). Gender differences in self-concept and psychological well-being in old age: A meta-analysis. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 56(4), P195–213.
- Revicki, D. A. and Mitchell, J. P. (1990). Strain, social support and mental health in rural elderly individuals. *Journal of Gerontology* 45, S267–274.
- Schimmack, U., Radhakrishnan, P., Oishi, S., Dzokoto, V., & Ahadi, S. (2002). Culture, personality, and subjective well-being: Integrating process models of life satisfaction. *Journal of Personality and Social Psychology*, 82, 582–593.
- Shank, D. and Keith, J. 1995. Culture as constraint and potential for a long-lived society. In M. M. Seltzer (ed.). *The impact of increases life expectancy: Beyond the gray horizon*. Pp. 87–108. New York: Springer Publishing Company.
- Silverstein, M., Cong, Z., and Li, S. (2006). Intergenerational transfers and living arrangements of older people in rural China: Consequences for psychological well-being. *The Journals of Gerontology*, 61B, S256–S266.
- Thomas, M.E., and Holmes, B.J. (1992). Determinants of satisfaction for blacks and whites. *The Sociological Quarterly*, 33(3), 459–472.
- Thumboo, J., Fong, K-Y., Machin, D., Chan, S-P., Soh, C-H., Leong, K-H., Feng, P-H., Thio, S-T. and Boey, M-L. (2003). Quality of life in an urban Asian population: the impact of ethnicity and socio-economic status. *Social Science and Medicine* 56, 1761–1772.
- Tsang, E.Y.L., Liamputtong, P., and Pierson, J. (2004). The views of older Chinese people in Melbourne about their quality of life. *Ageing and Society*, 24, 51–74.

- Waidmann, T., and Liu, K. (2000). Disability trends among the elderly and implications for the future. *Journal of Gerontology: Psychology and Social Sciences*, 56(B), S298-S307.
- Wang, C. W., Iwaya, T., Kumano, H., Suzukamo, Y., Tobimatsu, Y., and Fukudo, S. (2002). Relationship of health status and social support to the life satisfaction of older adults. *Tohoku Journal of Experimental Medicine*, 198(3), 141–149.
- Waters, W. E., Heikinen, E. and Dontas, A. S. (1989). *Health, Lifestyles and Services for the Elderly*. Public Health in Europe No. 29. World Health Organization, Copenhagen.
- Zeng, Y., and Gu. D. (2008). Reliability of age reporting among the Chinese oldest-old in the CLHLS datasets. In *Healthy Longevity in China: Demographic, Socioeconomic, and Psychological Dimensions*, edited by Y. Zeng, D. L. Poston, D.A. Vlosky, and D. Gu. Pp61-79. Dordrecht, The Netherlands: Springer Publisher.
- Zeng, Y., Vaupel, J.W. Xiao, Z., Zhang, C., and Liu, Y. (2001). The Health Longevity Survey and the active life expectancy of the oldest old in China. *Population: An English Selection*, 13(1): 95-116.
- Zeng, Y., Vaupel, J.W. Xiao, Z., Zhang, C., and Liu, Y. (2002). Sociodemographic and health profiles of the oldest old in China. *Population and Development Review*, 28, 251-273.
- Zhang, A., and Y. L. (1998). Life satisfaction among Chinese elderly in Beijing. *Journal of Cross-cultural Gerontology*, 13, 105-125.
- Zhang, W., and Liu, G. (2007). Childlessness, psychological well-being, and life satisfaction among the elderly in China. *Journal of Cross-cultural Gerontology*, 22, 185-203.