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ADDING LIFE TO YEARS: PREDICTING SUBJECTIVE QUALITY OF LIFE AMONG CHINESE OLDEST-OLD

by

HUALI QIN

Under the Direction of Heying Jenny Zhan

ABSTRACT

This study is proposed to examine the relationship between individual and socio-economic factors and subjective quality of life (SQOL) among the Chinese oldest-old. Data was collected from the latest wave of Chinese healthy longevity survey in 2002. The sample of this survey consisted of 11,175 oldest-old who were aged 80 and above at the time of the survey. Kruskal-Wallis test and Mann-Whitney *U* test were used to examine age, gender, and living arrangements differences in SQOL among Chinese oldest-old. Multiple regression analysis was conducted to understand the influences of individual and socio-economic factors as four groups of predictor variables in SQOL among the oldest-old. The results showed that living with offspring, having children's frequent visits, living in an institution, participation in activities, higher self-rated health, and higher MMSE scores were positively related to SQOL. Living alone, in rural areas, and having better ADL functions were negatively related to SQOL among Chinese oldest-old. Centenarians and nonagenarians were found to have higher ratings of SQOL than octogenarians. This study may provide insights on how social, cultural, and familial factors influence subjective well-being in the very old age. Study findings may have policy implications for the promotion of quality of life for older adults, specifically, the oldest-old in China.

INDEX WORDS: Subjective Quality of Life, Oldest-Old, China

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by

HUALI QIN

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of

Master of Arts

in the College of Arts and Sciences

Georgia State University

2007

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2007

ADDING LIFE TO YEARS: PREDICTING SUBJECTIVE QUALITY OF LIFE AMONG CHINESE OLDEST-OLD

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May 2007

ACKNOWLEDGEMENT

Nothing in a simple sheet of paper can express the gratitude I hold for the people who made my thesis-completion and graduation possible. My first debt of gratitude must go to my advisor, Dr. Heying Jenny Zhan. I am amazingly fortunate to have an advisor who has been an essential stabilizing and supporting force for my study all along. Her contributions to this thesis have been immense. She has tirelessly reviewed my thesis page after page and time and time again. With her encouragement, advice, and care, my graduate experience has been so meaningful that I will cherish forever.

I cannot tell how hard it would be for me to carry out my study in time without the help of Dr. Frank J. Whittington. He has offered me a combination of moral and substantive support since the day I entered the program. With good humor and graceful manner, he always has been ready and eager to help. I am greatly indebted to him for his being an actual example to learn the ways of concise thinking and altruistic considerations.

I would like to give my heartfelt thanks to Dr. Yong "Tai" Wang. He has impressed me with his passion for statistics; and he helped build up my knowledge and skills for data analysis. A number of times he has taken time off from work and even rest to help me with the technical details of my data analysis. I am deeply grateful to him for his detailed comments and his patient discussions with me, which enriched my learning and ensured that analyses were performed in a best way possible.

I feel that I have been blessed with such a group of committee members that I cannot imagine a better one for my study. Besides, I owe my every joyful achievement and every

enjoyable moment during my study to the people in the Gerontology Institute. At every step of the way, they have been with me. They have provided me a warm and caring working environment I have ever had. I would treasure their regards and assistance in my life.

There are no words which could express my gratitude to my devoted parents. I can only say it is my honor to be their only child, to have their name, and to carry their genetic gifts.

For all emotional and physical investment these people have offered to me, they have my sincerest thanks, respects, and my love.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS……..... iv

LIST OF TABLES……..... viii

LIST OF FIGURES……..... ix

LIST OF ABBREVIATIONS……..... x

CHAPTER

I. BACKGROUND…….……..... 1

Introduction…….. 1

Background……..... 3

Conceptual Framework…… 5

Literature Review…… 7

Research Objectives and Hypothesis……... 15

II. METHODOLOGY…….. 19

Research Setting and Sample……... 19

Measures…….. 20

Data Analysis……...… 22

III. RESULTS……... 24

Profile of the Respondents……... 24

Levels of SQOL Reported by the Respondents……... 27

Socio-Demographic Differences in SQOL among the Oldest-Old……..…..... 27

Roles of Individual and Socio-Environmental Factors in Predicting SQOL…... 30

IV. DISCUSSION AND IMPLICATIONS…….……. 36

Social, Cultural, and Familial Context and Oldest-Old's SWB……..... 36

Individual Factors and SWB among the Oldest-Old…….....……. 41

Theoretical Implications of the Study…….. 44

Policy Implications…….. 45

Conclusion……..... 47

REFERENCES…… 50

LIST OF TABLES

TABLE

1	Categories and Codes of Variables	20
2	Profile of the Oldest-old Respondents	26
3	Mann-Whitney *U* test Results of Socio-demographic Differences in SQOL	28
4	Spearman's Correlation Coefficients	31
5	Multiple Regression Results for Variables Predicting SQOL	35

LIST OF FIGURES

FIGURE

1	Conceptual Model of SQOL	7
2	Frequency Distribution of SQOL among the Respondents	27

LIST OF ABBREVIATIONS

QOL	Quality of Life
WHOQOL	World Health Organization's Quality of Life
SQOL	Subjective Quality of Life
SWB	Subjective Well-Being
SPSS	Statistical Package for the Social Sciences

CHAPTER I

BACKGROUND

Introduction

To live a "good" life is a desire of many people. Today, biomedical science seems capable of offering a long life to most of us. Yet there is a quality as well as a quantity component to the yearning for longevity. A lengthened life that steadily debilitates into long years of acute suffering is not an attractive proposition. Improving quality of life (QOL) in old age, therefore, should be balanced with multiplying quantity of years. Holding this two-sided view, gerontologists have struggled unceasingly to help with adding life to years, not just more years to life.

Along with the worldwide population aging, the importance of improving QOL and well-being among older adults has attracted considerable attention in recent years. Existing literature so far has provided consistent findings showing that older adults' QOL is influenced by personal and environmental factors and their interactions (Bramston, Chipuer, & Pretty, 2005). Many individual- and family-related factors, which greatly influence older adults' perceived satisfaction, are embedded in socio-cultural contexts. Also, the World Health Organization's Quality of Life (WHOQOL) Group has defined the concept of QOL as "an individual's perception of their position in life, in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (WHOQOL-Group, 1993). Accordingly, when focusing on the multidimensional nature of QOL and how it is

affected at the end of life, we should consider the profound influence of social and cultural factors. For instance, in China, there is a societal difference between rural and urban areas, in pension and health care coverage and patterns of intergenerational exchange. In addition, Chinese cultural norm of *xiao* (or filial piety) exerts significant influence in the care behaviors toward elders and their living arrangements (Zhan, Liu, & Bai, 2005; Zhan, Liu, & Guan, 2006; Zhan & Montgomery, 2003). Filial piety or *xiao* is a "Confucian concept that encompasses a broad range of behaviors, including children's respect, obedience, loyalty, material provision, and physical care to parents" (Zhan & Montgomery, 2003: p.210). It is, therefore, reasonable to assume that these socio-cultural and familial characteristics in the Chinese context will affect QOL among Chinese elders directly and indirectly as well.

Due to China's large population, the magnitude of its aging population is immense. Specifically, China has the largest number of people aged 80 or above, 11.5 million in 2000, in the world (United Nations, 2001). The well-being of such a large number of Chinese oldest-old is a societal issue that requires attention from researchers, social workers, and policymakers as well.

In the current study, I applied WHOQOL Group's definition of QOL, focusing on subjective quality of life (SQOL) in the oldest-old group in China. Using data from the latest wave of the Chinese Health Longevity Survey in 2002, I intend to provide an overview of SQOL of the oldest-old in China. Specifically, I will explore the roles of socio-cultural factors as well as individual factors that influence the SQOL of the oldest-old.

Background

Aging Facts

Population aging is a global issue that draws attention from academic, political, and economic fields. It not only is characterized as a social issue in developed countries where it has been most prevalent, but also recognized as a social problem faced by more and more developing nations, among which China exemplifies. Due to the effects of the Chinese baby-boomers, one-child policy, increased life expectancy, and a large population, China is aging at an extraordinarily rapid speed and at an unprecedented scale. In 2000, the proportion of Chinese people aged 65 and above is 7.0% of China's total population. This proportion is expected to grow rapidly to about 16% and 23% in 2030 and 2050, respectively (United Nations, 2001).

In particular, the population aged 80 and above is growing much faster than any other age groups. Suzman, Willis and Manton (1992) identified 85 years of age as the criterion of membership in the oldest-old category. In China, *the oldest-old* was defined as people aged 80 and over (Zeng, Liu, & George, 2003). By this definition, there were about 7.7 and 11.5 million oldest-old in China in 1990 and 2000, and the numbers of this population are projected to be about 27, 64 and over 100 million in 2020, 2040 and 2050, respectively. Furthermore, the average annual rate of increase of the 80+ population between 2000 and 2050 is expected to grow twice as fast in developing nations as in the developed nations. For example, while the increase rates for the 80+ group in Canada, Japan, Germany, France and the United States are between 2.2 and 2.8%; this rate is around 4.4% in China, India and Mexico. In comparison, the annual increase rate of people aged 65+ is between 2.1 and 2.7% in the developing countries mentioned above, and around 1% in the Western countries (United Nations, 2001).

