Regional Context, Market Transition, and Successful Aging: Results from Transitional China

by

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To my parents and my sister

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Abstract

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Recognizing the positive aspects of aging and exploring the ways older people age successfully has become an increasingly popular area of gerontology in recent years. Despite advances in successful aging research, there remain two important gaps in the current research literature: First, most studies have been limited to the US or other developed Western countries. Relatively little is known concerning the ways many older people experience successful aging in developing countries. Second, the existing studies overemphasize the role of the individual in successful aging and largely ignore the role that social factors play in successful aging. This study seeks to address the gaps by establishing a macro-micro linkage in the understanding of successful aging and investigates the ways in which large-scale social changes influence the likelihood that Chinese older people will age successfully – over and above individual-level characteristics.

I use individual-level data from 2000 Chinese Longitudinal Healthy Longevity Survey (CLHLS) and province-level data from administrative statistics to examine the effects of three dimensions of provincial-level market transition context – economic development, income inequality, and economic ownership restructuring – on individual successful aging in the transitional China. Two forms of market transition effects are examined: main effects of market transition context and interaction effects between market transition context and individual SES. Statistically, two-level random intercept logistic regression models are built for analyses

Findings reveal that objective measure successful aging is associated with both individual-level characteristics and province-level market transition characteristics including economic development, income inequality, and economic ownership restructuring; whereas subjective measure successful aging is only associated with individual-level characteristics. Moreover, the study finds that although economic development and economic ownership restructuring are positively associated with successful aging for all cases, the influences are not evenly distributed among groups: low SES older people benefit more from them than do high SES older adults.

This study has significant theoretical and policy implications. On the theoretical side, this study is an important addition to the literature on the gerontological implications of market transition. From a policy perspective, this study calls for greater attention to the effects of social context on individual aging experiences.

Chapter One

Introduction

Since the losses that accompany aging for most people are noticeable, research on older people generally expects an increase in the prevalence of older people who are dependent upon others for care, and, consequently, has largely focused on coping with decline (Uhlenberg, 1992). Partly in response to the negative age-stereotype and coping-oriented research theme, a recent call has been made to search for a "new gerontology" (Rowe & Kahn, 1998), meaning that it is incomplete to study aging without recognizing the positive aspects of aging. Echoing Weg's (1975) remarks, "individuals age at different rates…while it is useful to indicate the average decline of functions, it is equally important to keep in mind that any one individual may not fit that picture" (p.232). This growing body of literature supports the understanding that deterioration with age is not a uniform process across individuals, and argues that some individuals continue to function effectively, physically, mentally and socially, in old age (Rowe & Kahn, 1998; Freund & Riediger, 2003). Rowe and Kahn (1987, 1998), for example, distinguished two types of people who age: one type is "normal agers", which means those older people who have a constellation of age-related or lifestyle-dependent changes that convey risk of disease or dysfunction (Rowe & Kahn, 1998); and the other type is "successful agers". Rowe and Kahn (1998) further propose criteria for the classification of older adults as having experienced successful aging, which include: "low probability of disease and disease-

related disability, high cognitive and physical functional capacity, and active engagement with life" (Rowe & Kahn, 1998: 138).

Learning how older people age successfully will have a huge impact on not only older people themselves but also our society. Older people are predicted to be the fastest-growing group of many national populations (UN, 2001). One particularly relevant issue with population aging is the health status of older people. Older persons, on average, have more hospitalizations, more chronic diseases, and use increasing numbers of and more expensive types of drugs and therapies than other age groups (Johnson et al., 2005). The consequence of poor health lies in two parts. At the individual level, disease and disability affects individual's social roles, psychological well-being, and financial well-being (Curtin & Lubkin, 1995; Ohman, Soderberg, & Lundman, 2003; Schoenberg, Kim, Edwards, & Fleming, 2007). At the societal level, one major concern of the consequences of an expanding older population is the potentially huge healthcare burden (Schneider & Guralnik, 1990). Scholars, therefore, call for health promotion and disease prevention efforts in order to help with decreasing healthcare costs (Thorpe & Howard, 2006).

During the past decade, studies of aging focusing on functional decline and chronic disease have been complemented by studies identifying critical determinants of successful aging (Phelan et al., 2004). However, despite advances in successful aging research, there remain two important gaps in the research literature: First, although research on successful aging has been increasing rapidly recently, based on a review article by Depp and Jeste's (2006), most studies have been conducted in the US or other developed Western countries (e.g. Canada). However, it cannot be assumed that these

research results are universal, across contexts and countries. We understand far less about successful aging in developing countries.

Second, the existing studies overemphasize the role of the individual in successful aging and largely ignore the role that social factors play in successful aging (Riley, 1998; Estes & Mahakian, 2001; Holstein & Minkler, 2003). Estes and Mahakian (2001), for instance, point out, "social and environmental factors … remain underexplicated, undertheorized, and underresearched in the work on successful aging" (p.202). Frequently at the core of current research on successful aging is the notion of personal responsibility: for example, a proper diet and adequate physical activity (Depp & Jeste, 2006). The main message here is that successful aging is a result of the behaviors and individual characteristics of older people. As such, achieving successful aging is limited to a personal responsibility. Is lifestyle the only factor to blame for an unhealthy old age, or do social contexts make it harder to age successfully? The existing literature leaves the impact of social context on successful aging largely uninvestigated. This limitation would result in serious policy implications: with an individual-based explanation of successful aging, the society does not have to provide support for those who are not doing well at aging.

Bringing the environment or social context back into research has been gaining increasing attention in health-related fields. Researchers in public health have long suspected that health problems are the result of a complex interplay of influences operating at several levels, including the individual, the family, and the community (White & Fisher, 2003); and certain social and physical characteristics of residential neighborhoods make a difference to a person's well-being beyond the characteristics of

the individuals (Kawachi & Berkman, 2003). Based on the recognition that the experience of old age is both socially and biologically constructed, I would argue that it is incomplete to study successful aging as if individuals were in a vacuum with characteristics and traits predicting their attainment – and without taking social context into account.

This study, therefore, aims to bridge the gaps in our knowledge. In this study, I conduct an empirical study in an Asian society - China, and put successful aging into a social context –examining the impact of China's unique social context on individuals' successful aging.

China presents a unique opportunity to study successful aging determinants in the context of social, economic, and demographic change. During the past thirty years, China has been experiencing two transitions: demographic transition and market transition. China's demographic transition refers to rapid population aging. China has been well known as a rapidly "graying" country. The proportion of people over age 65 has been predicted to reach 20% of the population in 2025 and over 30 % of the population by 2050 (United Nations Population Division 2008). Moreover, the percentage of oldest old among the elderly population will nearly triple from 1990 to 2050 (Zeng & George, 2000). Although China is not the only country facing challenges associated with population aging, it is distinct insofar as it is a developing country – it will grow old before it becomes rich.

The "graying" of the population has numerous implications. The costs associated with the financing of an aging society are of particular concern. As the proportion of elderly people grows – especially the growing proportion of the oldest old – more

resources will be required to meet the demand for health care and other services. Relying on family support is a traditional and certainly an important way of dealing with problems associated with population aging. However, China's current one-child policy makes family care for older people increasingly difficult. Although the Chinese government has acknowledged the severe consequences of rapid population aging and weakening traditional family support, the public elder care system and high quality of the health care system are still limited and inadequate (Feng & Xiao, 2007). China's weakening traditional family support and its still-developing health care and public elder care system cause great concern about national capacity to meet age-based healthcare and service needs (Feng & Xiao, 2007). Therefore, promoting successful aging, as one of the best solutions to bridge the gap between the increasing need for health care among the older people and the limited health resources available (Young, Frick, & Phelan, 2008), has profound significance for China.

In addition to the demographic trends underscoring the importance of successful aging research, the massive market transition that is currently underway in China provides a rare opportunity for scholars to examine the effect of a large-scale social change on the well-being of individuals (Yu, 2008). China's market transition – the transition from state socialism to a market economy – has led to fundamental changes in its socioeconomic structures and individual life chances since 1978 (Zhou, 2004). When some are benefiting from the fast growth of the economy and gaining more opportunities, others are painfully paying the cost for the dramatic societal transition and even being marginalized (Whyte, 2010). A lasting debate among scholars concerns the process and consequences (e.g., winners and losers) of China's market transition. While this issue has

sparked lively debates in market transition literature, little attention has been paid to older people, who now constitute the fastest growing group in China. Have Chinese older people benefited from the market transition? Or, does market transition make it harder (or easier) to age successfully? These questions have been left unexamined.

Furthermore, studies on China's market transition lead us to expect the impact of transition on individuals might vary with the individual conditions. Tang and Parish (2000) point out that the transition to a market economy implies fundamental changes in the government's social contract with society. Changes to the social contract are always associated with the increasing feelings of uncertainty and instability and more psychological distress as people need to adapt to new rules and norms (Mirowsky & Ross, 2003). Although shifts in the social contract affects all Chinese residents, the degree of uncertainty faced by individuals is not equal: those whose personal conditions provide greater access to resources might cope well, while those whose personal conditions lead them to experience higher levels of instability may endure more distressed (Yu, 2008). This leads us to question whether the relations between market transition and successful aging would be moderated by the personal conditions of older people.

Taken together, the main research questions to be addressed in the study are as follows:

1. To what extent do individual level characteristics affect successful aging among Chinese older people?
2. To what extent do province level market transition characteristics affect successful aging among Chinese older people?

3. What are the interaction patterns between province level market transition characteristics and individual SES that affect successful aging?

To answer these research questions, this study specifies micro-level (individual-level), macro-level (province-level), and cross-level interaction (micro-level and macro-level) hypotheses.

Data from the 2000 wave of a national representative survey in China – Chinese Longitudinal Healthy Longevity Survey (CLHLS) is analyzed. CLHLS has a total sample size of 11,199 older adults from 22 provinces. The sample targets the oldest old group who averaged 91.3 years old in 2000. Using an oldest-old sample to understand the impacts of market transition on successful aging is especially important for practice and policy implication. We might expect that the oldest old group is among the most vulnerable to large scale social change due to worse physical and mental health, decreased mobility, and more limited access to resources (Haq, Whitelegg, & Kohler, 2008). They may be more likely to face adaptive challenges to new environments that social change brings. Understanding how social change affects vulnerable older populations is an important first step before we can take proper actions to reduce vulnerability.

By answering the research questions, this study makes contributions to both gerontology literature and market transition literature. First, this study enriches the literature on successful aging by applying the Western-developed concept in a very different Asian social context – contemporary China. I found that some factors identified in Western literature influence successful aging in the same way among the Chinese older people. For example, pro-health behavior is positively associated with successful aging;

risky behaviors such as smoking and drinking are negatively associated with successful aging. Social support shows a consistently positive association with successful aging. However, the results also reveal that SES works differently in this study, with cadres or managers (higher SES people) being less likely to age successfully based on the objective criteria than non-agricultural workers (lower SES people). I argue that the inconsistency between this finding and previous studies on higher SES equating to better health may be attributed to the unique life experiences of this group of Chinese older adults.

Second, this dissertation highlights the role of market transition in shaping successful aging. The results show that objective successful aging is influenced by both individual-level characteristics and province-level market transition characteristics including economic development, income inequality, and economic ownership restructuring. By adding macro-level social context into successful aging research, it improves the understanding of the way in which an individual's social context plays a role in his or her aging experience, over and above individual-level predictors.

Third, this study is an important addition to the literature on the gerontological implication of market transition. China's transformation from a planned economy to market economy has captivated the attention of many studies in recent years. I enrich the market transition literature by focusing a group of older people, a rapidly growing group largely neglected in exiting studies. My work also moves the current literature on market transition debate into a new direction by focusing on non-material well-being (i.e. successful aging). Most existing studies examine individuals' economic well-being: income, mobility in the labor market, and housing (Lin & Bian, 1991; Xie & Hannum, 1996; Walder et. al. 2000; Zhou 2000; Wu & Treiman, 2004; Wu & Xie 2003). However,

individual's non-economic well-being, such as health outcomes and psychological well-being, has been neglected in research. In addition, I join the debate about who are the beneficiaries of the market transition by providing new evidence that low SES older people actually benefit more than high SES older people from China's market transition. I argue that market transition serves as a positive turning point for low SES older people. Diverging personal experiences under a planned economy and since may explain why they benefitted most from market transition.

Fourth, my study also adds new evidence to the comparative study of market transition in post-socialism countries. Empirical studies on Eastern Europe and the former Soviet Union generally document the negative impacts of market transition on their citizens, including sharp increases in mortality, mass psychological stress, and dramatic deteriorations in the quality of people's lives. The results of this study, however, tell a different story. I found that China's market transitional has generally provided a positive environment for its senior citizens, which makes successful aging more likely. I argue that the positive impact of market transition found in China may largely due to China's unique market transition pathway, which is quite different from the transitions experienced by Russia and Eastern Europe.

Finally, the findings from this study may potentially guide practitioners and policymakers in developing effective programs and policies to move towards the goal of achieving successful aging. It may also yield insights for other developing countries that are undergoing similar changes.

Following this introduction, I review existing successful aging literature as well as market transition literature, and discuss in detail the variables that influence successful

aging. Hypotheses are proposed from the literature review. In Chapter three, I discuss the data source, measurements of variables, and analytic strategies used to test hypotheses. I present the empirical results in Chapter four. Chapter five offers a detail discussion of the results. I conclude the dissertation by discussing study limitations and its implications for policy and social work.