Targeting the Oldest-Old

As a consequence of the increasing ratio of the oldest-old people, the need to care for them is going to rise as their health and functional capacities decline with age. However, compared with great interest given to the old age group as a whole, research focusing on the quality of life experienced by the oldest-old individuals, or more general study on the oldest-old subpopulation, has been relatively limited.

In the United States, efforts have been made to attract academic and political attention to the oldest-old (Suzman, Willis, & Manton, 1992). Although, studies on the oldest-old people are increasing in some developed countries (Poon, 1992; Smith, Borchelt, Maier, & Jopp, 2002), their numbers are, nevertheless, small. In developing countries, such as China, few articles have addressed issues of the oldest-old, and little research is done about the oldest-old population in China until the end of the last century.

To understand the determinants of healthy longevity of the oldest-old, a large longitudinal national survey was begun in 1998. This research project was designed to represent the profile of the oldest-old Chinese for the country as a whole. Data were collected from three waves of the survey in 1998, 2000 and 2002. Since then, the lives of the oldest-old in China have been unveiled bit by bit by the research (Gu & Zeng, 2004; Liu & Zhang, 2004; Sun & Liu, 2006; Wu & Schimmele, 2006; Zeng & Vaupel, 2002; Zeng, Vaupel, Xiao, Zhang, & Liu, 2002; Zimmer, 2005). The majority of the publications based on this survey project have concerned health and its indicators, such as functional capacity and self-reported health (Gu & Zeng, 2004; Liu & Zhang, 2004; Wu & Schimmele, 2006; Zeng & Vaupel, 2002; Zimmer, 2005). However, beyond the studies of health, little is known about other aspects of the life quality among Chinese oldest-old. There has been a relatively prolific body of studies that examined the correlates of

subjective QOL and life satisfaction among the very-old folks in the Western context (Adkins, Martin, & Poon, 1996; Berg, Hassing, McClearn, & Johansson, 2006; Poon, 1992; Smith et al., 2002). Yet little is known about the subjective perception of QOL among the oldest-old who reside in non-Western societies. It is intriguing to ask whether the predictors of SQOL and life satisfaction in Western countries work in similar ways in Eastern settings with different culture background.

Conceptual Frame

Quality of life (QOL) has been defined as a multidimensional evaluation, by both intrapersonal and social-normative criteria, of the person-environment system of the individual (Lawton, 1997). It has been widely viewed as a multi-dimensional concept and contains the same components for all people (Bramston et al., 2005; Fakhoury & Priebe, 2002). Most attempts to conceptualize or measure the overall QOL propose some constellation of objective and subjective dimensions (Brekke, Kohrt, & Green, 2001). The objective part of the QOL refers to resource availability and objective life conditions, while the subjective one refers to the individual's subjective feelings and evaluations toward his/her life, such as life satisfaction (Anna Lau & Mckennaoe, 2001).

In this study, I focused on the subjective perception of QOL as one representation of the overall QOL of Chinese oldest-old. The objective resources or conditions are assumed as related factors that are reflected in personal perceptions and affect adaptation in old age.

A series of theories have been proposed to explain the influences of personal and socio-environmental factors on subjective attitudes toward aging, such as life satisfaction. The psychologically oriented theories, which include disengagement theory, continuity theory,

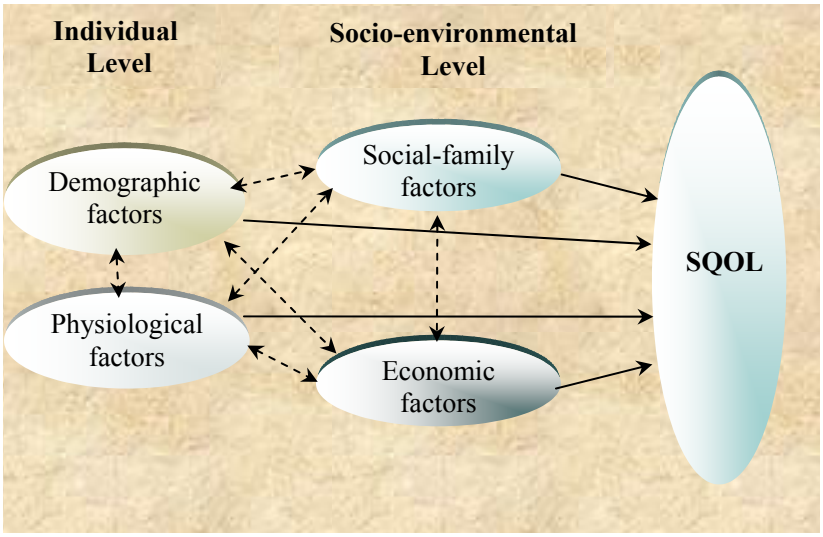
activity theory, and its later derivation of successful aging, offer insight into how older persons adapt to change as they age. The disengagement theory suggests that older adults may welcome withdrawal from society and find satisfaction in a less active lifestyle. However, the activity theory says that active engagement with life leads to a highest satisfaction in old age, whereas continuity theory suggests that continuity over life course lead to a strong self-image, good mental health, and competence in later life. Besides engagement with life, avoiding diseases and maintaining high cognitive and physical function have been viewed as the other two key components of successful aging (Rowe & Kahn, 1998).

Different from the above theories which mostly focus on the individual's adaptability to aging, political economy perspective highlights the socio-structural influences on aging. It emphasizes the relationship between socioeconomic determinants and older people's quality of life. It argues that social resources are distributed unequally on the basis of gender, class, and race due to political and economic forces. In the social context of China, for example, female and rural older persons are less likely to have pension and public medical care and consequently, they are economically disadvantaged and are more likely to have bad quality of life. Political economy perspective also allows policy-makers to offer policy interventions to improve QOL of older adults. In addition to structural factors (e.g., income, educational level), cultural factors (e.g., social norms, values and belief systems) may exert influence on intergenerational relationships, caregivers' behaviors, the older adults' own perception toward life, and on how the responsibilities in meeting the needs of the aged are distributed between family and state in a certain society. According to these perspectives, older people may differ in rates of aging and life quality if they differ in lifestyles they choose and environment they live in.

With the insights of both micro and macro-theoretical works, I constructed a conceptual

framework to explain SQOL (see Figure 1). It explores the influences of individual as well as socio-environmental factors on SQOL among the Chinese oldest-old. The individual factors in this model consist of demographic and physiological factors. The socio-environmental factors include socio-familial and economic factors. Individual factors may directly influence one's SQOL; they also may exert influence on each other or on the socio-environmental factors. Jointly, they may impact one's SQOL. Similarly, socio-environmental factors may influence one's SQOL directly, or indirectly through exerting influences on other socio-environmental factors or factors within individual level.

Figure 1. Conceptual Model of SQOL



Literature Review

Most of the existing instruments measuring SQOL use satisfaction ratings in a similar way. SQOL correlates strongly with general life satisfaction and subjective well-being (SWB) (Fakhoury & Priebe, 2002; Ranzijn & Luszcz, 2000). To provide an adequate understanding of SQOL among older adults, I will review the literature, including not only studies about

relationships between SQOL and individual (i.e., demographic and physiological factors) and socio-environmental factors (i.e., economic and socio-familial factors), but also those about effects of various factors on life satisfaction and subjective well-being in old age.

Demographic Factors

There is a general understanding that advanced age is negatively related to one's subjective well-being because of the social, physical, and psychological losses that accompany the transition to old age. It was found that life satisfaction among elders decreased as age increased beyond age 65 (C. Chen, 2001), although some survey research has suggested that the relationship is weak (George, Okun, & Landerman, 1985). Cross-sectional findings indicated that the young-old reported higher positive well-being (i.e. life satisfaction) than the oldest-old. Men reported higher life satisfaction and satisfaction with their own aging, while women reported more frequent experience of negative affect. Married persons generally reported higher SWB than people in all other categories of marital status. Regression analysis indicated that age, gender, marital status, and institutionalization together accounted for 6% of the variance in SWB (Smith et al., 2002). However, another study found the oldest-old and female were significantly more likely to report being happier in old age than their younger and male counterparts, respectively (Rudkin, 1994). Furthermore, a recent study found there was no gender difference in overall life satisfaction, whereas different patterns of variables were associated with life satisfaction in men and women (Berg et al., 2006).

Most studies about older adults' SWB have been conducted in the West. Different socio-cultural contexts in which those studies conducted should be considered in explaining the inconsistent findings on relationships between demographic factors and SWB in old age. This

study will add to the literature about older adults' SWB in a China-specific socio-cultural context.

Physiological Factors

Physiological indicators mainly involve health-related variables. Findings have provided evidence that health is critical for well-being in very old age, and health appears to have different impact on various components of SWB during old age. One study revealed that the increased risk of frailty, loss of functional capacity, and poor health in very old age may place constraints on life satisfaction and overwhelm individuals to such a degree that expressions of well-being were moderated. In other words, SWB may decline in old age mainly because of debilitating health conditions and functional impairments (Smith et al., 2002). Furthermore, among the oldest-old, high disability level, poor physical and cognitive performance, and self-rated health have been reported as predictors of mortality (Nybo et al., 2003).