Chapter Two

Literature Review and Research Hypotheses

This chapter provides a review of the literature on successful aging and market transition in China. I first begin by describing the concept of successful aging. Next, an overview of the association between individual-level characteristics and successful aging is described. I then present literature related to market transition and successful aging. I touch on topics of economic development, income inequality, and economic ownership restructuring. After that, I discuss the interaction effects of individual SES and market transition context on successful aging. Lastly, I summarize the research hypotheses.

2.1. Successful Aging

Successful aging is a concept in social gerontology that has captured increasing interest of many researchers in recent years (Rowe & Kahn, 1998; Phelan & Larson, 2002; Freund & Riediger, 2003; Depp & Jeste, 2006). However, no one agrees on the best way to define or measure this concept (Tate, Lah, & Cuddy, 2003). After reviewing nearly 200 articles that discuss successful aging, Depp and Jeste (2006) pointed out that the definition of "successful aging" varies markedly across studies.

2.1.1. An Overview of Rowe and Kahn's Definition

One of the most comprehensive definitions is Rowe and Kahn's (1998) definition. This definition entails multiple objective criteria. Specifically, it includes three key

characteristics: (1) Low risk of disease and disease-related disability, (2) high cognitive and physical functions and (3) active engagement with life (p. 38).

(1) Low risk of disease and disease-related disability: The reason why avoidance of disease and disease-rated disability are important to shape a good old age lies in two parts. First, diseases increase the risk of death. Some chronic diseases, e.g. heart disease, cancer, cerebrovascular disease, and chronic lung disease have been identified as the main cause of death for older people (US Census Bureau, 2005). Second, disease is a risk factor for disability and its associated outcomes such as institutionalization (Ostir et al., 1999), the likelihood of developing other chronic disease (Friedewald et al., 2006) and dementia (Qiu et al., 2007). According to Rowe and Kahn's (1998) concept, avoiding disease serves as a foundation for achieving successful aging. They note that "the absence of disease and disability makes it easier to maintain mental and physical function," and further maintaining "mental and physical function in turn enables (but does not guarantee) active engagement with life" (pp.39).

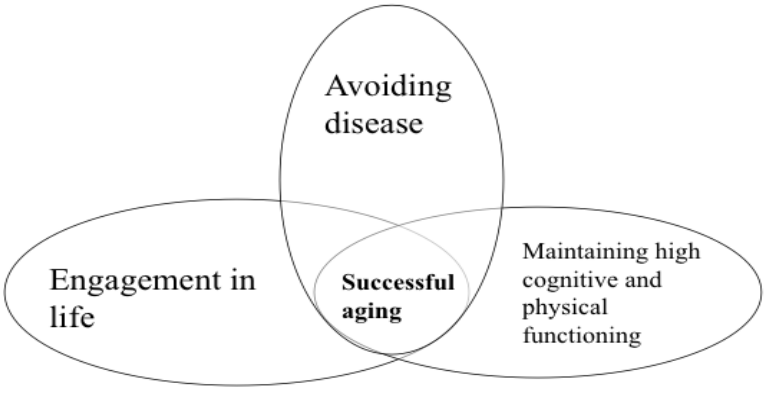
(2) High cognitive and physical functions: Rowe and Kahn (1998) note that the failure of maintaining physical and cognitive functioning may threaten the principal goal of remaining independent for many elders. Empirically, Depp and Jeste's (2006) review article on successful aging shows that physical functioning has been the most frequently appearing component of successful aging definitions in existing studies. Some argue that physical and cognitive functionality is the most important component of the concept of successful aging, because the absence of either one would have serious implications for independent living (Berkman et al., 1992) and would lead to adverse health outcomes,

such as institutionalization (Guralnik et al., 1994, Banaszak-Holl et al., 2004) and an increased risk of death (Feil et al., 2003).

(3) Active engagement with life: Rowe and Kahn's "active engagement" term includes two subcomponents – having and maintaining interpersonal relations and productive activity. Specifically, interpersonal relations mean "contacts and transactions with others, exchange of information, emotional support, and direct assistance" (pp.46-47); productive activity refers to paid or non-paid activities that create societal value. Several studies show that the ability to remain engaged in life appears to be an important aspect of aging well (Herzog et al. 2002): older people show several positive outcomes including a reduced risk of disability or depression through involving activities such as employment, volunteer work, socializing, and caregiving.

Figure 2.1 shows three components of successful aging. One point should be noted here: Rowe and Kahn emphasize that successful aging is the *combination* of all three – avoidance of disease and disability, maintenance of cognitive and physical function, and sustained engagement with life.

Figure 2.1: Components of Successful Aging



Source: Rowe & Kahn (1998) pp.39

2.1.2. Criticism of Rowe and Kahn's Definition

There has been considerable debate on the topic of successful aging since Rowe and Kahn first introduced their concept (e.g. Riley, 1998; Estes & Mahakian, 2001; Masoro, 2001; Moody, 2001; Taylor & Bengtson, 2001; Kahn, 2002; Strawbridge et al., 2002; Glass, 2003; Holstein & Minkler, 2003; Kahn, 2003). The biggest criticism of Rowe and Kahn's definition of successful aging is that their definition is too strict and thus could underestimate the proportion of older people who are actually experiencing successful aging. Many scholars indicate that Rowe and Kahn's concept of successful aging, which is a researcher-developed concept, may not be consistent with the way that how older adults themselves conceptualize successful aging (Scheidt et al., 1999; Taylor & Bengtson, 2001; Phelan & Larson, 2002; Holstein & Minkler, 2003; Glass, 2003). When Strawbridge et al,'s (2002) study compared the proportions of successful agers by using Rowe and Kahn's criteria and older adults' own perceptions, they found considerable difference between them. By asking participants "how strongly they agreed or disagreed with the statement 'I am aging successfully (or aging well)'?" (p.728), more than half of participants (53.3%) felt they were aging successfully. The proportion of individuals who met Rowe and Kahn's criteria, however, was only 18.8%. Moreover, about 37% of those who met Rowe and Kahn's definition did not feel that they were aging successfully.

Other studies further show that researchers and older adults may value different factors in terms of conceptualizing successful aging. For example, Phelan et al. (2004) examined whether older adults value the same factors in terms of successful aging as

researchers do. The findings showed that over 90% of older people rated "remaining free of chronic disease," "remaining in good health," "being able to take care of myself until close to the time of my death" (p.213) as important factors. Such findings are consistent with Rowe and Kahn's notion of avoidance of disease and disability. Although participants also rated "being able to work in paid or volunteer activities after usual retirement age" as important, the actual proportion of supporters was less than 50.2%. This finding that shows that Rowe and Kahn's notion of "being actively engaged in life" does not carry the same weight in older people's value systems. In addition, over 80% of the participants rated "being able to cope with the challenges of my later years" and "being able to act according to my own inner standards and values" (p.211) as important. This factors are not emphasized in Rowe and Kahn's definition. Reichstadt et al.'s (2007) study also show that Rowe and Kahn's definition captures several key factors that older adults value most, such as good health, being embedded in social relationships, and "staying engaged and remaining active" (p.198). However, other factors, such as being able to "adapt to change," having a "positive attitude," and "economic security" (p.197), have been missing in Rowe and Kahn's framework.

However, scholars further indicate that subjective evaluation of successful aging has its own weakness, that is, it may lead to an overestimation of the proportion of people experiencing successful aging. As Baltes and Smith (2003) argue, "the older people get, the greater is the discrepancy between subjective evaluations of their health and the objective medical status" because individuals attempt to "compare themselves with others who have similar or even worse illnesses" (p.127) as a strategy of coping with disease, or as Stewart (1989) and George (2001) indicate, as a means of protecting self-image. On

the other hand, despite the criticism of Rowe and Kahn's framework, scholars admit that their objective criteria have merit. Phelan et al.'s (2004) study and Reichstadt et al.'s (2007) study show that the core components of Rowe and Kahn's definition overlap with factors identified by older people as important, such as the avoidance of disease and disability and staying engaged and remaining active. Moreover, Rowe and Kahn's definition is useful to quantify successful aging.

2.2. Effects of Individual Characteristics on Successful Aging

Since the concept of successful aging was introduced, there is a growing body of literature examining predictors of successful aging. Existing research has predominantly focused on individual-level predictors of successful aging. I identify three groups of individual-level factors that are frequently examined by the existing empirical studies: (1) socio-demographic characteristics, (2) health-related behavioral determinants, and (3) social support.

(1) socio-demographic characteristics

Relatively younger age has been reported to be associated with successful aging. Depp and Jeste (2006) summarized that younger age is the most consistent predictor of successful aging across studies. Strawbridge et al. (2002) found that the percentage of older adults meeting Rowe and Kahn's definition declined with advancing age, with 25% of those ages 65 to 69, 18.5% of those 70 to 79 years of age, and 11.6% of those aged 80 to 99 years. Similarly, using four waves (1998, 2000, 2002, and 2004) of Health and Retirement Study (HRS) datasets, McLaughlin et al. (2010) found no greater than 2.2%

of the oldest-old (85+) were classified as aging successfully in any year, whereas the percentage among the young-old (65-74) ranged from 15.7% to 16.8%.

Gender differences also exist across multiple dimensions of successful aging, but research shows mix results. In the physical health domain, research shows women experience more physical limitations and more disability than men (Schoenborn et al., 2006; Newman & Brach, 2001). In the social engagement domain, several scholars documented that women were more likely than men to do voluntary work (Tang, 2006; Lum & Lightfoot, 2005), while other researchers found that men actually volunteered more than women (Cutler, Hendricks, 2000; Musick, Herzog & House, 1999). Also, Strawbridge et al. (2002) found a higher percentage of women than men in the Alameda County Study using Rowe and Kahn's definition of successful aging.

Socioeconomic status (SES) is another important predictor. Numerous studies show, people with higher SES are more likely to report better health, better mental health outcomes, greater levels of physical functioning and mobility, and low rates of disability and mortality (Adler & Ostrove, 1999; Crimmins, Hayward, & Seeman, 2004). However, when put in the context of aging, this seemingly universal relation between SES and health becomes uncertain.

There are two primary arguments of age patterns in the relationship between SES and health: the cumulative advantage argument (Dannefer, 2003) and the convergence argument (House et al. 1994). The cumulative advantage argument predicts that the effect of SES grows larger with age. In contrast, the convergence argument asserts that the effect of SES is small on health in early adulthood, expands in middle age, and then narrows in old age (House et al. 1994). It predicts that the relationship between SES and

health at very old ages is minimal or even nonexistent (Zhu & Xie, 2007).

Empirical studies support both arguments. Ross and Wu's (1996) study offers evidence of the cumulative advantage hypothesis, they argue "educational attainment increases resources that accumulate throughout life, producing a larger SES gap in health among older persons than younger (p. 105)." Franks et al. (2003) also report that better educational attainment is associated with a lower level of mortality, better self-reported health, and a higher level of physical functioning. McLaughlin et al. (2010) found the percentage of adults aging successfully increased markedly with increasing levels of education: for example, the prevalence of successful aging was 2.5% of those with less than a high school education, and 20.5% for those with a college or higher education. Ross and Wu (1995) offered three mechanisms to explain the links between education and health: economic conditions, psychological resources, and health-promoting behaviors. People with higher educational attainment are more likely to be employed, to work full-time and have higher income than their poorly educated peers. Therefore, they are less likely to experience economic hardship that could result in poor health. Also, people with poor education have a lower sense of control over their lives and have less social support, which are regarded as important health-enhancing resources. In addition, a health-promoting life style is more popular among the well-educated people (Ross & Wu, 1995). Other studies using occupation as the measure of SES also support cumulative advantage argument. Breeze et al. (2001) compared men in clerical or manual (low-grade) jobs in middle age with senior administrators and found that they had quadrupled the odds of poor physical performance in old age, tripled the odds of poor general health, and doubled the odds of poor mental health and disability. One study on Chinese older

adults aged 80 and above showed that non-agricultural professionals and homemakers reported significantly better self-rated health compared to agricultural workers (Zeng et al., 2002).

However, other studies suggest that the effect of SES on health and mortality is smaller for the elderly than for adults (persons aged 25-64 years) (Backlund, Sorlie, & Johnson 1996; House et al., 1990 &1994; Huisman, Kunst, & Mackenbach 2003). House et al. (1990, 1994) offer several explanations of this age pattern of convergence. They argue that with age, biological determinants may become more important in determining health, and gradually dominating social factors in affecting mortality for the oldest old. Second, there might be a selective bias. The diminished or nonexistent SES differentials in older ages may reflect the fact that less healthy people have died before reaching a certain age. In other words, those who survive to very old ages are already selected with respect to unobserved health traits that should compensate for SES effects. Third, they also argue that in developed countries such as the United States, social welfare policies reduce SES inequalities among the elderly.

(2) Behavioral determinants:

Burke et al.'s (2001) longitudinal study looked at the factors associated with remaining healthy in adults who are 65 years old or older. Their study showed that some behavioral factors such as physical activity and quitting smoking, were significant predictors of continued health.