Data from the Berlin Aging Study (Baltes & Baltes, 1999) indicated that both subjective health and functional health constructs were significant sources of older people's SWB. The relative unique predictive role of health indicators for SWB have been examined through hierarchical regression analyses, and the results indicated that the factors of health explained 20% of the variance in life satisfaction.

Since objective measures of health outside of laboratory settings are not always feasible, self-reported health has become a meaningful and important measure of health status as well as well-being in older adults. Liang has indicated that self-rated health represents an important element of quality of life for older people (Liang, 1986). Demographic factors (e.g., age, sex, marital status, and race) and baseline medical conditions were found to be significantly related to changes in self-rated health. Further, researchers have confirmed that self-reported health status

is a significant predictor of Chinese elders' life satisfaction (Amy Y. Zhang & Yu, 1998).

Health indicators may not only affect elders' QOL directly, but also through its influence on other factors. Earlier studies suggested that illness might only compromise perceived QOL when it was accompanied by functional impairment (Lawton, 1991). People who were more independent in daily living tasks were more likely to return to community living, have more social contacts, lead a more active lifestyle, and be more satisfied with life in general (Granger, Hamilton, & Gresham, 1988). Cognitive impairment is generally acknowledged to be related to the aging process and commonly occurs in those who are very old. Studies show that cognitive deficits in the aged are associated with decreased function in role participation and socialization and, consequently, decreased QOL (Ahlsio, Britton, Murray, & Theorell, 1984; Cockburn, Smith, & Wade, 1990).

Findings from previous studies have shown that physiological status significantly affects the QOL or life satisfaction among the general old population. It may have similar effects on the oldest-old. This study is proposing to examine the association between physiological status and SQOL among the oldest-old in China.

Economic Factors

A good economic condition also has been identified as a predictor of successful ageing. The more financially inadequate older individuals felt, the more depressed they reported and the less satisfied they were with their lives (A. Lau, Chi, & McKenna, 1998).

Findings from a cross-cultural study (Krause, Jay, & Liang, 1991) revealed that financial difficulties tended to create psychological distresses among older adults in the United States and Japan and that these effects arose primarily because financial problems tended to erode important

coping resources (i.e., personal control and self-esteem).

The life satisfaction of Chinese older adults is influenced by financial status as significantly as in the West. A study conducted in Hong Kong found that financial strain was negatively associated with successful aging indictors. Level of education was a positive factor (Chou & Chi, 2002). A more recent study from Hong Kong also reported the role of financial strain in psychological well-being in later life (Cheng & Chan, 2006). However, the data showed that whether or not children contributed financially is not crucial in older adults' well-being.

In brief, economic or financial factors (e.g., income, education) appear to affect the well-being of elders. The effects are related to elders' social and cultural environment. In societies where elders have better social security and medical care, family economic factors may play a less important role in elders' well-being. In societies such as rural China, where elders have limited access to pension and universal health care, financial strain could play a significantly more important role in elders' well-being. This proposed study will add to the existing literature in its understanding of the correlation between financial factors and well-being in old age.

Socio-Familial Factors

Socio-familial factors include older adults' living arrangement and socio-familial support, contact, relationship, and activity issues. The positive relationship between socio-familial contact and well-being appears to increase with age, given the increased likelihood of illnesses, loss of friends and family, and functional limitations in very old age.

Data from the Georgia Centenarian Study suggested that socioeconomic resources have a stronger effect on mental and functional health than individual resources. The more social resources the older adults had, the better mental and functional health they appeared to enjoy

(Martin, 2002). Study findings also indicated that higher social support is related to lower levels of loneliness (Martin, Hagberg, & Poon, 1997). Living alone and having a depleted social network may make the oldest-old particularly vulnerable to loneliness. People with good social support are less likely to be depressed or to experience decreased life satisfaction (Chi & Boey, 1994). Social support and contact seemed to moderate the deleterious effects of health problems on changes in life satisfaction in late and very late life. A recent study found that subjective ratings of successful aging were not significantly related to several demographic characteristics but with the number of close friends (Montross et al., 2006). A study from China further confirmed the positive relationship between friendship and successful ageing. It suggested that the larger the number of close relatives and the more frequent contacts with friends, the higher the score of successful aging indicators among elders (Chou & Chi, 2002).

Living arrangement is one of the important factors of social support. It is critically important to older adults' quality of life and well-being. Earlier studies reported a relationship between the respondent's life satisfaction and living arrangement, showing that the closer the caretaker lived to the older respondent, the higher the respondent's life satisfaction (Amy Y. Zhang & Yu, 1998). In addition, researchers pointed out that elders living in institutions were an identifiable subgroup of older adults who appeared to be at risk for lowered well-being (Baltes & Baltes, 1999; Lawton, 1991). Furthermore, older people's living arrangements are influenced by some socioeconomic factors, such as social class (Greenwell & Bengtson, 1997).

Active engagement was a common way of social contact, and it was found to be significantly correlated with subjective ratings of successful aging (Montross et al., 2006). A study about the older adults with physical disabilities found that participation in interpersonal relationships, responsibilities, fitness and recreation were related to QOL (Levasseur, Desrosiers,

& Noreau, 2004). Also, a very recent study illustrated that activity factors (e.g., independent home activities, free out-of-home activities, and involvement in popular culture) contributed significantly to retirees' life satisfaction (Nimrod, 2007). Social activities can also be a form of leisure, the benefits of which have already been acknowledged by older people, particularly those living in the community (Hersch, 1990).

While social participation appears to be associated with QOL of older adults (Levasseur et al., 2004), quality of the socio-familial relationships is found to be a stronger predictor of well-being than activity participation (Litwin & Shiovitz, 2006). For Chinese elders, the quality of family life is the focus of their social lives. The Chinese culture has always emphasized harmonious family relations. Researchers found that stressful family relationships and lack of family care precipitated Chinese elders' poor psychological well-being (Amy Y Zhang et al., 1997). Moreover, the Chinese elders' life satisfaction is distinctively affected by family relations and the geographic proximity of the primary family caregiver (Amy Y. Zhang & Yu, 1998). These findings suggest that two factors, family relations and familial care, are essential for maintaining Chinese elders' SWB.

These family-related factors are embedded in the socio-cultural context. In the case of China, quite a number of studies suggest that filial piety plays a particularly important role in socio-familial support in the Chinese context (Zhan, Liu, & Bai, 2006; Zhan & Montgomery, 2003). Traditionally Chinese elders have lived with sons in a multi-generational extended family due to the patrilocal belief in male offspring's filial responsibility. According to findings from one study, the closer the son, as the primary caregiver, lived to the elder, the higher life satisfaction the elders perceived (Amy Y. Zhang & Yu, 1998). This finding suggests that

fulfillment of this cultural expectation exerted a tangible positive impact on elders' life satisfaction. However, recent evidence suggests that co-residence with a daughter as the primary caregiver is becoming more acceptable among Chinese elders in urban China (Zhan & Montgomery, 2003). Further research is needed to examine the relationship between living arrangement (e.g., living with son vs. with daughter) and the well-being of Chinese elders.

Studies on Chinese Oldest-Old

Data analysis based on the 1998 national survey presented the current status of the oldest-old in China. The sample consisted of the oldest-old, aged 80 and above. It is the first large survey of the oldest-old ever conducted in a developing country (Zeng et al., 2002). The results show that there were many more oldest-old females than males in China at that time. However, oldest-old females in China were seriously disadvantaged as they were much more likely to be widowed, much less likely to have pensions. They were less educated, more economically dependent, more likely to rely on children for support, more likely to be disabled, cognitively impaired and in poor health status, and less likely to use long-term-care facilities. In addition, the rural oldest-old were disadvantaged because of the urban-rural gap in economic, employment, and health care. However, the rural oldest-old were found to have better ADL scores (Zeng et al., 2003; Zeng et al., 2002). Nevertheless, the gender differences in life satisfaction among Chinese oldest-old were rather small, and the rural-urban difference was not substantive, either (Zeng & Vaupel, 2002).

In the literature about the oldest-old in China, health is the most frequently studied factor. Health was found associated with a wide range of QOL indicators of the oldest-old Chinese. One finding that needs to be noted here is that centenarians reported better health status than younger

oldest-old did when objective physical health status was controlled (Liu & Zhang, 2004). Do the centenarians among the oldest-old similarly rate their general QOL higher than younger oldest-old groups? This question is intriguing and worth exploring.

Despite plenty of literature having addressed QOL in old age and the burgeoning research regarding the oldest-old in China, I found that no study had explored the relationship between a wide range of factors and SQOL among Chinese oldest-old. It is unclear how Chinese oldest-old with different personal and contextual characteristics evaluate their overall QOL. The proposed study will make a contribution in this way. In addition, because of accumulated adverse events in very old age, it seems that socio-familial resources become increasingly important to the well-being of older people with age. In China, where filial piety is a highly esteemed social norm, it is reasonable to expect that familial factors are correlated with QOL among the older adults, particularly, the oldest-old. Thus, in this study a great emphasis is placed on the influence of socio-familial factors in SQOL among Chinese oldest-old.

Research Objectives and Hypothesis

The objectives of the current study are: 1) to understand what socio-demographic factors are related to SQOL among Chinese oldest-old, and 2) to assess the extent of influence of both individual and socio-environmental factors in predicting SQOL among Chinese oldest-old. Based on these research objectives and earlier study findings in the literature, three groups of hypotheses are proposed for testing in this study:

Hypothesis 1: There are age and gender differences in SQOL among Chinese oldest-old.

1A) There is an age-cohort difference in SQOL among Chinese oldest-old. The centenarians express higher QOL than other oldest-old.

H-1A is proposed because previous studies did not consistently show a negative correlation between age and SWB in later life, as the age effects on SWB could be compromised by other factors (Martin, 2002; Quinn, Johnson, Poon, & Martin, 1999; Zeng & Vaupel, 2002). Further, one study even found that centenarians were more likely to report their health positively than younger counterparts (Liu & Zhang, 2004). Do they also report a higher level of SQOL? This question deserves attention.

1B) There is a gender difference in SQOL among Chinese oldest-old. Male oldest-old express higher QOL than female oldest-old.

Earlier literature reveals that female older adults appear to evaluate their QOL more negatively because they suffer from more functional and socio-economic losses, and have less available resources. Do female oldest old in China express lower SQOL than males because of Chinese patriarchal culture and rapid socio-economic changes?

Hypothesis 2: Chinese oldest-old with different living arrangements report their QOL differently.

2A) The oldest-old living in rural areas report better QOL than those in urban areas. This hypothesis is proposed because earlier research results demonstrated higher levels of morale among rural oldest-old. The rural oldest-old were more active in daily living and more independent than urban participants were (Clayton, Dudley, Patterson, Lawhorn, & Poon, 1994; Zeng & Vaupel, 2002). The rural active lifestyle may reduce the negative effects of limited access to social supports and services in rural area on QOL. As a result, rural oldest-old are more likely to rate their life quality optimistically.

2B) The oldest-old living at home report better QOL than those in institutions.

The hypothesis is proposed because findings from Western nations revealed that residents in institutions are likely to experience lower levels of well-being and significant losses and feel that their lives offer little possibility for quality (Ball et al., 2000; Lawton, 1991). Further, earlier studies about Chinese elders suggested that traditional household arrangements were beneficial to older adults in Chinese society as they represented the fulfillment of a cultural ideal (Silverstein, Cong, & Li, 2006).

2C) The oldest-old living with others report better QOL than those living alone. This hypothesis is based on abundant studies showing the importance of socio-familial support in SWB among older people.

2D) The oldest-old report better QOL if they co-reside with male offspring than with female offspring. This hypothesis is formulated based on the Chinese cultural context. Previous findings regarding the relationships between Chinese elders' life satisfaction and their family relations also addressed the importance of the proximity of the male primary caregiver, instead of the female caregiver (Amy Y. Zhang & Yu, 1998).

Hypothesis 3: Both individual factors (i.e., demographic and physiological indicators) and socio-environmental factors (i.e., economic and socio-familial indicators) influence SQOL among Chinese oldest-old.

3A) Demographic factors are significantly related to SQOL among Chinese oldest-old. This hypothesis is proposed because of relatively uncertain demographic effects on SWB among older adults shown by the existing literature.

3B) Physiological status is positively related to SQOL among Chinese oldest-old. The better the physiological status of the oldest-old, the better QOL they perceive. This

hypothesis reflects a variety of research results showing that physiological status, exhibited by self-rated health, functional health, and cognitive functions, significantly affect the QOL or life satisfaction among the general old population.

3C) Economic factors are related to SQOL among Chinese oldest-old. It seems that socioeconomic resources become increasingly important to older adults' well-being as people age because adverse events cumulated with age can be mediated by socioeconomic resources. For example, a study of the oldest-old conducted in the U.S. suggested that, rather than individual resources, social and economic resources have stronger effects on mental health and ADL directly. The more social and economic resources, the better mental and functional health appears to be (Martin, 2002).

3D) Socio-familial factors are related to SQOL among Chinese oldest-old. In China, people have long conformed to the cultural norm of filial piety, which demands children's respect, contact, support, and care for older parents. Fulfillment of expectations toward these behaviors will presumably affect the perception of life quality among the oldest-old. Therefore, I propose that socio-familial factors, embedded in Chinese cultural context, will significantly affect SQOL among Chinese oldest-old.

CHAPTER II

METHODOLOGY

Setting and Sample

The data used in this study are derived from the third wave of the Chinese Longitudinal Health Longevity Survey (CLHLS) in 2002. Extensive questionnaire data including demographic variables, socioeconomic characteristics, health status, psychological characteristics, cognitive function, lifestyle, living arrangement, and so forth were collected. The CLHLS was conducted in half of the counties and cities of 22 of the 31 provinces in China, which constituted 85% of the total Chinese population. The survey adopted a multi-stage, clustered, and random sampling design, covering both urban and rural areas. There were 16,064 individuals between 65 and 105 years of age participating in the survey. The sample data in this proposed study are restricted to those aged 80 and over, further reducing the sample size to 11,175 respondents. The age reported by the Chinese oldest-old respondents in the survey was found to be generally reliable (Zeng et al., 2002). In this study, the final sample included 9,885 respondents due to missing information in self-reported quality of life.

In order to overcome the limitations of a too small sub-sample size at more advanced ages, especially for males, the survey team tried to interview all centenarians in the included areas. For each centenarian, the survey tried to match one nearby octogenarian and one nonagenarian with pre-designated age and sex, if possible. As a result, the survey over-sampled oldest-old individuals and particularly over-sampled male oldest-old.

Measures

Since data used in this study were collected using nonexperimental methods, in which subjects are measured on a variety of variables, the variables in the regression analysis are called the predictor and criterion rather than independent and the dependent variables, respectively (Green & Salkind, 2005).

Table 1. Categories and Codes of Variables

Variable	Variable coding
Self-reported QOL	1= very bad, 2= bad, 3= fair, 4= good, 5= excellent
Demographic variables	
Age	Number of years
Gender	1= female, 0= male
Marital status	1= married, 0= others
Physiological variables	
Self-reported health	1= very bad, 2= bad, 3= fair, 4= good, 5= excellent
ADL	A composite scale from six items, continuously from 6 to 18, for each item: 1= need assistance totally, 2= need assistance partly, 3= without assistance
MMSE	An aggregate score on 30 items, continuously from 0 to 30, for each item: 1= correct, 0= wrong
Economic variables	
Having pension	1= yes, 0= no
Medical cost resource	1= public medical care, 0= private pay (family+self+other)
Education	Years of schooling
Socio-familial variables	
Living alone	1= alone, 0= with household members or in nursing home
Nursing home	1= in nursing home, 0= with household members and living alone
Primary co-resident	
Spouse	1= spouse, 0= others except spouse
Offspring	1= offspring, 0= others except offspring
Others	1= others except spouse and offspring, 0= spouse and offspring
Children visits	The number of children who frequently visited
Rural residence	1= rural, 0= city and town
Leisure activities	A composite scale from five items, continuously from 5 to 25, for each item: 1= never, 2= not monthly, but sometimes, 3= not weekly, but at least once for a month, 4= not daily, but once a week, 5= almost everyday

Criterion variable. — The criterion variable in this study is SQOL. It is a one-item question asking the respondents to rate their overall quality of life as they perceived it. The response set is a five-point scale where 1 = very bad and 5 = excellent (see Table 1 for actual coding).

Predictor variables. — Predictor variables include demographic, physiological, economic, and socio-familial factors. Table 1 shows how the variables are categorized and coded.

Of the demographic variables, age is measured by the number of years since birth. To compare age differences in SQOL among the oldest-old, the sample population is divided into three sub-age groups: octogenarians (aged 80-89), nonagenarians (aged 90-99), and centenarians (aged 100 and above). Gender and marital status are all coded as dichotomous variables (see Table 1).

Physiological variables include self-reported health, functional performance, and cognitive status. Self-reported health is measured by the question, "How do you rate your health at present?" The response scale ranged from 1 = very bad to 5 = excellent. Functional performance is measured by activities of daily living (ADL). There are six items in ADL: bathing, dressing, toileting, transferring, continence, and feeding. Each item is measured by a three-point scale where 1= need assistance totally to 3 = no assistance needed. A summed ADL score ranges from 6 to 18 (Cronbach's α = 0.840). Cognitive status is measured by the Chinese version of the Mini-Mental State Examination (MMSE) adapted to Chinese older people. It has been found to be a valid measurement of cognition (Zeng & Vaupel, 2002; Zimmer, 2005). The Chinese version of the MMSE includes items on orientation, naming food, registration, attention, calculation, copy a figure, recall, and language (Z. Zhang, 2006). The total score of the 30 items

in the MMSE is 30 (Cronbach's α = 0.922).