A large literature discusses the behavioral determinants of healthy aging. Smoking status, alcohol consumption, and physical activity are frequently examined (Depp & Jeste, 2006). World Health Organization's (WHO, 2002) aging report indicates

that smoking is a risk factor for all older people and a major preventable cause of premature death. Being a current nonsmoker was associated with healthy aging, and a lower consumption rate was also predictive of healthy aging (Peel et al., 2005). Likewise, Depp and Jeste (2006) found strong evidence of a relationship between successful aging and avoidance of smoking. Studies on alcohol consumption and healthy aging yielded mixed results. One study found moderate/some alcohol consumption compared with abstention was beneficial for healthy aging (Guralnik, et al., 1989), but other studies did not find the same pattern (Reed et al., 1998; Strawbridge et al., 1996). Physical activity has been identified as a strong predictor. WHO (2002) points out participation in regular physical activity can delay functional declines and reduce the onset of chronic disease in both healthy and chronically ill older people. And there is a general consensus in the existing literatures that high levels (based on the frequency of participation) of physical activity were associated with healthy aging (Peel et al., 2005).

(3) Social support:

While social support has gained popularity in public health and sociological research, there is no general consensus on how social support should be specifically defined (Cohen & Syme, 1985; House et al., 1988; Schroevers et al., 2003). Generally speaking, social support refers to resources available from one's network (Antonucci, 1985; House & Kahn, 1985). Social support is a multi-faceted concept consisting of several distinguished theoretical constructs (Dean & Lin, 1977; Hirsh, 1980; Funch & Mettlin, 1982). Barerra (1986) proposes that social support can be conceptualized in three ways: social embeddedness, received support, and perceived support. Social embeddedness refers to the connections that individuals have with their significant others

and their social environment. Received support refers to the actual transfer of help provided by an individual's social network members. Perceived support refers to the subjective evaluations of resource availability and adequacy in the case of need.

Rowe and Kahn (1998) argue that social support is a key determinant of successful aging. Previous studies have documented that individuals reporting higher levels of social support tend to have lower mortality rates (Dalgrad & Haheim, 1998; House, Landis et al., 1988; Rogers, 1996; Seeman et al., 1993), improved physical functionality (Bosworth & Schaie, 1997), decreased risk for mental disorder (Cohen & Syme, 1985; Krause, 1997; Veiel & Baumann, 1992), and better overall health (Seeman, 1996; Ren et al., 1999; Zunzunegui et al., 2004). In contrast, people perceiving a lack of social support from their social ties tend to experience higher depression or unhappiness, which decreases overall well-being (Krause, 1987; Turner, 1983; Diener & Seligman, 2002; Min et al., 2005).

There are two hypotheses formulated to address how social support impacts health: the stress-buffering hypothesis (Cohen & Wills, 1985) and the direct effect hypothesis (Jemmott & Locke, 1984; Kielcolt-Glaser & Glaser, 1995; Cohen, Tyrrell, & Smith, 1991, Seeman et al, 2004). The stress-buffering hypothesis assumes that the impact of social support on health is a buffering process by which the social support mediates the deleterious impact of stress (Cohen & Wills, 1985). Two particular pathways have been suggested by the buffering hypothesis. First, social support prevents people from perceiving stress, or reduces the detrimental effects of stressful events (Cohen & Wills, 1985; Lepore et al., 1993); Second, social support may eliminate sources of stress such as stressful life events, or impact the physiological process or

illness behaviors (Cohen & Syme, 1985; Cohen & Wills, 1985). The direct effect hypothesis argues that the perception of potential help from others elevates one's self-esteem and a sense of control over the environment. These beliefs are believed to directly affect the individual's ability to adapt or cope to the effects of stress on their physical or psychological well-being (Seeman et al., 2004). Another body of direct effect research focuses on the impact of stressors on the immune system and the resulting link between these immune system changes and disease susceptibility and progression (Kielcolt-Glaser & Glaser, 1995; Cohen, Tyrrell, & Smith, 1991). This area of research proposes that a strong support system may help reduce the influences of stress on immune functioning, thus resulting in improved health outcomes or longer survival.

When considering elderly populations, several studies reported that family-based social relationships have a greater effect on enhancing well-being than non-family relationships among older populations: interactions with family members led to a higher level of life satisfaction and a greater sense of well-being (Felton & Berry, 1992; Lang & Carstensen, 1994; Takahashi et al., 1997).

Living arrangements are often regarded as a proxy of actual support provision in previous research, based on the assumption that people are more likely to receive support from co-resident members (Shanas, 1979). This assumption is particularly true in China, where filial piety and a strong sense of familism are still dominant. As a Chinese proverb says, "Rearing a son for old-age is like storing away grain against famine," parents raise children in anticipation of reciprocal support from children when they get old. This normative responsibility towards parents can be translated into actual support in co-residential living. Even if the Chinese older people are healthy and free of financial

concern, they may be likely to live with their children for emotional intimacy. Therefore, co-residence and the close proximity of children represent the intensity of intergenerational interaction and the volume of support that older parents can require. Even though living arrangements may not be directly translated into care provision, as some researchers argue (e.g. Chi & Chou, 2001; Sun, 2004), the perception of support per se is likely to have a beneficial effect on psychological well-being of older parents.

2.3. Effects of Market Transition Context on Successful Aging

Many scholars indicate that current successful aging research overemphasize the role of the individual in successful aging and ignores the role that macro societal factors play in successful aging (Riley, 1998; Estes & Mahakian, 2001; Taylor & Bengtson, 2001; Holstein & Minkler, 2003). Riley (1998) notes that research "fails to develop adequately the social structural opportunities necessary for realizing success" (p.151). In the same vein, Estes and Mahakian (2001) indicate, "social and environmental factors remain underexplicated, undertheorized, and underresearched in the work on successful aging" (p.202). Kahn (2003) admits that these criticisms are "both accurate and constructive" (p.61).

Individuals, as social ecological theories suggest, are nested in multilevel of social context, including the microsystem that is composed of their individual agency, family members, friends and peers, and the macrosystem that is composed of the broader social context (Bronfenbrenner, 1979 &1995). Characteristics of individuals within the microsystem and broader social context of the macrosystem affect how individuals within these systems respond to events (Bronfenbrenner, 1979 &1995). Therefore, when looking

at individual health outcome, one must take into account, not only the individual, but also the broader social context he or she is in (Bronfenbrenner, 1979 &1995, McLeroy, Bibeau, Steckler, & Glanz, 1988). Guided by this suggestion, this study extends the factors of concern in terms of successful aging from the microsystem (individual) to the macrosystem (broader social context). Although existing literature somewhat neglects the relationship between broader social contexts and successful aging, some work in Sociology and public health sheds light on the rationale of studying the link between large-scale social contexts and individual well-being. For example, Durkheim ([1897] 1951) studies the influence of social context on individual behavior and found that social forces external to the individual influenced suicide. Several studies on the health situation in Eastern Europe and the former Soviet Union reveal that their market reforms resulted in a deterioration in the health of their citizens (Brainerd, & Cutler, 2005; Ellman, 1994; Field, 1995; Cornia & Paniccia, 2000; Watson, 1995). Inspired by these studies, I extend the literature on successful aging in China by exploring how China's unique social context – market transition –influences individuals' chances to age successfully.

China has been experiencing a large-scale market transition since 1978. Market transition represents a very unique social process that socialist countries experience when they shift from state-controlled to market-based economies (Nee, 1989; Firebaugh & Sandu, 1998). China's market transition has brought remarkable changes in many respects. On the bright side, there has been rapid economic growth, the rising of overall income levels, and active engagement in the world economy (Naughton, 2007). On the dark side, there has been rising income inequality, mass layoffs, socialism-style benefit cuts, and firm closures (Naughton, 2007). During this process, some groups and

individuals are rewarded by the competition and prosper from the new opportunities, while others are much less sheltered from competition than in the past fare less well. How does market transition influence older people in terms of their physical health, psychological health, or overall well-being? Does market transition make it easier for older people to age successfully, or does it make it harder? These are the main concerns of this study. In this section, I suggest some mechanisms that may link China's market transition to successful aging. Since no studies examining the effect of market transition on successful aging are available, here I rely on the market transition and general health literature.

A large body of research on reform-era China documents that China's market transition has been accompanied by three notable phenomena – (1) rapid economic growth (Lau et al., 2000; Bramall, 2001), (2) increasing income inequality (Milanovic, 1998; Zhou, 2000; Wu & Treiman, 2004; Park et al., 2003), and (3) economic ownership restructuring (Naughton, 2007; Yusuf et al., 2006). Each of these profound socioeconomic changes has potential influence on older people's age outcomes.

2.3.1. Rapid Economic Growth

There are two theories to explain how economic growth/development exerts an effect on individual well-being: the absolute utility theory (Veenhoven, 1988, 1991) and the relative preference theory (Easterlin, 1974).

The absolute utility theory (Veenhoven, 1988, 1991) states that wealth helps individuals meet certain universal needs such as nutrition, comfortable housing and health care, and self-actualizing needs; thus, wealth is a cause of individual well-being. Indeed, in the public health literature, it is commonly believed that income affects health

through better nutrition and access to improved health services, both of which are crucial to maintain good health (Preston, 1975; Flegg, 1982), which are also summarized in a famous phrase "wealthier is healthier" (Pritchett & Summers, 1996). Empirical studies have confirmed that rich countries had a higher overall status of health than poor countries (Preston, 1975, Rodgers, 1979; Wilkinson, 1992; Pritchet & Summers, 1996; Goesling & Firebaugh, 2004; Brady, Kaya & Beckfield 2007). Pritchett and Summers (1996) interpret the links between "wealth" and "health" most likely through increased public and private spending on goods that directly or indirectly improve health. Zimmer et al. (2007) argue that rising income positively effects health also through increased educational attainment and health knowledge – factors which further enhances healthy behaviors.

China's market transition has been accompanied by enormous economic growth for the last three decades. Since 1978, China has experienced unprecedented economic growth at an average annual rate of 9.3% (Chinese Academy of Social Sciences, 2005). In terms of the health realm, the aggregate national health outcomes have improved steadily over the past few decades, with life expectancy at birth increasing by 2.6 years for men and 3.0 years for women between 1990 and 2001 (Lopez et al., 2006). Whyte and Sun (2010) also indicate that China did not experience the deterioration in citizen health and life expectancy that occurred in Russia and other Eastern European post-socialist countries during the reform era. They argue that the reason why China avoided the negative health trends found in other post-socialist societies is because "China has experienced a sustained economic boom" (p.7), which is accompanied by substantial improvements in average living standards and health-related facilities and conditions. As

they write: “as communities that were once isolated and lacked electricity and running water become richer and obtain these, as well as better housing and sanitation facilities and telephone and electronic media connections to the outside world, local health conditions improve.” (p.7-8).

The relative preference theory (Easterlin, 1974) argues that the impact of wealth on individual well-being depends on changeable standards such as adaptation, expectations, and social comparisons. In other words, the impact of wealth on individual well-being is relative to the individual’s own previous wealth level or relative to other people. Some empirical studies also discuss the consequence of China’s economic growth in the psychological well-being realm. For example, Tang and Parish (2000) report a positive association between aggregate-level economic growth and optimistic attitude towards one’s own mobility chances, after controlling for their actual economic status and other individual-level characteristics. Similarly, Yu (2008) argues that aggregate-level economic growth also improves residents’ mental health by “enhancing their levels of optimism towards their economic future” (p349).

In short, economic growth may have a positive effect on individual well-being either through the direct way by providing adequate nutrition, housing and health care that are crucial to maintaining good health, or through the indirect way by providing the optimistic expectations of getting ahead that contribute to psychological well-being.

2.3.2. Increasing Income Inequality

Economic success, however, is not the only consequence of market transition. Important changes in social inequalities, such as dramatic increases in income inequality, are found under marketization in the former Soviet Union and Eastern European

countries (Rangelova, 2003). Under the socialist system, the state controlled assets, set the prices, compressed wages and salaries, provided comprehensive social services for the people; as a result, socialist societies were fairly egalitarian (Atkinson & Micklewright, 1992). However, the transition from a centrally planned economy to a market economy completely changed this situation. The resulting dramatic increase in income inequality has been one of the most important characteristics of the market transition (Alam et al. 2005; Heyns 2005). China, as a transitional society, has experienced the same problem. Although precise data is lacking, the consensus is that macro-level inequality has increased significantly following the implementation of economic reforms. Using the World Income Inequality Database (WIID), for example, Feng and Yu (2006) report that the Gini coefficient increased from 0.24 to 0.45 from 1984 to 2004. These numbers are significantly higher than the levels (between 0.16 and 0.19) observed for the years before the economic reform (Adelman and Sunding, 1988).

The impact of income inequality on individuals' well-being is mostly discussed in health economics and public health literature. The early argument on the effect of income inequality on health tends to treat it as the by-product of the relationship between income and health. Preston (1975) and Rodgers (1979) found not only the positive relationship between income and health, but more importantly, they found the positive relationship is concave. This suggests that income has a larger effect on the health of the poor than the rich. Preston (1975) further argued that this concave relationship implied that a redistribution of income from rich to poor within countries or across countries might result in an improvement in health status of the poor by more than the reduction in health

experienced by the rich. This, in turn, might lead to an overall increase in the average health status of the population.

Other scholars have gone further and proved that income inequality may have a direct hazardous effect on health. Wilkinson's (1992) study on 23 OECD countries shows it is the most egalitarian societies rather than the richest ones that have the best health. In his series of publications (Wilkinson, 1992, 1996, 1997, 2005 & 2006), Wilkinson asserts that income inequality has a genuine, harmful effect on population health. He suggested that even among people with sufficient personal resources, living in a place with high income inequality can be damaging to health. Wilkinson's argument is also known as the "income inequality hypothesis". Many empirical studies have confirmed Wilkinson's income inequality hypothesis. For example, Waldman (1992) finds a positive relationship between the share of income of the richest 5 percent of a country's population and the country's infant mortality rate – even after controlling for other factors such as the real incomes of the poor, access to health care, urbanization, female literacy rate, and gross reproductive rate. Kennedy et al. (1998) analyze data from the Behavioral Risk Factor Surveillance System to examine the relationship between state-level income inequality (measured by Gini index) and self-rated poor or fair health. Their results show that individuals living in states with the largest income inequality are 30 percent more likely to report poor or fair health than those living in the least unequal state. Other cross-country studies find the similar results. For example, De Vogli et al., (2005) report a negative relationship between income inequality (measured by the Gini index) and life expectancy at birth among the 21 richest countries, after weighting by population size and adjusting for GDP per capita. Using data from the 1994-2001 European Community

Household Survey, Hildebrand and Van Kerm (2005) find that there is a statistically significant association between income inequality and self-rated poor health after adjusting for individual sociodemographic covariates, income, and "welfare state" regimes. Using the same dataset but employing different analysis strategy, Etienne et al. (2007) report similar conclusions and show that the effect of income inequality on self-reported general health is robust to various measure of income inequality. Trosheim et al. (2006) conduct a study on adolescents from 27 European and North American countries based on the data from WHO Collaborative Health Behavior in School Aged Child Study and report that adolescents from more unequal societies are more likely to report poor health, even after adjusting for measures of family wealth and social resources.

The potential pathways through which income inequality can affect individual health include (Kawachi and Kennedy, 1999) (1) erosion of social capital, (2) psychological stress, and (3) disinvestment in human capital.

(1) Income inequality and the erosion of social capital: Wilkinson (2000) shows that death rates may be two to four times as high among those who are poorly socially integrated as compared to those with more friends, more social support, or more community involvement. They argue that the major mechanism through which income inequality affects health is through its impact on the quality of the social environment. Deaton (2003) writes, " equality is seen as a precondition for the existence of a stress reducing network of friends, while inequality and relative deprivation are seen as compromising individual dignity and promoting shame and violence." Marmot and Wilkinson (2001) claim that greater inequality increases the burden of low social status

while weakening social affiliations. There is also a "culture of inequality", which is "more aggressive, less connected, more violent and less trusting" (p. 1235).

(2) Income inequality and psychological stress: income inequality may lead to ill health via psychological stress. Wilkinson (1992, 1996) has argued that income inequality affects people's perceptions of place in the social hierarchy based on relative position according to income, which plays a direct role in creating stress and has a harmful effect on individual health. Deaton (2001) argues that psychological stress may increase the probability of contracting a disease or increase the tendency to be involved in risky, health compromising behavior. His empirical study shows that men with higher relative deprivation are more likely to self-report poor health, have high blood pressure or disabilities and have a host of poor health habits including smoking, not wearing safety belts, high body mass index and not exercising.

(3) Income inequality and disinvestment in human capital: Sen (1999) and Deaton (2003) suggest that income inequality may lead to inequality in political power and further has a detrimental effect on the health of the poor through unfair public policies. Kawachi and Kennedy (1999) and Lynch et al. (2000) argue that income inequality can affect population health through material pathways associated with social disinvestment. Specifically, Lynch et al. (2000) note inequalities in health resulting from the differential accumulation of exposures and experiences in life. The effect of income inequality on health reflects "a combination of negative exposures and lack of resources held by individuals, along with systematic underinvestment across a wide range of human, physical, health, and social infrastructure (pp.1202)". Kaplan et al. (1996) have demonstrated that states with high income inequality spent a smaller proportion of the

state budget on education and showed poorer educational outcomes. One reason why high income disparity may translate into lower social spending, as Kawachi and Kennedy (1999) argued, is that a greater income gap leads to greater disparity in interests between the rich and the rest. Quoting Krugmen's (1996) argument for further explanation, they write, "As Paul Krugmen put it: 'A family at the 95th percentile pays a lot more in taxes than a family at the 50th, but it does not receive a correspondingly higher benefit from public services, such as education. The greater the income gap, the greater the disparity in interests. This translates, because of the clout of the elite, into a constant pressure for lower taxes and reduced public services' (Krugman, 1996:48)" (Kawachi & Kennedy, 1999: 221). Therefore, large income inequality generates large disparity in social interests, which leads to less social spending. And less social spending in human capital such as education may diminish life opportunities for the poor, which further negatively affects their overall well-being.

In short, there is abundant evidence to support Wilkinson's income inequality hypothesis that income inequality has a genuine harmful effect on population health.

2.3.3. Economic Ownership Restructuring

In addition to the aforementioned factors, evidence of market transition is seen in economic ownership restructuring which includes the decline of the state-owned economy and the rapid development of the non-state-owned economy. The state-owned economy was central under the planned economy. They were under the direct control and full protection of the state. In pre-reform days, China's industrial enterprises consisted virtually exclusively of state-owned enterprises and collective-owned enterprises (Naughton, 2007). With the introduction of the market system and the development of

non-state economy, the state-owned economy lost its dominant role in the national economy. State ownership in China has been diluted at a rapid speed and on a massive scale since the late 1990s (Lau, 2000). By the end of 2003, 85% percent of small and medium industrial state-owned enterprises (SOEs) supervised by local governments had been restructured (OECD, 2005). In some localities, about 90% of small and medium public enterprises were restructured in a single year (Steinfeld, 1998). Over 30 million workers were laid off during the period from 1998 to 2005 (OECD, 2005).

Economic ownership restructuring is central to a transition from a planned to a market economy. State-owned enterprises restructuring involves fundamental changes in the government's social contract with society (Tang & Parish, 2000). The socialist social contract existed between the communist state and workers. Under this contract, the state promised "an egalitarian, redistributionist order that provided job security, basic living standards, and special opportunities for those from disadvantaged backgrounds. In return, the state demanded sacrifices in current consumption, a leveling of individual aspirations, and obedience to the all-knowing party redistributors." (Tang & Parish, 2000:3). Indeed, before the reform, urban Chinese residents were entitled to lifetime employment, relatively egalitarian wages, housing, food, pension, medical care and insurance, and other social services through their work units that were directly or indirectly controlled by the state. By introducing a market-based system, the state no longer promises job security, basic living standards, and an egalitarian distribution of resources (Yu, 2008). The changing social contract in China thus brings a new social order and the reduction of the social safety net in the reform era. How does this process affect individual well-being? Since research on these issues in the Chinese context is lacking, here I largely

draw from the studies on Eastern Europe and the former Soviet Union – who also experienced the massive economic ownership restructuring during their transitions from planned economies to market economies – to seek the link between economic restructuring and individual well-being.

Empirical studies on Eastern Europe and the former Soviet Union generally document the negative effect on individual well-being. People there have suffered downward mobility and growing feelings of insecurity about their life during economic transformation (Kluegel et al., 1999). King et al. (2009) indicated that the rapid and large-scale privatization of firms and property were associated with increased anxiety and stress that had a negative impact on life expectancy in Eastern European transition societies. These countries generally experienced a health crisis during their transition years. In Russia, both male and female life expectancy at birth fell substantially during the early years of transition, with male life expectancy at birth falling by over six years (Brainerd & Cutler, 2005). Suicide rates rose dramatically in the early years of transition: by 1994, the suicide rate for middle-aged Russian men was over six times higher than that in the US (Brainerd & Cutler, 2005). The mortality crisis also is found in other former Soviet Union countries. Becker and Urzhumova (2005) examine changes in mortality at a disaggregated level in Kazakhstan in the 1990s and find that the pattern in the early 1990s was similar to Russia with a sharp increase in mortality between 1990 and 1995. Krumins (2001) uses disaggregated data from national life-tables to examine changes in mortality in Latvia in the early 1990s. Again, the pattern is much the same as in Russia with a sharp increase in mortality between 1991 and 1994. In terms of other indicators, Gilmore et al. (2002) examines self-reported health status in survey data for

Ukraine in 2000. The self-reported health of Ukrainians is particularly poor. 25% of men and 43% of women report their health as either poor or very poor.

A number of arguments have been proposed to explain the health crisis found in Eastern Europe and the former Soviet Union during their transition years, including (1) the collapse of the medical care system (Ellman, 1994), (2) mass impoverishment and malnutrition (Field, 1995), (3) increased stress from the economic transition and stress-related alcohol consumption (Cornia & Paniccia, 2000; Leon et al., 1997; Brainerd & Cutler, 2005), and (4) a poor outlook for the future (Watson, 1995; Brainerd & Cutler, 2005).

(1) The collapse of the medical care system: Ellman (1994) argues that reasons for the increase in age-specific death rates and disease since the breakup of the Soviet Union lie in the failure of the medical care system – inadequate financing for medical staff and medical facilities, lack of medicines and other medical supplies, and the introduction of user payments for medical services. Under socialism, Soviet Union had the most remarkable universal health care system extended to every corner of the country (Brainerd & Cutler, 2005). During the transition, Soviet Union disintegrated, severe economy problems led to huge cutbacks in health care financing and a vast increase in out-of-pocket expenditures for patients. On the one hand, funding difficulties have led to a decrease in the capacity and effectiveness of the health care system itself (Brainerd & Cutler, 2005). On the other hand, increased out-of-pocket expenditures mean that many patients cannot afford the medical treatment – especially during a difficult transition period filled with economic frustrations (Reiss et al., 1996).

(2) Mass impoverishment and malnutrition: The most obvious explanation for the

rise in mortality is that the standard of living of the Russian population has deteriorated (Field, 1995). The transition from a command economy to a market in Russia means the liberalization of prices on produce, goods, and services, and the rapid large-scale of privatization of firms. As a result, price controls for basic goods collapsed, prices increased 633 times because of hyperinflation and the average real income of the population dropped two fold (Brainerd 1998, Shkolnikov et al., 1998). Even worse, Russia faced multiple economic crises during the transition and its economy at the end of the century was around three quarters of the size it had been seven years before (Stillman, 2006). Meanwhile, many aspects of the social welfare system have collapsed: the real value of retirement pensions has declined steeply (Brainerd, 1998); no adequate social protection for the population in response to dramatic social change and a lack of national means-tested benefit programs for families living below the poverty line (Brainerd & Cutler, 2005). A reduction in material living standards and a lack of nutrition contributed to Russia's health crisis.

(3) Increased stress from the economic transition and stress-related alcohol consumption: Most scholars argue the negative affect of transition on Russian people's health status is through the psychological mechanism. Many of them indicate that during the transition, the fast and unexpected dismantling of the Soviet system brought Russian into a completely unpredictable, uncertain and unsecure situation (Cornia & Paniccia, 2000; Shkolnikov et al., 1998; Brainerd & Cutler, 2005; Leon et al., 1997). As Brainerd and Cutler (2005) write,

> "Before 1989, Russians lived in a country that provided complete economic security: unemployment was virtually unknown, pensions were guaranteed and provided an adequate standard of living, and macroeconomic instability had never affected the average citizen. The economic reforms implemented in 1992 created

> an upheaval in the country that, while beneficial in many ways, changed the life course of virtually every citizen in the country. For the first time, the average Russian confronted a completely unpredictable future" (p.125).

Studies have found that massive transformations of the social environment can have a negative influence on the feeling of control over one's life (Gecas & Schwalbe 1983). A sudden inability to adapt to the fast-disappearing securities of socialism and the process of social, economic, and political transformation that occurred in Russia left many people in a state of confusion, uncertainty and calamity (Shkolnikov et al.,1998). Psychological stress arises when an individual perceives that his or her physical or psychological capacity is inadequate to respond to the demands of a situation (Shapiro, 1995). Mirowsky and Ross (2003) also indicate that individuals may experience more psychological distress when their future becomes less predictable and secure. Russia's transition, thus, created enormous stress for the Russian people (Shkolnikov et al., 1998).

Psychological stress influences health in two ways. One is the direct way: serious psychological distress may produce physiological reactions that impair health (Mirowsky and Ross 2003). Researchers find that a high level of stress is related to the development of cardiovascular disease – even independent of its effect on dietary and lifestyle factors (Labarthe 1998; Sapolsky, 1998). The other is the indirect way through stress-related behaviors. Adoption of certain less healthy behaviors is viewed as a response to psychological stress. Stress has a well-established connection with excessive alcohol consumption (Cockerham, 2009). There is evidence of the surges in alcohol abuse, suicide, and other negative reactions to extreme stress and anxiety that occurred in Russia (King, et al., 2009). Alcohol consumption has been found to have a large impact on mortality in Russia, especially as it relates to external causes of death, including

homicide, suicide, and accidents, and a high rate of premature deaths from cardiovascular causes (Brainerd & Cutler, 2005; Shkolnikov et al., 2004). Other dangerous behaviors related to the increased stress, including fast driving, violence towards others, and general criminal activity, also have been found to have an impact on mortality rates in Eastern Europe and the former Soviet Union (Brainerd & Cutler, 2005 and Shkolnikov et al., 2004).

(4) Poor outlook for the future: During the transition, Soviet societies were trapped in economic stagnation for quite a length of time, and economic frustrations yielded extreme disappointment (Bjørnskov et al. 2007). Widespread dissatisfaction in this region reflects not merely unhappiness with material life but with life in general (Inglehart & Siemienska 1988). Reflecting on the Soviet way of life in which the state provided full employment, free education and health care, as well as a wide array of social services, some people are even nostalgic for the pre-reform days (Lane, 2002, Brainerd & Cutler, 2005). Russians, on average, felt pessimistic about the future. Surveys conducted by the Central and East European Barometer program in the 1990s asked Russians about their expectations of future financial circumstances, and the results showed the average responses was between "stay the same" and "get a little worse" (Brainerd & Cutler, 2005).