Four variables about a respondent's economic status are explored: pension status, resources of medical cost, educational level, and main occupation before age 60. Pension status is measured by the question, "Do you have a pension?" Medical cost resources are dummy coded by 1= public medical care, 0= private pay. Education level is indicated by years of completed schooling.

The respondent's socio-familial support and relationship are measured through the following factors: living arrangement, the primary co-resident, frequency of children's contact, residential area (rural or urban), and involvement in leisure activities. The living arrangement is categorized into three groups: with household members, alone, and in a nursing home. Living alone and living in a nursing home are dummy-coded, and so is rural residence. The primary co-resident is categorized as three variables: spouse, offspring, and others. Each variable is dummy-coded. Children's contact is measured by the number of children who frequently visited. Leisure activities are measured by a composite scale of five items (Cronbach's α = 0.550): garden work, reading newspaper or books, playing cards or mah-jong, watching TV or listening to the radio, and taking part in some social activities. Each activity is measured by a five-point response set (see Table 1). A higher aggregate score on the five items suggests a higher level of participation in leisure activities.

Data Analysis

Data analyses were performed using SPSS 13.0. A *p* value of less than .05 was required for significance. The analysis began with frequency distribution and descriptive statistics of all categorized variables in the sample population. The Kruskal-Wallis test and Mann-Whitney U-

test were used to analyze differences between the octogenarians, nonagenarians, and centenarians in their SQOL (H-1A). Non-parametric tests were used because the SQOL, as the criterion variable, was not normally distributed. As the Kruskal–Wallis test revealed differences between the three age groups, the differences were subsequently examined in pairs using the Mann–Whitney U-test.

To test *H-1B* and *Hypothesis 2,* the Mann-Whitney U test was used to analyze differences between women and men (*H-1B*), those living in urban and in rural areas (*H-2A*), those living at home and in nursing homes (*H-2B*), those living with others and living alone (*H-2C*), and those co-residing with male and with female offspring (*H-2D*) in their SQOL.

The Spearman's correlation coefficient was chosen to assess the strength of the associations between each predictor variable and the criterion variable as well as correlations among the predictor variables. When two variables had a high correlation ($r > +/- .70$), only one was selected for further multiple regression analysis.

To understand the influences of the predictor variables in SQOL, a multiple regression analysis was conducted to test *Hypothesis 3*. Four groups of predictor variables as stated in *H-3A*, *B, C,* and *D*, were entered into the regression equation step by step to examine how conceptually different groups of factors influence SQOL differently.

CHAPTER III

RESULTS

Profile of the Respondents

Respondents' socio-demographic characteristics are shown in Table 2. Among the oldest-old included in the sample, octogenarians, nonagenarians, and centenarians accounted for 41.0%, 33.4%, and 25.6% of the total sample population, respectively. The mean age of the sample was 92.1 (*SD* = ±7.5). The majority of the respondents were female oldest-old (59.5%). The age and gender distribution reflected by above data is the result of the sampling strategy which over-sampled centenarians and male oldest-old with the purpose of better comparability between the data sets.

The large majority of the respondents were widowed oldest-old (79.7%), had no pension (83.4%), and no public medical care (89.0%). The average level of formal education among the sample population was 1.72 years (*SD* = ±3.33). The number of the oldest-old who had no formal educational experience (66.1%) was two times the number who had at least one-year of education in schools (33.2%).

With respect to living arrangements, a large majority of the respondents were living at home (94.3%) at the time of the survey and living with household members (79.6%). Specifically, around two thirds of the oldest-old (62.2%) were living with their offspring as their primary co-residents. The oldest-old who were living alone accounted for 14.7% of the total sample. There were 567 oldest-olds living in nursing homes, accounting for 5.7% of the total

sample. Over half (52.9%) of the respondents were living in rural areas and another half in urban areas (47.1%). All but 502 (5.1%) oldest-olds have been visited frequently by their child or children. Of the respondents, 62.2% have been visited frequently by at least one and up to four children and 17.2% have had at least five children visiting frequently.

Table 2. Profile of Chinese oldest-old Respondents (N=9,885)[a]

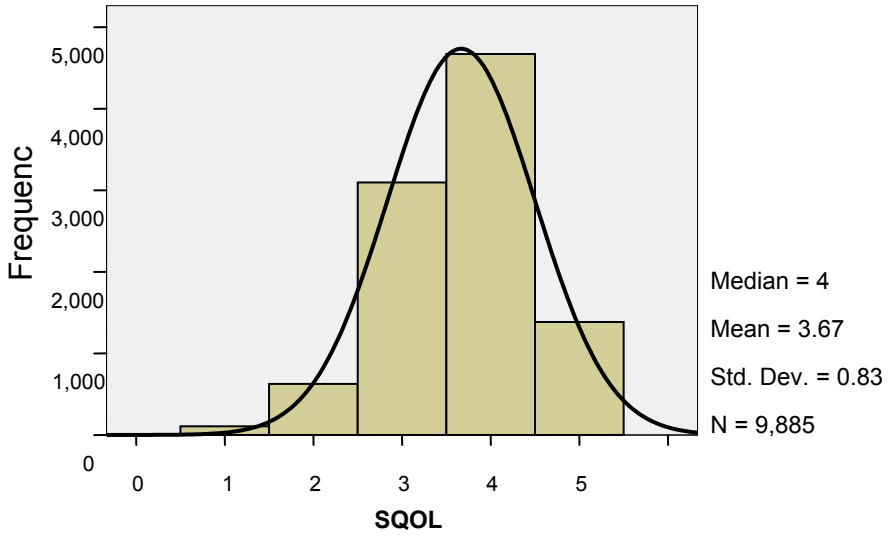
Variable	N	%
Self-reported QOL		
Very bad	107	1.1
Bad	626	6.3
Fair	3095	31.3
Good	4672	47.3
Excellent	1385	14.0
Age		
Octogenarian (80-89)	4055	41.0
Nonagenarian (90-99)	3304	33.4
Centenarian (100+)	2526	25.6
Gender		
Male	4005	40.5
Female	5880	59.5
Marital status		
Married	1709	17.3
Widowed	7876	79.7
Separated or divorced	181	1.8
Never married	119	1.2
Having pension		
Yes	1636	16.6
No	8244	83.4
Medical cost resource		
Public medical care	1073	10.9
Private pay	8800	89.0
Education level		
0	6531	66.1
≥1 year	3277	33.2
Living arrangement		
With household members	7868	79.6
Spouse (primary co-resident)	1547	15.6
Offspring (primary co-resident)	6146	62.2
Others (primary co-resident)	175	1.8
Living alone	1450	14.7
In an institution	567	5.7
Number of children visiting frequently		2.93
0	502	5.1
1-4	6146	62.2
≥ 5	1702	17.2
Residence area		
Rural	5226	52.9
Urban	4659	47.1

a. Percentages may not add up to 100% due to missing data.

Levels of SQOL Reported by the Respondents

Of the respondents, 14% reported their QOL as excellent, 47.3% as good, 31.3% as fair, and only 7.4% rated their QOL as bad or very bad (see Table 2). It is notable that over 90 percent of Chinese oldest-old rated their QOL as fair and above, and two thirds perceived good or excellent QOL. The frequency distribution of SQOL also is shown in Figure 2. It shows that the majority of SQOL values lie above the mean (3.67). The SQOL among the respondents, therefore, was a negatively skewed distribution.

Figure 2. Frequency Distribution of SQOL among the Respondents



Socio-Demographic Differences in SQOL among Chinese Oldest-Old

The results of non-parametric tests, which were conducted to evaluate what socio-demographic factors were related to SQOL among Chinese oldest-old (Hypothesis1 and Hypothesis 2*)*, are shown in Table 3.

Table 3. Mann-Whitney *U* test Results of Socio-demographic Differences in SQOL

Socio-demographic variables	N	Groups compared	Mean Rank[a]
Age			
Octogenarian	4055	Octogenarian/nonagenarian	3610.15/3765.73**
Nonagenarian	3304	Nonagenarian/centenarian	2906.14/2927.74
Centenarian	2526	Octogenarian/centenarian	3227.96/3392.20***
Gender			
Male	4005	Male/female	4962.84/4929.49
Female	5880		
Living arrangement			
Rural	5226	Rural/urban	4696.56/5219.43***
Urban	4659		
At home	9318	At home/in institutions	4906.00/5551.11***
In institutions	567		
Living with others	8435	Living with others/alone	5113.26/3952.57***
Living alone	1450		
Primary co-resident:			
Male offspring	4977	Co-resided with male/female offspring	3075.27/3065.97
Female offspring	1169		

Note: a. Significance levels: * $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed test).