Scholars have recognized the importance of hope in health status (Anda et al, 1993; Everson et al., 1996). Clinical and empirical evidence indicates that a lack of hope has a negative impact on psychological well-being and physical health (Everson et al., 1997). Hopelessness has been identified as a strong, independent predictor of cardiovascular disease morbidity and mortality in both American and Finnish populations

(Anda et al, 1993; Everson et al., 1996). Greater despair or hopelessness among middle-aged men is associated with higher risk of heart disease and heart attack, as well as earlier onset of artery disease, even controlling for risk factors such as alcohol consumption and smoking (Everson et al. 1997). Therefore, these results suggest that expectations about the future may also play a role in the health crisis in Eastern Europe and the former Soviet Union.

In sum, evidence from Eastern Europe and the former Soviet Union suggests that economic restructuring during the transition generally has the negative effect on individual well-being, which largely due to the sudden inability to adapt to the unpredictable, uncertain, unsecure life the transition created. Although research in the Chinese context is lacking, inspired by Hurst and O'Brien's (2002) study, we may expect a similar detrimental effect resulting from the restructuring on older people's wellbeing. Hurst and O'Brien's (2002) study on China's pension protests shows many retired workers have a strong feeling of disappointment to the shift from state socialist redistribution to market. They note that, although protests by Chinese pensioners occur largely in response to crises of subsistence, many retired workers also act out of a sense of nostalgia – they would gladly return to the pre-reform days "when they were respected and taken care of by the state… when they were revered and their livelihoods were protected" (p.360). Given the fact that the current generation of older people spent most of their lives under socialism, they are more likely to get used to living in a very predictable, very certain, and less competitive, planned society, and therefore are less likely to prepare for the new unpredictable, uncertain, and more competitive market-oriented society. As a result, older people may be more likely to miss the old days and

more likely to be negatively affected by market transition.

2.4. Interaction Effects of Individual Characteristics and Market Transition Context on Successful Aging

In addition to its direct effect, market transition may also affect different groups of people differently. Because of the protective role of education and social status, some groups may be able to find better ways to cope with market transition, or even gain from it. The issue is who are the beneficiaries of the market transition. In this section, I discuss which group may be the winners (i.e., benefit most) of market transition.

The existing debate about winners and losers of market transition in post-socialist societies mainly focuses on the shifting power between the redistributors and direct producers (Szeleny, 1978; Nee, 1989). Szelenyi (1978) argues there are two main groups in socialist countries: redistributors (e.g., administrators) and direct producers (e.g., entrepreneurs). The redistributors who hold political power in the state bureaucracy enjoy the privilege of non-wage compensations, such as housing, subsidies for transport, health and pension plans (Szelenyi, 1978). However, market transformation has changed their power. Szelenyi argues that one of the biggest effects of the market transformation is that because the free market is now allocating resources, the rewards of the former redistributors will decline, while the direct producers will get greater rewards. Based on this argument, Nee (1989) further proposes the market transition theory. His theory makes several important predictions regarding the effects of market transition on income attainment: first, socioeconomic attainment will favor direct producers (e.g., entrepreneurs) relative to redistributors (e.g., administers of the government or

enterprises, or the cadres). Second, the value of political capital (for example, communist party membership) will decline, while returns to human capital (working experience and/or education) will increase, and the returns to human capital should be greater in the private rather than the public sector. Third, by increasing prominence of entrepreneurship as a mechanism for upward mobility, market transition creates alternative paths of socioeconomic mobility. In other words, in a market transition society, redistributors will lose their advantages and privileges, relative to what the direct producers will get; people with more education will achieve higher social and economic status; and more people will become entrepreneurs and therefore will receive higher socioeconomic attainments, compared to other social groups.

Several empirical studies based on survey data collected in urban China during the late 1980s and early 1990s, however, do not support Nee's (1989) claims about decreasing redistributive power. These empirical studies argue that the cadres' political power under socialism maintain or even enhance in the transition from socialism to market-oriented economies. For example, Bian and Logan (1996), for example, find state cadres still get higher economic rewards than many other social groups. Those who have political and/or administrative power are able to convert this power into economic power in the market economy. Furthermore, they argue the politically-based privilege is more permanent and more deeply embedded in the economic situation. Thus the influence of bureaucratic positions is enhanced, rather than decreased. Parish and Michelson (1996) find that the power and the economic advantages of village cadres persisted during the market transition. Other studies show that state cadres benefited even more during the market transition period than before the economic reform because the resources that they

controlled increased (Xie & Hunnam, 1996; Zhou, 2000). Other research beyond China also contradicts Nee's (1989) prediction. Analyzing data from Hungary, Rona-Tas (1994) observes that the main beneficiaries of market transition are old elites who were able to convert their political power to economic advantage from the privatization of state enterprises.

Nee later (1992, 1996) proposes "partial market economy" argument in order to respond to his critics. Nee's "partial market economy" indicates that market transition has not changed China's economy into a "fully" marketized economy, rather, it has become an economy that partially relies on market forces and partially continues to heavily rely on the state. In this partially marketized economy, the positions of the cadres in certain areas, such as transportation, telecommunication, infrastructure, and energy, where the state still monopolizes, remains and becomes even more important (Bian & Logan, 1996). Cadre positions are associated not only with better income and occupational positions but also with access to political resources. And because they have access to areas that the state monopolizes, the cadres could have many opportunities for rent-seeking opportunities related to their position. But more importantly, because of their privileged access to the decision-making process, the cadres could easily use their positional power to influence state policies and governmental regulations in favor of their own interests (Zhou, 2000). In short, cadres keep benefitting, or even benefit more during the market transition.

2.5. Research Hypotheses

The conceptual model for this study is presented in Figure 2.2, which links the

individual factors and province-level social context, embodied by China's market transition, to individuals' aging outcome. Based on the theoretical propositions and literature discussed in this chapter, I generate seven major hypotheses to test in this study. Hypotheses 1-3 concern the effect of individual-level factor, Hypotheses 4-6 concern the effect of province-level market transition context, Hypothesis 7 concerns the cross-level interaction effects between individual SES and province-level market transition context.

Hypothesis 1: Older people with higher SES are more likely to age successfully.

Hypothesis 2: Older people who are engaged in healthy-related activities are more likely to age successfully.

Hypothesis 3: Older People who have social support are more likely to age successfully.

Hypothesis 4: Economic development is positively associated with successful aging. i.e. Older people live in more economically developed provinces are more likely to age successfully.

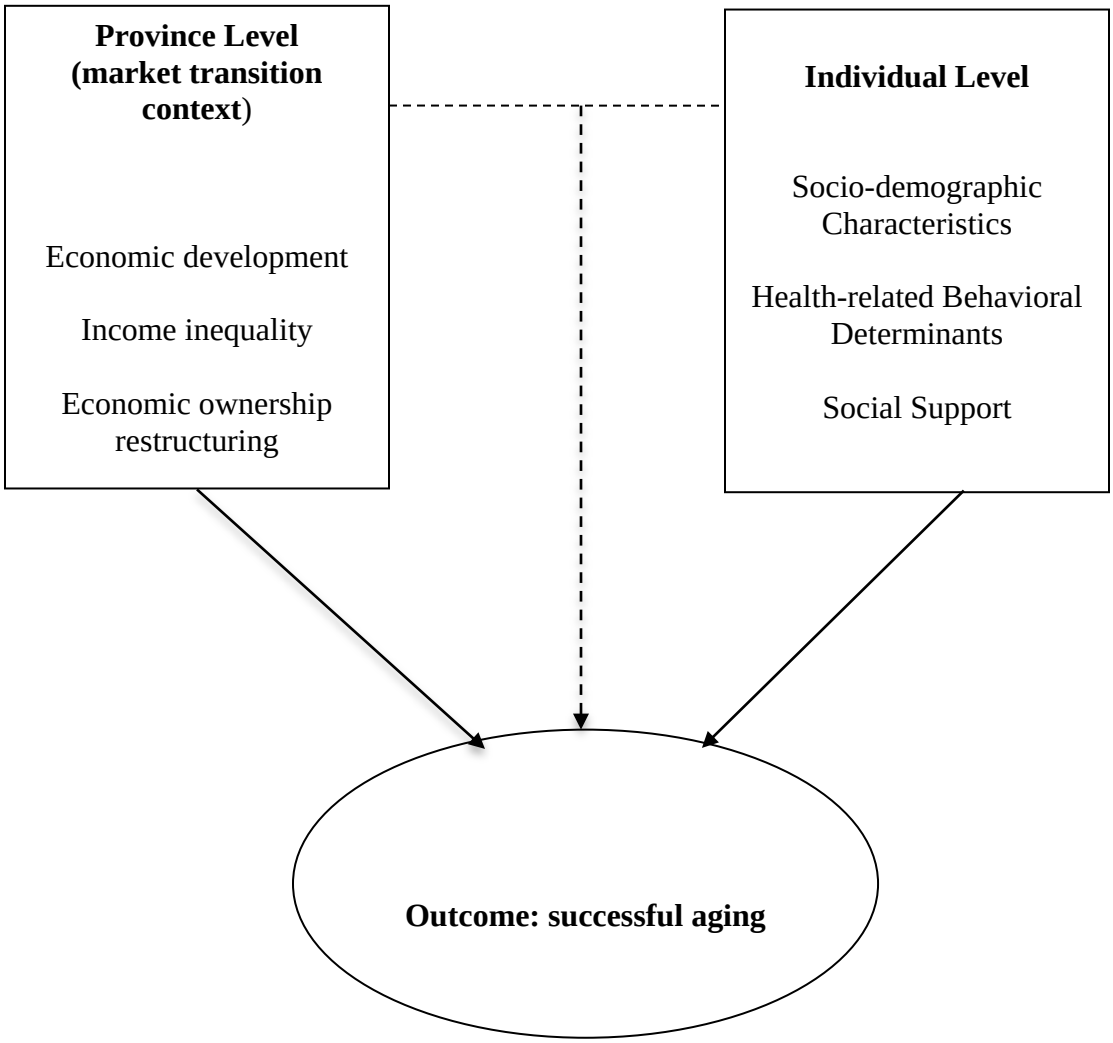
Hypothesis 5: Income inequality is negatively associated with successful aging. That is, older people living in provinces with higher level of income inequality are less likely to age successfully.

Hypothesis 6: Economic Ownership Restructuring is negatively associated with successful aging. That is, older people living in more marketized provinces are less likely to age successfully.

Hypothesis 7: More-educated older people will benefit most from market transition because market transition has enabled older persons with good educations to substantially improve their financial status through post-retirement employment (Davis,

1988; Hayward & Wang, 1993). Elderly cadres also will benefit most from market transition because cadres' power is maintained or even enhanced during market transition.

Figure 2.2: Conceptual Model
Direct effects are indicated by solid paths, Cross-level interactive effects are indicated by dashed paths



Chapter Three

Data and Methods

This Chapter begins with a description of datasets used in the analyses. The second section presents a discussion of the measurements of dependent and independent variables. In the third section, I discuss analysis strategies and statistical models.

3.1. Datasets

This study drew data from multiple sources. The individual-level data came from the 2000 Chinese Longitudinal Healthy Longevity Survey (CLHLS), and the province-level data was combined from China Provincial Statistical Yearbooks (2000), China Labor Statistical Yearbooks (2000), and China Township and Village Enterprises Statistical Yearbooks (2000).

3.1.1. Individual-level data

Individual level data came from the 2000 wave of a nationally representative survey in China – Chinese Longitudinal Healthy Longevity Survey (CLHLS). The survey was conducted by Duke University in collaboration with Beijing University (China) with the support of National Institute on Aging (NIA). The CLHLS, initiated in 1998, is the first and largest survey of older adults in China. Using stratified probability sampling, the sample was randomly selected from half of the counties and cities in 22 provinces out of

the 31 provinces[1] in China, covering both urban and rural areas (Zeng et al., 2001). The 22 surveyed provinces include 4 northern provinces (Hebei, Beijing, Tianjing, Shanxi), 3 northeastern provinces (Liaoning, Jilin,Heilongjiang), 7 eastern provinces (Shanghai, Jiangsu, Zhejiang, Fujian, Anhui, Jiangxi, Shandong), 3 central provinces (Henan, Hubei, Hunan), 2 southern provinces (Guangdong Guangxi), 2 southwestern provinces (Sichuan, Chongqing), and 1 northwestern province (Shaanxi). These provinces constitute 85 percent of the total population of China (Zeng et al., 2001). The response rate was reported to be 88 percent, and assessment of the data reliability has been conducted and found to be of high quality (Zeng et al., 2001). Further details of the survey's sampling design can be found in Zeng et al. (2001) and Zeng & Vaupel (2002).

The 2000 wave of the CLHLS collected data from 11,199 older adults aged 78 – 124, and it provided considerable information on demographics, socioeconomic status, health status, lifestyle, living arrangements, and other aspects of life.

3.1.2. Province-level data

Province-level data came from China Provincial Statistical Yearbooks (2000), China Labor Statistical Yearbooks (2000), and China Township and Village Enterprises Statistical Yearbooks (2000)[2]. The CLHLS sample consisted of residents from 22 province-level administrative units, of which four are major cities (Beijing, Tianjin, Shanghai, and Chongqing). The data contained provincial codes that enable me to trace the provinces in which respondents resided. The provincial-level variables were merged

[1] The excluded 9 provinces are Hainan, Guizhou, Yunan, Xizang (Tibet), Gansu, Qinghai, Ningxia, Xinjiang, and Inner Mongolia. These provinces are not included in the survey largely due to potentially inaccurate age reporting (Zeng et al., 2001).
[2] All of these province-level statistics are available at China Data Online: http://chinadataonline.org

with the individual data based on provincial codes. Table 3.1 lists the number of individuals in each province.

Two considerations regarding data selection should be noted here. First, this study used province as the macro-level unit to capture the market transition contextual information based on two reasons: (1) China's market transition has been known as a spatially uneven process (Li & Wei, 2010). Policy bias (Ho & Li, 2008; Lu & Wang, 2002) and fiscal decentralization (Kanbur & Zhang, 2005; Tsui & Wang, 2008) largely shapes the regional variation. China's market transition started with a coastal development strategy. During the transition, the eastern coastal provinces have been benefiting from the preferential policies that fueled their development and made them much more economically prosperous and much richer than the inland provinces (Ho & Li, 2008; Lu & Wang, 2002). Moreover, fiscal decentralization triggered local protectionism and interregional competition for business, which further reinforced the regional variation (Kanbur & Zhang, 2005; Tsui & Wang, 2008). Since the pace and consequences of transition varies widely across provinces (Han & Pannell, 1999; Wang & Hu, 1999), therefore, using national level information cannot capture the huge variation in makertization across China. (2) Some administrative units lower than province, such as county, township or village, may not be an appropriate unit to study market transition. Wang & Hu (1999) suggest that the pace and consequences of China's market reform differ more substantially between provinces than within each province. In addition, some dimension of market transition, such as income inequality, would be better examined by using a large unit (Wilkinson & Pickett, 2006). Specifically, Wilkinson & Pickett (2006) argue that income inequality is more evident in a larger

context (e.g. state or province) than in a smaller homogeneous community and therefore a statewide or province-wide inequality had more effect on population wellbeing than a communitywide inequality. Therefore, province, as an economic, administrative, and political unit that is deeply involved in the process of market transition planning (Wang & Hu, 1999), should be the appropriate unit for capturing China's regional variation in market transition in this study.

Second, I chose 2000 data for this study largely because in 2000 was during the period when China was experiencing the accelerated restructuring of the state-owned sector. Since the late-1990s China has witnessed a second wave of state-owned enterprise (SOE) reform, which has involved accelerated change in enterprise ownership compared to the first wave of reform from 1978 to the early 1990s (Yusuf, Nabeshima, & Perkins, 2006). The Communist Party of China's 15th Congress held in 1997 officially endorsed the policy of "grasping the big and letting go of the small" (*zhuada fangxiao*). This policy means retaining state ownership of large state-owned enterprises while allowing small and medium-sized ones to undergo ownership transformations. According to a national survey reported by Garnaut et al. (2005), most SOEs (86%) had been through restructuring by the end of 2001, and 70 percent had been fully or partially privatized. Therefore, using datasets from this time period allows me to capture the impact of rapid market transition on individuals' aging experiences.

3.2. Variables and Measurements

The following section describes the dependent and independent measures. Table 3.2 lists all the measures.

3.2.1. Dependent Variables

The outcome of interest in this study was successful aging. I used two ways to measure successful aging: objective measure and subjective measure. Objective successful aging was measured based on Rowe and Kahn (1998)'s concept. Subjective successful aging was measured based on the respondents' attitudes toward aging.

3.2.1.1. Objective Measure of Successful Aging

Guided by Rowe and Kahn (1998)'s concept, I defined objective measure of successful aging as (1) having no activity of daily living (ADL) limitation, (2) having no cognitive impairment, and (3) being actively engaged in life.

(1) No activity of daily living (ADL) limitation: The ability to perform activities of daily living (ADLs) is fundamental to maintaining older people's independence and quality of life (Kempen& Suurmeijer, 1990; Sato et al., 2002; Wang, van Belle, Kukull, & Larson, 2002; Elderweb, 2004). Rowe and Kahn (1998) also note that performing activities of daily living and that maintenance of independence is a principal goal of many elders. ADL measures are often used to determine long-term care placement decisions: whether older people can care for themselves independently or need to live in a nursing home, be hospitalized, or receive home care (Hoenig et al., 1999). Slivinske et al., (1998) assessed 574 older people's level of disabilities and found those receiving in-home/home health care on average experienced one ADL problem while those in the community centers averaged less than one combined ADL-IADL difficulty. One previous study on successful aging, e.g. Strawbridge et al. (2002), used ADLs as one of the criteria of successful aging to assess the presence of disability. Specifically, they defined a respondent as disability free when he or she reported no difficulty with any of the six

ADLs. Following this study, I also used the strict no ADL limitation as the criterion. The survey asked respondents whether they had any difficulty with each of the following six daily activities: eating, dressing, bathing, toileting, transferring, and continence. For each item, a score was assigned to having limitations, with 0 being "complete self control." The total measure is a dichotomous measure of the presence of any ADL limitations (1=yes vs. 0=no).

(2) No cognitive impairment: Cognitive functioning was measured by the Mini-Mental State Examination – MMSE (Folstein, Folstein, & McHugh, 1975). The MMSE has been used extensively across cultures and has been reported to be a valid measure of cognitive functioning among Chinese older adults (Katzman et al., 1988; Salmon et al., 1989). This study used a Chinese version of Mini-Mental State Examination (MMSE), which was culturally translated from the international standard MMSE and adopted some appropriate adjustments based on the ordinary Chinese older people's education level in order to make the questions more understandable and answerable (Zeng & Vaupel, 2002, Zhang, 2006). The Chinese MMSE examined four aspects of cognitive wellness of the Chinese older people: orientation, memory, attention, and recall (Zeng & Vaupel, 2002). Specifically, respondents were asked 5 orientation questions (naming the current time, animal year, festival, current season, and county or district they lived in), 1 naming foods question (respondents were asked to name as many kinds of food as possible in 1 minute, with 7 foods as the maximum), 6 word recall questions, 5 calculation questions, (respondents were asked to subtract 3 from 20, then 3 from the previous resulting, and so on), 3 language questions (repeating a sentence and naming items such as pen and watch), 1 drawing question, and 3 comprehension questions (respondents are asked to

take paper in their right hand, fold it, and then put it on the floor). For each question, if the respondents answered the question correctly, the score took 1, otherwise 0. Following previous studies (e.g. Herzog & Wallace, 1997; Zhang, 2006), I treated the response of "unable to answer" as an incorrect answer. The range of scores for MMSE was 0 to 30, with higher scores indicating good cognitive ability. Because there are no established guidelines for determining cognitive impairment in Chinese older people (Zhang, 2006), I used the standard MMSE cut score of 24 (Borson et al., 2003). Respondents were defined as having cognitive impairment if their score of MMSE was less than 24.

(3) Being actively engaged in life: Active engagement criterion of Rowe and Kahn's successful aging consists of interpersonal relations and productive activities. In CLHLS, respondents were asked if they engaged in a variety of activities regularly, including: (1) helping with housework; (2) playing cards and/or mah-jong with others; (3) attending religious activities; and (4) doing garden work or field work. Among these activities, helping with housework and doing garden work or fieldwork belongs to productive activities. Playing cards and/or mah-jong with others and attending religious activities can be viewed as variants of contacting with friends, neighbors, or relatives that was previously used to assess active engagement in successful aging studies (Garfein & Herzog, 1995; Strawbridge et al., 2002; McLaughlin et al., 2010). For this study, I constructed the variable "actively engaged in life" by assigning a score of 1 to respondents who did at least one of the aforementioned activities regularly. I assigned a score 0 to respondents who did not do any activities.

Finally, the respondent was coded as a "successful ager" (=1) if he or she met all these three criteria (i.e. No difficulty with any of the six ADLs, and MMSE>=24, and regular participation in one or more productive or social activities), otherwise 0.

It should be noted here that in this study the original version of Rowe and Kahn's concept was modified by removing "no major diseases" criterion. While the original Rowe and Kahn's definition requires that an individual should be free from major chronic diseases to be identified as a successful aging, this criterion was later excluded from the measure of dependent variable. The primary reason for the exclusion of this criterion was that chronic disease items in CLHLS might be problematic. In the survey, interviewees were asked whether they were suffering a list of chronic diseases, the answers to this question, however, were all self-reported rather than based on a physician's diagnosis. Thus, few rural respondents reported having major chronic diseases not because they were illness free, but more likely because that they were under-diagnosed due to a lack of accessibility to medical care. Given this potential measurement problem, this study excluded the "no major diseases" criterion.

3.2.1.2. Subjective Measures of Successful Aging

Another set of dependent variables is subjective measures of successful aging. Although CLHLS did not ask subjects directly whether they were aging successfully, two questions in the survey are related to the attitudes toward aging. The subjective measures of successful aging, therefore, are based on these two questions. In the CLHLS survey, subjects were asked to respond to the questions (1) "are you as happy as when you were younger?" and (2) "do you feel the older you get, the more useless you are?" on a five point ordinal scale from "1=never" to "5=always." In this study, I recoded these two five-

scale variables into two dichotomous variables. Specifically, respondents were asked, "Are you as happy as when you were younger?" Those that answered "often" or "always," were coded as a "subjectively defined successful ager (as happy as when younger)" (=1), otherwise 0. Similarly, when asked "Do you feel the older you get, the more useless you are?" respondents that answered "never" or "seldom" were coded as a "subjectively defined successful ager (feeling as useful as when younger)" (=1), otherwise 0.

I calculated the Cronbach's alpha to measure the internal consistency to see whether these two measures can be combined in a single measure. A high value of the Cronbach's alpha implies a higher internal consistency. The Cronbach's alpha turned out to be .35, which suggests the internal reliability of the scale is low[3]. Therefore, I did not combine the "feeling as useful as when younger" variable and "as happy as when younger" variable into a single measure and treated them as two separate dependent variables.

3.2.2. Independent Variables

The independent variables include individual level and province level variables. Both are described in this section.

3.2.2.1. Individual-level Independent Variables

I selected the individual-level covariates based on previous literature on successful aging (Rowe & Kahn, 1998; Depp & Jeste, 2006), and these fell into three

[3] Traditionally, reliability coefficients below 0.5 are seen as unreliable, measures between 0.5 and 0.7 are modest, and levels of the Cronbach's alpha above 0.7 indicate acceptable levels.

categories: (1) socio-demographic characteristics; (2) health-related behavioral determinants; and (3) social support.

(1) Socio-demographic characteristics: The first set of variables included age, gender, and ethnicity. *Age* was chronological measured in years. *Gender* was dummy coded as female=1 and male=0. *Ethnicity* was treated as a dichotomous variable. Ethnic minority people (*Hui Chinese*, *Zhuang Chinese*, *Yao Chinese*, *Korean Chinese*, *Man Chinese*, *Mongol Chinese*, or others) were coded as 1 and ethnic majority people (*Han Chinese)* 0.

The second set of variables, which include education and primary lifetime occupation, were used to measure a respondent's overall SES. *Education* was measured as a 3-category variable according to one's years of formal schooling: (i) never entered school, (ii) finished elementary education (1 to 6 years), and (iii) more than elementary education (more than 6 years). *Primary Lifetime Occupation* was conducted as a 4-category variable: (i) cadres[4] or managerial personnel; (ii) non-agricultural workers; (iii) agricultural workers; (iv) never formally employed by the work units including those who did not work outside the home. Among these four occupational groups, cadres or managerial personnel had the highest social status, while those who never formally employed had the lowest social status.

It is worth noting that although urban versus rural residence is frequently used as one of the key indicators defining an individual's socioeconomic status and opportunities in China (Cheng & Selden, 1994; Zhu & Xie, 2007), this variable was not included in the

[4] Cadre refers to public officials holding responsible or managerial positions in party and government. In most cases, being a Chinese Communist Party (CCP) member is the precondition to becoming a cadre.

current study. The main reason for the exclusion of urban versus rural residence was the possible multicollinearity. Under China's household registration (*hukou*) system, each citizen is required to register in one place of regular residence. This groups everyone into urban people (living in cities or towns) or rural people (living in villages or state farms). The household registration system is far more than a residential categorization, more importantly, it entitles a person at his or her *hukou* location (either rural residents or urban residents) to employment opportunities (Cheng & Selden, 1994). In most cases, it preserves urban jobs (non-agricultural sectors) for urban residents and bounds the rural people to the land and restricts them from moving to non-agricultural sectors. Although in the last decades, the government has been relaxing the strict household registration system, this oldest-old sample, averaged 91 in 2000, was among the generations whose lifetime occupation highly related with their residential locations (rural or urban). Statistically, Chi-square test also showed that urban versus rural residence was significantly associated with lifetime occupation ($p<.001$) in this sample. Therefore, here I relied on education and lifetime occupation as measures of SES in the analyses.

(2) Health-related behavioral determinants included *smoking, alcohol consumption,* and *regular exercises*. For each behavior, those who responded that they never had been engaged in this behavior were coded as "never," those who did in the past but had quit were coded as "former," and those who were currently engaged in this behavior were coded as "current."

(3) Social support had three measures: *living arrangements, frequent sibling-visit, and frequent child-visit*. The dataset included information on every person living in the household and their relationship to the elderly respondent. Based on these questions, a

six-category variable of *living arrangements* was created: (i) living in a nursing home, (ii) living alone, (iii) living with a spouse (without children but may have others), (iv) living with children (without the spouse but may have others), (v) living with spouse and children (may have others), and (vi) living with others (living with some persons other than children and spouse). These six categories were mutually exclusive. The survey also asked questions regarding intergenerational contact. Each interviewee was asked whether each of his/her non-coresident children visited him/her frequently or not. If the respondent answered "yes" to this question, the variable of "*frequent child-visit*" was coded as 1, otherwise 0. In the same way, *frequent sibling-visit* was also dichotomously coded as: "having frequent sibling visits" =1 vs. no =0.