Age-Cohort and Gender Differences in SQOL

A Kruskal-Wallis test was conducted to evaluate differences among the three age groups (octogenarian, nonagenarian, and centenarian) on median SQOL. The test, which was corrected for tied ranks, was significant, χ^2 (2, N = 9885) = 17.61, $P < .001$. Because the overall test was significant, pairwise comparisons among the age groups were conducted using the Mann-Whitney *U* test. The results of follow-up tests indicated significant differences between octogenarians and nonagenarians, and between octogenarians and centenarians. Nonagenarians as well as centenarians expressed higher SQOL than octogenarians did. The results support Hypothesis 1A partly, showing that centenarians did report a higher level of SQOL than octogenarians did; but they did not report significantly higher SQOL than nonagenarians did.

A Mann-Whitney *U* test was conducted to test the hypothesis that male oldest-old would express higher QOL, on the average, than female oldest-old. The results showed no statistically significant differences between gender groups on SQOL. This finding rejects Hypothesis 1B.

Influences of Living Arrangement on SQOL

The results indicated that Chinese oldest-old living in urban areas reported significantly higher QOL than those living in rural areas. This result differed from hypothesized direction shown in Hypothesis 2A, which proposed that the oldest-old living in rural areas report better QOL than those in urban areas. Thus Hypothesis 2A is rejected.

The oldest-old living at home reported significantly lower QOL than those living in institutions. This result also differed from expected direction shown in Hypothesis 2B, which suggested the oldest-old living at home would report better QOL than those in institutions. Hypothesis 2B, therefore, is rejected.

The oldest-old living with others reported higher QOL than those living alone. This result was consistent with the anticipated direction shown in Hypothesis 2C and was significant. Therefore, this finding supports Hypothesis 2C.

No statistically significant differences were found on SQOL between the oldest-old living with male and female offspring as the primary co-residents. This result rejects Hypothesis 2D. The gender of the primary co-resident seemed to have no impact on the perception of the oldest-old toward their QOL.

Roles of Individual and Socio-environmental Factors in Predicting the Oldest-Old's SQOL

Correlations between Variables

Zero-order correlation coefficients were computed among the variables before the regression analysis. The results of the correlation analyses are presented in Table 4. The correlations between the three variables, "primary co-resident was spouse," "primary co-resident was offspring," and "marital status" were higher than .70 and significant. Only the variable "primary co-resident was offspring" was selected as a predictor variable to enter the multiple regression model for further analysis. The correlations between self-reported health and SQOL, gender and education, education and pension, medical cost resource and pension, and between leisure activities and MMSE were higher than .40 but lower than .70. These correlations were considered in further discussion.

Table 4. Spearman's Correlation Coefficients

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. SQOL	1.00																
2. Age	.04**	1.00															
3. Gender	-.01	.22**	1.00														
4. Marital status	-.02	-.31**	-.35**	1.00													
5. Self-reported health	.42**	.00	-.06**	.01	1.00												
6. ADL	.02	-.32**	-.16**	.13**	.22**	1.00											
7. MMSE	.15**	-.41**	-.33**	.24**	.23**	.37**	1.00										
8. Pension	.10**	-.19**	-.33**	.23**	.06**	.04**	.29**	1.00									
9. Medical cost resource	.11**	-.13**	-.22**	.15**	.03**	.03**	.21**	.60**	1.00								
10. Education	.06**	-.23**	-.51**	.24**	.07**	.10**	.37**	.41**	.29**	1.00							
11. Alone	-.16**	-.04**	.01	-.18**	-.05**	.10**	.01	-.03**	-.04**	-.01	1.00						
12. In an institution	.06**	-.05**	-.02	-.08**	-.01	.01	-.01	.04**	.23**	.02**	-.10**	1.00					
13. Primary co-resident was spouse	-.04**	-.36**	-.38**	.95**	.00	.16**	.27**	.26**	.21**	.26**	N/A	N/A	1.00				
14. Primary co-resident was offspring	.04**	.34**	.36**	-.89**	.01	-.14**	-.26**	-.27**	-.23**	-.26**	N/A	N/A	-.93**	1.00			
15. Rural	-.10**	.06**	.01	-.05**	-.05**	.06**	-.12**	-.33**	-.26**	-.17**	.03**	-.12**	-.07**	.08**	1.00		
16. Number of visiting children	.03**	-.19**	-.15**	.17**	.02	.09**	.13**	.05**	.02	.09**	.04**	-.10**	.19**	-.18**	.03**	1.00	
17. Leisure activities	.18**	-.30**	-.27**	.21**	.20**	.23**	.46**	.36**	.28**	.37**	-.07**	.06**	.22**	-.22**	-.23**	.10**	1.00

*. Correlation is significant at the 0.01 level (2-tailed).
**. Correlation is significant at the 0.05 level (2-tailed).

Multiple Regression Model for SQOL

A multiple regression analysis was conducted to understand the influence of various factors on the SQOL. These factors were conceptualized as four groups. They were demographic, physiological, economic, and socio-familial factors. The results of the regression analysis were illustrated in Table 5. Four models were developed to examine the extent of influence of each group of variables on SQOL. Model 1 showed that the demographic factors (i.e., age and gender) accounted for a very small but statistically significant amount of the variance in SQOL, $R^2 < .01$, $p < .001$, indicating that demographic factors had a small effect on SQOL. This result supports Hypothesis 3A. Specifically, age was positively related to SQOL ($p < .001$). The more advanced the age, the more likely they perceived higher QOL. Moreover, being female was found to be negatively related to SQOL ($p < .05$).

Model 2 showed that physiological predictor variables explained 20% of the variance, $R^2 = .20$, $p < .001$. However, physiological factors did seem to show a bi-polar effect on respondents' SQOL. On the one hand, self-reported health ($p < .001$) and cognitive status, measured by MMSE ($p < .001$), were positively related to SQOL. These results support Hypothesis 3B. On the other hand, functional capability, measured by ADL, was negatively associated with SQOL ($p < .001$). The finding about the influence of functional capability on the SQOL rejects Hypothesis 3B, which hypothesized the better the physiological status of the oldest-old, the better QOL they perceive. Thus, the overall results on the influences of physiological variables partly support Hypothesis 3B. In addition, being female became a positive predictor of SQOL when physiological status was controlled for. Among the three physiological factors, self-reported health was found to be the strongest predictor for SQOL among the oldest-old ($r = .43$, $p < .001$).

Economic factors added 1% of the explained variance in SQOL ($p < .001$). The oldest-old who had pension ($p < .01$) and had public medical care paying for most of the medical cost ($p < .001$) perceived higher life quality. The elders' education level was related to their SQOL ($p < .01$). The longer school years the oldest-old have had, the higher QOL they reported. Among these factors, having public medical care was found to be the most important positive economic predictor to SQOL. These findings regarding the effects of economic factors support Hypothesis 3C.

In model 4, socio-familial factors were added into all predictor variables from previous models. The combined individual and socio-environmental variables accounted for a total of 24% of the explained variance in SQOL among the respondents ($p < .001$). Besides the effects of demographic, physiological, and economic factors, socio-familial factors explained an additional 3% ($p < .001$) of the explained variance in the respondents' SQOL. The results indicated that living with offspring as the primary co-resident and participation in leisure activities were positive predictors of SQOL ($p < .001$). Besides, the number of children who visited frequently was also positively related to SQOL ($p < .001$). Among the socio-familial factors, living alone was negatively related to SQOL and turned out to be the strongest predictor to SQOL ($r = -.12$, $p < .001$). In addition, whether the oldest-old resided in rural areas or in urban areas influenced their perception toward QOL. The results showed that living in rural areas was a negative predictor of SQOL ($p < .01$). An intriguing finding here was that living in an institution was a positive predictor of SQOL ($p < .001$). This result is consistent with those from the Mann-Whitney *U* tests conducted to examine the differences in SQOL among different living arrangements. These findings support Hypothesis 3D which proposed an association between socio-familial factors and SQOL among Chinese oldest-old. Specifically, the more socio-familial

contacts they had and the more actively they engaged in activities, the higher QOL they perceived.

This regression model for SQOL showed that health status was the strongest predictor of SQOL, followed by the group of socio-familial factors. These results add evidence to existing findings that, while health status plays a primary role in influencing the life quality of the oldest-old, socio-cultural factors also exert important effects on QOL among them.

Table 5. Multiple Regression Results for Variables Predicting SQOL in the Chinese Oldest-old Sample, 2002 [a]

Predictor Variable	Standardized Coefficients[b]			
	Model 1	Model 2	Model 3	Model 4
Demographic variables				
Age	.04***	.06***	.07***	.07***
Gender (being female)	–.02*	.02*	.05***	.05***
Physiological variables				
Self-reported health		.43***	.42***	.40***
ADL		–.07***	–.06***	–.05***
MMSE		.12***	.10***	.08***
Economic variables				
Having pension			.04**	.03**
Having public medical care			.06***	.04***
Education level			.03**	.01
Socio-familial variables				
Living alone				–.12***
In an institution				.04***
Primary co-resident was offspring				.05***
No. of Children visiting frequently				.04***
Rural residence				–.03**
Leisure activities				.08***
Constant	3.27	1.86	1.68	1.48
R^2	.00	.20	.21	.24
Adjusted R^2	.00	.20	.21	.24
R^2 change	.00***	.20***	.01***	.03***

Note: a. Criterion variable: SQOL. $N = 9{,}885$.
b. Significance levels: * $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed test).