3.2.2.2. Province-level Independent Variables

In the analysis, province-level independent variables cover three dimensions of province context: economic development, income inequality, and economic ownership restructuring.

Economic development was measured by GDP per capita. Income inequality is frequently measured by Gini coefficient. However, due to the difficulty in getting appropriate data, there are no studies on the province-level Gini coefficients in China. Following Park et al. (2003), I measured income inequality by calculating the log income differentials between the 80^{th} and 20^{th} percentiles:

$$Income\ inequality = ln(income80^{th}) - ln(income\ 20^{th})$$

Economic ownership restructuring is measured by proportion of non-state-owned sector employees:

Proportion of non-state-owned sector employees = (no. of urban non-state-owned sector employees + no. of Township and Village Enterprises employees +no. of rural private enterprises employees) / total employed people

3.3. Analytic Strategy

3.3.1. Missing Data Analysis

I first examined the percentage of missing data in each variable. Missing data was not an issue in the province-level variables. There was less than 1 percent missing data in demographic variables: 0.18 percent in *Ethnicity;* 0.74 percent in *Education;* 0.06 percent in *Occupation*. Missing data in behavioral variables was around 0.2 percent: 0.16 percent in *Smoking*; 0.12 percent in *Alcohol Consumption*; 0.18 percent in *Exercises*; Missing data of *ADL* variable was 0.19 percent. Missing data of *Feeling as Happy as When Younger* was 13.6 percent; missing values of *Feeling as Useful as When Younger* were 12.2 percent.

Researchers and statisticians suggest that the pattern of missing is more important than the number or type of missing data (Allison, 2002; McKnight, McKnight, Sidani, & Figueredo, 2007; Tabachnick & Fidell, 2007). There are three types of missing data: missing completely at random (MCAR), missing at random (MAR), and missing not at random (MNAR) (Allison, 2002; Graham, 2009). With missing completely at random (MCAR), missing data of a variable is unrelated to the values of that variable and all other variables in the dataset. In this situation, the missing data can be ignored. However, the other two types of missing data may not be ignored. With missing at random (MAR), the missing data may depend on observed data, but not on unobserved data; while with

missing not at random (MNAR), missing data depends on unobserved data (Graham, 2009). The proper handling of missing data is necessary to prevent unbiased estimates (Allison, 2002). MCAR is very rare in research (Acock, 2005; Saunders et al., 2006). Missing data that are MAR can be handled with most "modern" missing data procedures (Tabachnick & Fidell, 2007). However, MNAR missingness is considered a problem because it yields biased parameter estimates.

I tested for patterns of missing data between each independent variable and the dependent measure. I transformed each independent variable into a binary variable, where 1 = missing values in one or more cases and 0 = no missing values. A nonsignificant chi-square statistic suggests that data may be MCAR. My results indicated a significant chi-square statistics, suggesting that the data are not MCAR and supporting the possibility that MAR data exists in the present dataset.

There are several ways to deal with missing cases in the data. Listwise deletion assumes the data are missing completely at random (MCAR), while multiple imputation makes the less restrictive assumption that the data are missing at random (MAR) (Little & Rubin, 2002). Under the assumption of MAR, I used multiple imputation to handle missing data. Multiple imputation involves imputing values for each missing value in a data set *m* times. In each of the *m* created data sets, the observed (non-missing) values are not transformed while the missing data are drawn randomly from the conditional joint distribution of the other variables in the data set (Little & Rubin, 2002). Each of the *m* data sets is analyzed separately. The results from these analyses are combined to account for within sample variation in the data and between sample variation created by multiple imputation (Stata Library). Unlike the single imputation, multiple imputation has the

advantage of "producing standard errors that reflect the degree of uncertainty due to the imputation of missing values" (Stata Library).

The ICE software program available in STATA was used to impute missing values (Royston, 2005). ICE procedure offers an obvious advantage that it does not require multivariate joint distribution assumption. ICE procedure allows different types of variables to be imputed simultaneously (Ambler, Omar, & Royston, 2007). In this study, logistic regressions were used to complete the missing values of dichotomous variables (ethnicity and ADL). And multinomial logistic regressions were applied to complete the missing values of polychotomous variables (education, occupation, smoking, alcohol consumption, and exercises). Following the suggestion of Rubin (1987), I set the number of imputed datasets at five.

Analytic models are estimated five times, with one estimate per dataset, and the coefficients for each estimation are averaged over the five regressions (Rubin, 1987). The estimated standard error of coefficients takes into account the uncertainty within each imputation by averaging the standard error across the five regressions, and combines this with a component for the variation in the estimated coefficients across imputations, which takes into consideration the uncertainty between imputations (Rubin, 1987; Little & Rubin, 2002).

3.3.2. Multilevel Modeling

The data structure for this study is multilevel because there are two different levels of attributes: one at the individual-level and the other one at the province-level (individuals are nested within 22 province-level administrative units), which requires multilevel statistical models. Multilevel models are primarily used when the study

includes predictors at different levels, and when it aims to combine multiple levels of analysis into a more comprehensive model and to properly account for the variability associated with each level of the hierarchy (Raudenbush & Bryk, 2002; Steenbergen & Jones, 2002; Cheung & Au, 2005).

In past studies, the two most common procedures used to examine hierarchical structure include disaggregation model and aggregation model (Cheung & Au, 2005; Poston & Duan, 2001). The first procedure is to disaggregate all the contextual macro-level variables down to the individual level. In the case of my dissertation, which examines the effects of provincial market transition characteristics on the likelihood of being successful agers, this would involve assigning the characteristics of the province to the individual elders. I would then use traditional logistic regression. This approach violates the independence of data assumption because the observations in a specific context are not independent: that is, individuals from the same province have the same values on the province characteristics. As a result, it leads to standard errors smaller than they should be.

The other approach is to aggregate the individual-level characteristics up to the contextual macro level and to conduct the analysis at the aggregate level. In the case of my dissertation, I would aggregate, that is, average, the individual characteristics on successful aging, educational attainment, occupational status, behavior determinates, and social support up to the province level of analysis and then conduct an analysis among provinces. The main problem with this approach is that all the within-group variation would be ignored. As Poston and Duan (2001) note, interpreting the aggregate relationship at the individual level could lead to distorted or even fallacious results.

In addition, another alternative way to address clustering in multilevel data structures is to include dummy variables to account for subgroup differences in a traditional regression model, but the problem with this approach is that, noted by Steenbergen and Jones (2002), dummy variables only indicate the subgroup differences but cannot explain "why the regression regimes for the subgroups are different (pp.220)". Multilevel models, however, allow for the accurate calculation of standard errors, and the explicit examination of independent variables and variance at multiple levels, as well as the variation in individual-level effects by group-level characteristics (known as cross-level interactions) (Raudenbush & Bryk, 2002). Therefore, multilevel statistical models are employed for this study.

Two-level random intercept logistic regression models were used for this study because the outcomes of interest were dichotomous variables. In this analysis, level 1 is individual-level variables; and level 2 is contextual (i.e. province-level) effects. The overall model is:

$$\log\left(\frac{\pi_{ij}}{1-\pi_{ij}}\right) = \beta_{0j} \sum_{q=1}^{Q} \beta_{qj} X_{qij}$$

$$\beta_{0j} = \gamma_{00} + \sum_{s=1}^{S} \gamma_{0s} Z_{0sj} + u_{0j}$$

where X are individual-level factors; Z are province-level factors. β_{0j} is the intercept, or the average log-odds of successful aging within province *j* when all other covariates are zero. X_{qij} is the value of covariate *q* associated with individual *i* in province *j*; β_{qj} is the effect of that covariate on successful aging in province *j*. γ_{00} is the common intercept across provinces. Z_{0sj} is the value of province-level covariate *s* in province *j*. γ_{0s} is the

effect of the province-level covariate on successful aging and u_{0j} is the unique contribution to the intercept associated with province j.

3.3.3. Analysis Steps

The general analysis steps for two-level random intercept logistic regression models are as follows:

An unconditional or null model (a model with no independent variables at either level and only the intercepts in the random part of the model) was estimated first to determine whether there was significant variation in outcome between provinces. This model assesses the possibility that provinces, on average, tend to have higher or lower log odds of successful aging (Snijders & Bosker, 1999). This model presented a baseline for comparing the size of contextual variations in successful aging in subsequent models (Bryk & Raudenbush, 1992).

Model 1 predicted successful aging outcome with only individual-level characteristics with province clustering controlled. Model 2 predicted successful aging with individual characteristics, province clustering controlled, and province characteristics included. Model 3 added the cross-level interaction between key individual characteristics (*education, major lifetime occupational status*) and province-level characteristics to the full models.

All the continuous covariates were grand mean centered in order to facilitate model convergence and to make results more interpretable (Raudenbush & Bryk, 2002).

Estimates for two-level random intercept logistic regression models were conducted by using *xtmelogit* command in STATA 12 (Rabe-Hesketh, Skrondal, &

Pickles, 2004). The *mi estimate* was used in addition to *xtmelogit* in order to estimate models based on five imputed datasets.

Table 3.1 Numbers of Individuals in Each Province

Provinces	Freq.	Percent (%)
(Northern Provinces)		
Bejing	226	2.02
Tianjing	121	1.08
Hebei	126	1.13
Shanxi	120	1.07
(Northeastern Provinces)		
Liaoning	437	3.90
Jilin	270	2.41
Heilongjiang	256	2.29
(Eastern Provinces)		
Shanghai	454	4.05
Jiangsu	1,338	11.95
Zhejiang	942	8.41
Anhui	596	5.32
Fujian	500	4.46
Jiangxi	209	1.87
Shandong	473	4.22
(Central Provinces)		
Henan	460	4.11
Hubei	426	3.80
Hunan	383	3.42
(Southern Provinces)		
Guangdong	727	6.49
Guangxi	1,359	12.14
(Southwestern Provinces)		
Sichuan	1,168	10.43
Chongqing	398	3.55
(Northwestern Province)		
Shaanxi	210	1.88
Total	11,199	100.00

Table 3.2 The Operationalization of Dependent and Independent Variables

Dependent Variables	
Objectively defined successful ager	Did the older people achieve successful aging? Criteria: (1) No difficulty with any of the six ADLs, and (2) MMSE>=24; and (3) Must have reported regular participation in one or more productive or social activities Dichotomous variable: 0=no, 1=yes
Subjectively defined successful ager: as happy as when younger	Dichotomous variable: 0=no, 1=yes
Subjectively defined successful ager: feeling as useful as when younger	Dichotomous variable: 0=no, 1=yes
Independent Variables	
Individual Characteristics	
Age	Continuous variable
Gender	0=male, 1=female
Ethnicity	0=ethnic majority (*Han Chinese*), 1=ethnic minority
Education	Categorical variable, where 1=never entered schools 2=finished elementary education (1 to 6 years) 3=more than elementary education (more than 6 years)
Primary Lifetime Occupation	Categorical variable, where 1=cadres and managerial personnel 2=non-agricultural workers 3=agricultural workers 4=never formally employed
Smoking Behavior	Categorical variable, where 1=never 2=former 3=current
Alcohol Consumption	Categorical variable, where

	1=never 2=former 3=current
Regular Exercise	Categorical variable, where 1=never 2=former 3=current
Living Arrangements	Categorical variable, where 1=living in a nursing home 2=living alone 3=living with a spouse (without children but may have others) 4=living with children (without the spouse but may have others) 5=living with spouse and children (may have others) 6=living with others only
Frequent sibling-visits	0=no frequent sibling-visits, 1=having frequent sibling-visits
Frequent child-visits	0=no frequent child-visits, 1=having frequent child-visits
Province-level Contextual Characteristics	
Economic Development	GDP per capita (continuous variable)
Income Inequality	Log income differentials between the 80^{th} and 20^{th} percentiles (continuous variable)
Economic ownership restructuring	Proportion of non-state-owned sector employees (continuous variable)

Chapter Four

Results

The objective of this research was to identify relationships between provincial market transition characteristics and successful aging as well as cross-level interactions between determinants of successful aging among older adults in China. The chapter focused on answering the following questions:

(1) To what extent do individual level characteristics affect successful aging?

(2) To what extent do province level market transition characteristics affect successful aging?

(3) What are the interaction patterns between province level market transition characteristics and individual SES that affect successful aging?

This chapter presents the results of the data analyses. The chapter begins with descriptive findings, followed with the results of multilevel logistic regression models.

4.1. Descriptive Findings

4.1.1. Descriptive Statistics of Individual-level Independent Variables

Table 4.1 presents the descriptive statistics of individual-level independent variables, pooled across all 22 provinces. The sample (N=11199) averaged 91.3 years old (SD=7.57). The gender distribution shows that slightly over half were female (58.47%).

The sample comprised 93.79 percent *Han* Chinese and 6.21 percent ethnic minority Chinese.

The educational attainment level in this sample was low. Approximately 64 percent of the respondents never received any formal schooling. About 27 percent of the respondents had an elementary education (i.e. less than six years of schooling). Only 8.69 percent of them had more than an elementary education (i.e., more than six years of schooling). The occupational status of this sample was also low; the majority was either agricultural works (51.76%) or never formally employed (21.88%). Only around 8 percent of the respondents had high-rank occupations such as cadres or managerial personnel.