CHAPTER IV

DISCUSSION AND IMPLICATIONS

As stated in the methodology, the main purpose of the study was to understand individual, familial, and social factors that predict the subjective perceptions of quality of life. The last chapter reported the level of SQOL among Chinese oldest-old aged 80 years and above. In this section, the roles of social, familial, and economic factors in influencing SQOL among Chinese oldest-old will be discussed. This will be followed by a discussion on the relationships between personal indicators and QOL in the very old age. Finally, implications and options for future research and practices will be discussed.

Social, Cultural, and Familial Context and Oldest-Old's SWB

Children Co-residence and Contacts

The results of this study are consistent with previous findings that socio-familial support (Chi & Boey, 1994; Martin et al., 1997) and contact (Chou & Chi, 2002; Montross et al., 2006), and participation in activities (Nimrod, 2007) were positive factors of SWB in old age. Regression results showed that living with offspring and having children's frequent visits were positive predictors for SQOL among the oldest-old.

These findings are consistent with findings from previous studies concerning Chinese older adults (X. Chen & Silverstein, 2000; Xu, 2001). These studies suggest that Chinese elders benefited from traditional family arrangements (living with younger generations) on account of strong emotional cohesion with children and fulfillment of the Chinese cultural ideal of filial

piety. Traditionally, Chinese people have believed “duo zi duo fu,” which means, the more sons/children, the more blessing and the greater happiness. Accordingly, coresiding with offspring and having more children visit represent the most satisfying fulfillment of filial piety and may directly influence the well-being of the Chinese oldest-old. Although this study reveals that elders’ SWB is positively related to children’s frequent visits, reports from earlier studies about children’s attitudes appeared to suggest an opposite effect on children. It was found that co-residence and close contacts with grandparents were negatively related to the younger generation’s levels of personal obligation toward filial responsibility (Zhan, 2004b). This difference may be one of the explanations for the emergence of nontraditional living arrangements, such as network households (children and older parents living separately but nearby), rotating households (network families in which older parents rotate among children's residences), and empty-nest households. The impact of changing living arrangements on older adults deserves great attention when studying such issues of SWB in old age.

Living Alone

The Mann-Whitney *U* test and regression analysis all showed that the oldest-old living alone perceived lower levels of QOL. Living independently has been valued in Western societies and is a preferred living arrangement for the oldest-old. In the Georgia centenarian study, about 42% lived independently (i.e., alone) (Martin et al., 1997). In China, where family ties and filial piety are greatly emphasized, living with families has always been the primary living arrangement for older adults. In this study, about 15% of the sample was living alone at the time of survey. In most of the cases, to be living alone is a consequence of widowhood or geographical separation from children. In other words, the oldest-old most likely did not make a

choice to live alone, but being alone was simply a reality. The detriments from absence of instrumental and emotional supports may become substantially more serious among the oldest old. The oldest-old living alone are more vulnerable to the impact of negative life events, more likely to feel lonely, and consequently more likely to evaluate their QOL negatively. As more and more oldest-old are likely to live alone in the foreseeable future, this issue merits more concern from academic, governmental, and familial sectors.

The implementation of one-child policy in China has altered the family structure to an inverted pyramid, possibly jeopardizing the availability of adult children in their parent care. Zhan (2004a) indicated that being the only ones available to care for aging parents in the future, only-children might feel more strongly obligated to do so than children from multiple-child families because both social and familial structure were forcing this obligation upon them. However, according to her study, only-children expressed lower levels of willingness than other children to provide care for parents when they were to face job and care conflict. As more and more children choose to pursue their careers, many may become geographically and physically unavailable for parental care in the near future (Zhan, 2004a). Moreover, as a consequence of modernization, urbanization, and globalization, more and more rural workers in relatively impoverished areas are leaving their homes to look for jobs in cities and towns, therefore, leaving their aging parents behind. The outbound migration of offspring will result in greater possibilities for older people to live alone.

Living in Institutions

Coincidently, the finding about the positive relationship between institutional residence and SQOL may give a hint for the oldest-old living alone to make a better choice, at the practical

level. The oldest-old living in institutions were found to have a higher level of SQOL than those living at home, either with or without household members. It is imaginable that the oldest old residents in institutions may benefit largely from more social contacts and activities as well as perceived supports in institutions. This finding is consistent with recent findings showing that elderly residents experienced emotional and physical improvements after moving into an institution (Zhan, Liu, & Guan, 2005). According to Zhan et al. (2005), the traditional pattern of filial care is changing and so is the attitude toward institutional care in China. Under the cultural imperative guided by traditional ideals of filial piety, children are obliged to repay their parents and assist them with material, physical, and emotional support through co-residence. However, modernization and globalization in current China have facilitated an Eastern and Western cultural integration. According to observations by some researchers, filial responsibility in the West is meant to meet the needs of the parents when they are unable to take care of themselves (Cheng & Chan, 2006). Comparing the practices of filial piety past and present, in the East and West, I would argue that filial piety in China, rather than declining, is changing in patterns by absorbing Western cultural components. With changing filial norms and rising geographic and time constrains, co-residence is no longer the only way to practice filial piety. Findings in this study as well as earlier research concur that both the older parents and adult children begin to accept institutional care. It needs to be pointed out, however, these observations mentioned above mostly occurred in urban China.

Rural-urban Disparity

The results of this study showed that rural residence was negatively related to SQOL. However, prior studies found that the rural oldest-old have significantly better ADL scores than

their urban counterpart, and no rural-urban differences were found in self-reported health, except in the case of female centenarians (Zeng et al., 2002). The disparities between the present study and previous related studies suggest that structural or socioeconomic factors, rather than physiological factors, exert important influences on SQOL. The absence of pension and public medical care in rural China may have made rural older adults, especially the oldest-old much more dependent on their offspring for material support. In addition, the absence of long-term care and other welfare programs in rural China may have made familial care necessary. Moreover, rural elders have traditionally tended to rely on their male offspring more than female offspring for material and emotional support, while urban elders rely more equally on sons and daughters. Thus, not fulfilling the expectations of filial piety from offspring, especially from the male-child was expected to affect elders' SWB. This study, on the contrary, found no difference in SQOL between the oldest-old co-residing primarily with male and female offspring. It seems that the financially dependent status and limited social welfare resources may have made rural oldest-old more vulnerable to health deterioration. Therefore, the absence of filial care, mainly due to out-migration of offspring may have influenced rural oldest-old's SWB, regardless of their gender. The widening socioeconomic and cultural gaps between urban and rural areas may have increased disparities in quality of life and well-being among the aged.

Activity Participation

This study also found that participation in leisure activities was positively associated with SQOL among the oldest-old. This finding supports a "successful aging" perspective. Engaging in leisure activities may benefit the oldest-old by expanding their communication with the broader community, meeting their needs for companionship, helping them with personal development,

and providing opportunity for self-expression and a sense of achievement. Earlier studies revealed that leisure played an important role in the lives of elderly people because it could replace past work and social roles (Hersch, 1990). Leisure activities such as playing cards and other social activities are approaches for active social contact. On the other side, reading books, watching TV, and other solitary activities seem to be behaviors of disengagement. Both activity and disengagement theories are partially supported, since as a matter of fact, there are alternative ways toward successful aging.

To summarize, this study supports the argument that socio-familial factors play an important role in influencing SWB in the oldest-old. Not coincidently, this study echoes the Berlin Aging Study which pointed to the important need for social-cultural interventions to improve the quality of life of the oldest-old (Smith et al., 2002) as well as the Georgia centenarian study which found socioeconomic resources exerted a stronger effect on the elders' well-being than individual resources (Martin, 2002).

Individual Factors and SWB among the Oldest-old

Age

Results of this study indicated that centenarians and nonagenarians perceived higher QOL than octogenarians. Regression models also indicated a positive relationship between advanced age and increased SQOL. These findings are contrary to the general assumption that the older the person, the lower levels of SWB, due to physical, psychological, and social losses alongside of transition to very old age. Results from this study displayed that the relationship between age and subjective well-being is weak and varies in directions across studies (George et al., 1985). Why are centenarians and nonagenarians more likely to view their life quality

positively than are octogenarians? The answers to this mystery may be of interest to many for a long time to come. Here, I would like to offer a few explanations in the Chinese context. First, they have survived through a century's turbulence and hardship. They have experienced wars and famine. Having seen most of their cohorts and even younger generations deceased, they may feel content with their lot at such an advanced age. Second, people in very advanced age, particularly centenarians, are called "shou xing" (the sages of longevity), who have been highly respected in the Chinese society. The sense of pride may be a positive factor for their psychological well-being. Finally, it is possible that only those people who hold an optimistic attitude in life are likely to live into a very old age.

Gender

Although previous studies indicated that Chinese female oldest-old were seriously disadvantaged in both socio-economic status and health status (Zeng et al., 2003; Z. Zhang, 2006), this study found that they perceived pretty much the same level of QOL as compared with their male counterparts. Furthermore, regression results showed that being female even was positively, though not strongly, related to SQOL after controlling for the effects of physiological and socio-economic factors. To interpret these seemingly contradictory phenomena, I propose that the oldest-old's outlook in their lives may be mainly affected by their moderate desires or expectations, rather than their actual positions or possessions. Chinese oldest old women have been living in a patriarchal society and in a disadvantaged position through most of their life journeys, with less political, social, and economic power or authority to acquire much for their own benefit. Possibly they were taught to accept what they could get. They might be used to what they had and were content with their positions. Consequently, they would not expect more,

say, a higher quality of life, no matter what the objective measures were. As women's position improves and their education levels increase, it is likely that Chinese female elders voice their discontent openly. Thus, their SQOL is likely to be more equivalent to their objective QOL.

Health status

Regression results showed that self-reported health status was the strongest predictor of the oldest-old's SQOL. This finding is consistent with results from an earlier study, which pointed out the important role of self-reported health status in predicting life satisfaction among elders in Beijing (Amy Y. Zhang & Yu, 1998). Researchers suggested that the existence of health problems may not only exert negative influence on perceptions of aging directly, but also through negative influence on perceptions of health itself to indirectly affect perceptions of aging as a whole (Jang, Poon, Kim, & Shind, 2004). In other words, older adults in poor health may have negative perception toward health, which in turn leads to a more negative perception of aging as a whole. It seems that negative evaluation of their own health status may signify actual health problems, diagnosed or not, and decreased psychological well-being. Ultimately, all these factors may impact on both objective and subjective QOL. Regression model also showed higher MMSE scores were positively related to SQOL. This finding is consistent with previous studies which indicated that cognitive function was associated with QOL through effects on role participation and socialization (Ahlsio et al., 1984; Cockburn et al., 1990).

Unlike self-reported health and cognitive function, ADL status was found to be negatively associated with SQOL. In other words, it seemed that the worse functional capacity they had, the higher level of QOL they perceived. One probable explanation for this result is: the oldest-old with decreasing functional capacity might be more likely to receive persistent familial

and social assistance. Thus, the oldest-old with lower functional capacity might have a greater sense of gratification by virtue of available and sustaining assistance.

Given the fact that health factors play the most important role in predicting SQOL among the oldest-old, I propose that continuous efforts are needed in health care for those in advanced age. Due to the limited power of biomedical intervention toward the oldest-old, however, I argue that cultural and community interactions might be more effective than biomedical ones in SWB of the oldest-old.

Theoretical Implications of the Study

This study is influenced by both macro- and micro-sociological theories, specifically the political economy paradigm in macro-theoretical perspective and activity theory in micro-theoretical approach. Political economy, according to Estes (2001), emphasizes the "broad implications of structural factors" that contribute to aging and older adults' well-being. It argues that "old age can be understood only in the context of social conditions and issues of the larger social order" (p.1). Applying this theoretical insight to the Chinese context, I would point out that the rural and urban difference in older adults' well-being is directly related to the "social order" of China. Rural elders are less likely to have a pension and public medical care, and, consequently, they are economically disadvantaged and are likely to have lower levels of quality of life.

Furthermore, the cultural context of Chinese social norms has traditionally emphasized adult children's co-residence with aging parents and their direct care for aging parents. This cultural expectation and practice probably explains why the overall SQOL rating was high among all the oldest-old and why the centenarians also rated high in their SQOL, even among

those who were actually low in their functional status.

According to activity theory, the oldest-old who kept themselves engaged in different activities, whether group activities such as games, or individual activities, such as reading or watching TV, would be more likely to have higher ratings of SQOL. This study provides support for activity theory.

Theoretically, how to understand the difference between elders who live in institutions compared to those who live with family members? Again, political economy framework may offer some insight. According to this perspective, China is experiencing major structural transformation both economically and demographically. These "structural forces" are allowing family members to make different living arrangements and place older parents in institutions when adult children are physically unavailable. When these elder-care institutions are well managed, older adults may actually prefer living in these institutions compared to at home alone or with children's family with various generational or scheduling conflicts.

Policy Implications

Based on the findings and discussions above, I would highlight the following issues, which I see as referential to usher future social policy formulation to boost SQOL and SWB among Chinese oldest-old as a whole. First, health factors continue to play the primary role in SQOL even in very old age. Health care and health benefits for older adults will continue to be one of the most important factors to ensure high quality of life among the oldest old. However, socio-cultural effects on health should not be underestimated. Health-promoting attitudes, behaviors, and environments that older adults live in as well as socio-cultural resources in which the oldest old may be imbedded may contribute to the oldest-olds' actual health status as well as

the SWB more effectively than simply offering them medications.

Secondly, future government policies may need to be more responsive to changes in living arrangements in contemporary China. Traditional living arrangements of the oldest-old (e.g., living with the oldest son's family) appear to be changing as a consequence of modernization and urbanization. Given that more children are migrating, living separately, or simply unavailable to share the same residence, the proportion of the oldest-old living alone may increase in the near future, when Chinese baby boomers enter advanced age and the one-child generation becomes the adult caregivers. Social services which currently are deficient and underdeveloped, especially for those living in rural areas, may need to be widely developed in order to enhance SWB among the oldest-old.

Thirdly, this study seems to reveal a potential of conflict in the traditional practice of *xiao* through co-residence and a changing pattern of the practice of cultural norms. Study findings reveal that elders who lived in institutions reported higher levels of SWB compared to those living with children. It could be possible that co-resident between elderly parents and adult children, though expected by the traditional norm, or *xiao*, are becoming more conflict-stricken between the generations and constraining for the elderly parents. When financial situations allow, older adults might prefer moving into an institutional setting near the children but away from the same household. If this explanation were to be true, then, the traditional definition of *xiao* may be changing. Children may view themselves and be viewed by their parents as practicing their filial piety in varied patterns such as through financial assistance or emotional support, rather than co-residing with older parents. Further studies are needed to investigate the implications for this changing pattern of living arrangements and its impact on elders SWB.

Finally, the differences in SQOL between rural and urban elders may be imputed to

socio-economic disparities between the regions. Because of this social inequality, the rural-urban disparities may even bring forth more social problems, such as the lack of health care benefits, lack of pension and social security system, and lack of unemployment benefit for almost all rural residents, which may have negative impact on the oldest-olds' well-being today and in the future.

To keep abreast of the latest demographic, economic, and socio-cultural transformations and their outcomes in SWB among the oldest old, social policies may need to be directed to the following issues. First, government policies may need to encourage the development of social services (e.g., institutional care) for the "silver market," and provide supervision of these services to ensure high quality and efficiency. Secondly, policies should be constructed to strengthen the link between the state and the community in taking care of the oldest-old living alone, in tandem with measures maintaining the social norms and cultural value of filial piety. Thirdly, high political regards should be given to facilitate pension and public medical care reform to alleviate rural-urban disparity and social inequality which in turn will benefit the disadvantaged people and those most in need, such as the rural elders and the oldest-old. Finally, it is the time to offer considerable political and social concern to the well-being of the oldest-old and related aging issues in China, by increasing the budget for health care and gerontology-related fields.

Conclusion

Although chronic illness and functional impairments limit well-being of elders especially in very old age, there is a way to facilitate their well-being through improving their life satisfaction and SQOL. This study sheds lights on what factors are related to SQOL and how to

improve SQOL through examining the influences of personal, familial, and socio-economic factors. People with a long life are a treasure of our society, and they are where the secret of health and longevity is. This study is significant in addressing the well-being in this specific group of elders, the oldest-old, and providing implications for future research and practice to some degree.

A few issues may need to be considered in interpretation of findings from this study. First, the proposed study used secondary data, collected by other researchers. No change or adjustment can be made in any way in the data collection procedure, in inclusion or exclusion biases, over-sampling biases. Second, according to the sampling strategy, the survey over-sampled centenarians and male oldest-old. Since the survey was restricted to the 22 provinces where Han Chinese people were the overwhelming majority, Han people, as an ethnic group, were over-sampled also. Although over-sampling has the advantage of greater comparability between the data sets, it may increase the difficulty of obtaining a representative understanding of the oldest-old group among all racial ethnic groups and between genders. Finally, the lack of qualitative understanding of real life situations restricts the present study in providing more meaningful explanations for the variations in SQOL among the oldest-old.

Nevertheless, the merits of this study outweigh the weaknesses. This research may make a contribution to the literature studying correlates of QOL in old age in a global perspective. The findings concerning the lives of the oldest-old in China provide benchmarks for later comparative studies between the developed and other developing nations about QOL in old age. Doing such research in the distinct cultural context rooted in Chinese society will provide an opportunity for better understanding of social and cultural influences in the lives of old people.

Because this study explores the predictors of SQOL, the perspective of older individuals

on themselves, it may provide insights in the ways they adapt to aging processes as well as the factors that influence quality of life in very advanced age. Policy implications for the promotion of SWB among older adults have been addressed. With specifically targeting the well-being among the oldest-old population, the most at-risk and most in need, the national healthcare indexes (e.g., life expectancy) may be eventually improved in an efficient way. In brief, this study has attached importance to issues of adding life to years, which in my eyes, are more important than adding years to life.

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