In terms of health-related behaviors, most of the respondents were never involved in health-risky behaviors such as smoking (65.62%) or alcohol consumption (64.98%). Only about 18 percent respondents were current smoker, and 20 percent currently consumed alcohol. Approximately 33 percent of the respondents in this survey did regular exercises.

Coresidence was very common in this sample of Chinese older people. Most older people (61.49%) lived with their adult children. About 10 percent lived with their spouses only, and 8 percent lived with their spouses and adult children. Only about 11 percent lived alone. Very few people (7%) lived in institutions. The descriptive analysis also showed intimate relationships between old parents and their non-coresident children. Most respondents' (73.33%) children visited their old parents frequently. However, few respondents (17.70%) had frequent sibling-visits.

4.1.2. Descriptive Statistics of Province-level Independent Variables

Market transition contextual details about 22 provinces are reported in Table 4.2. The distributions of GDP per capita, income inequality, and the proportion of non-state-owned employment are shown in Figure 4.1-4.3. The mean of GDP per capita in 2000 was 9,616.21 RMB (about 1,513 USD) (SD=6.53). Shanghai (a eastern coastal provincial-level city) was by far the wealthiest, with a per capita GDP of 34,546.98 RMB (about 5,437 USD), nearly 8 times that of Guangxi province (a southern province) that was far lower than any of the 22 provinces.

Income inequality, as measured by log income differentials between the 80^{th} and 20^{th} percentiles, ranged from .7519 to 1.1647 and had a mean of 0.9987 (SD=0.11) with a standard deviation of 0.11. Jiangsu province (an eastern province) had the highest income inequality (1.1647) while the richest province – Shanghai – had the lowest with 0.7519.

Economic ownership restructuring was measured by the proportion of non-state-owned employees, which varied from a low of 20 percent in Chongqing (a southwestern provincial-level city) to a high of 65 percent in Shanghai. On average, 37.94 percent of employees (SD=13.69) in 2000 worked in non-state-owned sectors, among these 22 provinces.

To check for the potential multicollinearity among province-level variables, I first examined the correlations between the variables. The correlation between GDP per capita and income inequality was -.23, -.53 for GDP per capita and the proportion of non-state-owned sector employees, and .10 for income inequality and the proportion of non-state-owned sector employees. All correlations were lower than the threshold value of 0.7. I then examined the Variance Inflation Factor (VIF). Allison (1999) argued that examining the correlations between the variables may not always be sufficient and suggested a

examining the VIFs was probably superior to examining the bivariate correlations. The VIFs for GDP per capita, income inequality, and the proportion of non-state-owned sector employees were 1.74, 1.06, 1.67, respectively. Allison (1999) suggested that any VIF over 2.5 indicated problematic collinearity. My results showed that I could rule out serious estimation errors due to multicollinearity.

4.1.3. Descriptive Statistics of Objective Measure of Dependent Variable

Across all individuals and provinces, approximately 44% (N=4979) of the sample met criteria for successful aging based on the modified Rowe and Kahn's concept, that is, having no activity of daily living (ADL) limitation, having no cognitive impairment, and being actively engaged in life. The prevalence of successful aging calculated from this study is larger than previous studies using the strict Rowe and Kahn's concept that encompasses disease and disability, cognitive and physical functioning and social participation. For example, Strawbridge et al.'s (2002) Alameda County Study found that fewer than 20% of participants met Rowe and Kahn's definition. McLaughlin et al (2010) used data from the Health and Retirement Study to calculate the prevalence of successful aging and found that no more than 11.9% of older adults were aging successfully at any of the four time points: 1998, 2000, 2002, and 2004. However, if compared with other successful aging research, the result here is within the range across studies. For example, Depp and Jeste (2006) reviewed successful aging studies published during 1978-2005 which used not only self-assessed successful aging but also researcher-assessed objective criteria, and find a large range of the prevalence of successful aging: from 0.4% to 95%. Another review article (Peel et al., 2005) examined successful aging or healthy aging

studies between 1985 and 2003 and concluded similarly that the range varied across studies, with the percentage of successful agers from 13% to 48%.

Differences in the percentage of successful agers were observed among subgroups, as can be seen in the Table 4.3. Comparing successful aging for men versus women, the prevalence of successful agers was generally lower among women. As displayed in Table 4.3, the prevalence of successful aging for women was 35.68 percent as compared with 56.83 percent of men. Chi-squared test for gender differences for successful aging outcome was significant at $p<0.001$. The results, however, found no statistical difference for successful aging between ethnic minority people (47.41%) and the ethnic majority – Han Chinese (44.26%).

Differences in successful aging were also obvious across different education level and occupation groups. In terms of different education level groups, as shown in Table 4.3, the biggest difference was for those with more than elementary school education and those with no formal education. The majority of those with a more than elementary education (62.38%) experienced successful aging, while only 36.89 percent of those with no former education identified as successful agers. For primary lifetime occupation, the patterns of successful aging were similar to that of education. Specifically, about one third of those (33.18%) who were never formally employed experienced successful aging. In comparison, about 60.94 percent of those who were cadres or managers experienced successful aging.

Successful aging also differed cross-provincially in China. Table 4.4 and Figure 4.4 present the distribution of successful aging by provinces. The prevalence of successful aging was lower in Northern (between 29% and 43%) and Northeastern

provinces (between 27% and 37%) than in Central (between 33% and 55%), Eastern (between 35% and 54%), Southern (between 39% and 52%), Northwestern (40%) and Southwestern provinces (between 35% and 50%). The percentage of successful aging was largest in Hubei (a Central province) (54.69%) and smallest in Helongjiang (a Northeastern province) (27.34%).

4.1.4. Descriptive Statistics of Subjective Measures of Dependent Variable: As Happy as When Younger and Feeling as Useful as When Younger

4.1.4.1. As Happy as When Younger

Table 4.5 presents frequency distribution of the first subjective measure of dependent variable: As happy as when younger. As shown in Table 4.5, overall, approximately 39 percent of the respondents were identified as subjectively defined successful agers since they reported “often” or “always” feeling as happy as when they were younger.

Differences in the percentage distribution of subjectively defined successful agers among socio-demographic subgroups were also shown in Table 4.5. There was a significant difference between men and women. Men generally had a more positive perception of aging, with men having the higher percentage of “often” or “always” feeling as happy as when they were younger. Specifically, more than 40 percent of the men reported that they “often” or “always” felt as happy as when they were younger, while the percentage of “often” or “always” responses among women were about 35 percent.

There were also significant differences in happiness by education and occupation. Decreases in percentage of "always" or "often" responses were observed with each category of lower educational attainment. More than half of the respondents who had more than an elementary education reported that they always or often felt as happy as when they were younger, while the percentage of reporting "often" or "always" among respondents who had elementary education and those who never went to school was 42.73 percent and 35.37 percent, respectively. In terms of occupation, older people who were cadres or managers had a more positive perception of aging than other groups, with older people who were cadres or managers having higher percentages of "often" or "always" responses (51.69%) compared to non-agricultural workers (43.78%), those never formally employed (37.27%), and agricultural workers (34.83%).

There were slightly higher percentages of "often" and "always" responses among *Han* Chinese (38.48%) than minority respondents (36.89%). However, this difference was not statistically significant.

Table 4.6 and Figure 4.5 present the distribution of subjectively defined successful agers (as happy as when younger) on a province-by-province basis. As can be seen, the percentage of subjectively defined successful agers varied cross-provincially, ranged from 28.23 percent in Jiangxi (an Eastern province) to 72.73 percent in Tianjing (a Northern provincial –level municipality). Overall, the prevalence of "feeling as happy as when younger" was higher in Northern provinces (between 41.15% to 72.73%) and Southwestern Provinces (between 45.29% to 45.98%) than Southern Provinces (between 28.62% to 33.01%) and Northwestern province (40%).

4.1.4.2. Feeling as Useful as When Younger

In addition to assessing their happiness, the respondents were also asked about how they assessed their usefulness. Table 4.7 presents frequency distribution of the second subjective measure of dependent variable: feeling as useful as when younger. As shown in Table 4.7, overall, approximately 41 percent of the respondents they reported that they felt as useful as when they were younger.

Differences in the percentage distribution of "feeling as useful as when younger" among socio-demographic subgroups were also shown in Table 4.7. There was a significant difference between men and women. Men had a more positive perception of aging compared with women. More than 46 percent of the men reported that they felt as useful as when they were younger, while 37.28 percent of women reported the same attitude.

With respect to ethnic groups, minority respondents had a more positive view on aging compared with Han Chinese. Approximate 47 percent of minority respondents reported "feeling as useful as when younger, whereas 40.35 percent of Han Chinese reported that they felt as useful as when they were younger.

Significant differences were also observed across different education levels and occupation groups. People with more than an elementary education had the highest percentages of reporting feeling as useful as when younger (54.58%). Decreases in percentage of "feeling as useful as when younger" responses were observed with each category of lower educational attainment. Among respondents who had elementary education and those who never went to school, the percentage of reporting "feeling as useful as when younger" was 45.17 percent and 37.36 percent, respectively. In terms of occupation, older people who were cadres or managers had a more positive perception of

aging than other groups, with older people who were cadres or managers having higher percentages of "feeling as useful as when younger" responses (56.04%) compared to non-agricultural workers (48.01%), those never formally employed (37.91%), and agricultural workers (37.14%).

Table 4.8 presents the distribution of "feeling as useful as when younger" by province. Figure 4.6 graphically shows the distribution. As can be seen, the range of the percentage of reporting "feeling as useful as when younger" was from 31.07 percent in Hunan (a Central province) to 48.41 percent in Hebei (a Northern province). Overall, the prevalence of "feeling as useful as when younger" was higher in Southwestern provinces (between 47.49% to 48.29%) and Southern Provinces (between 44.29% to 46.95%) than Central Provinces (between 31.07% to 38.91%) and Northwestern province (31.90%).

4.2. Results of Multilevel Logistic Regression Analysis for the Objective Measure of Successful Aging

In this section, I assessed whether economic development, income inequality, and economic restructuring of the province in which older adults lived affected successful aging which was dichotomously measured modified from Rowe and Kahn's (1998) concept, after accounting for individual characteristics. I then evaluated whether these effects were moderated by individual SES.

These analyses were based on multilevel logistic regression models. In this section, I first discuss the unconditional model (null model). I then present findings from the series of multilevel models.

4.2.1 Unconditional Model (Null Model)

The first step was to fit a null or empty two-level model with only an intercept parameter and province effects. The null model, as shown in Table 4.9, had no control variables or predictors and was estimated using adaptive quadrature with 7 integration points for the dependent variable in this study. The equation for the null model was described in Equation 1. The intercept β_0 was shared by all 22 provinces and the random effect u_{0j} is specific to the province j. The random effect was assumed to follow a normal distribution with the expected value 0 and the variance σ^2_{u0} :

$$\text{Log}\,[p_{ij} / (1-p_{ij})] = \beta_0 + u_{0j}$$

(Equation 1)

The initial results of the null or unconditional model showed that the odds of successful aging varied significantly across provinces. The likelihood ratio statistic for testing the null hypothesis that $\sigma^2_{u0} = 0$ was 162.69. This test statistics corresponded to a p-value of less than 0.001, which provided evidence that the between-province variance was not zero.

The intraclass correlation coefficient (ICC) was calculated by using Equation 2 (Snijders & Bosker, 1999), whereas *p* is the ICC coefficient, τ_0^2 is the between province variance from level 2 and σ^2 is the level 1 variance that is fixed to the variance of a standard logistic distribution: $\sigma^2 = \pi^2/3 = 3.29$.

$$p = \tau_0^2 / [(\tau_0^2 + \sigma^2)]$$

(Equation 2)

The ICC of the model was 0.0833. This suggested that, on average, 8.33 percent of the unexplained variations in successful aging in this sample could be attributed to the province level. Although provinces accounted for little variability in successful aging

(about 8.33% of total variation), the greater than zero ICC for the dependent variables indicated that variations in the odds of successful aging was likely to be explained by differences in the provincial contexts rather than by individual level attributes only. Some scholars (e.g. Snijders & Bosker, 1999; Duncan & Raudenbush, 1999) also indicate that a low ICC does not preclude the existence of significant macro-level contextual predictors. The variance at each province-level was statistically significant and the -2 log likelihood test (chi-square=162.69, $p<0.001$) was significant indicating that the multilevel model improved upon the fit from a traditional logistic regression model, which further confirmed that multilevel modeling was the appropriate analyses to answer the research question and that the provincial contexts in which individuals were embedded did matter to older people's chances of aging successfully.

4.2.2 Multivariate Results: Individual Characteristics and Province Characteristics

Results from multilevel logistic regression models are reported in Table 4.10 and Table 4.11. Table 4.10 presents the main effects of individual characteristics and province characteristics. Table 4.11 adds cross-level interaction effects. Table 4.10 and Table 4.11 show coefficients and standard errors for each analysis. In this section, odds ratios were also calculated by exponentiating the coefficients from the regression models to make results more understandable.

Model 1 (shown in Table 4.10) estimated the fixed effects of all individual covariates, assuming that the effect of each individual factor on successful aging was the same across provinces (the slopes were fixed), but allowing the intercepts to vary across

provinces. Results from Model 1 (only individual-level variables) indicated that age, gender, education, primary lifetime occupation, health-related behaviors, and social supports were associated with successful aging.

The results showed that age was negatively associated with successful aging. Specifically, as age increased by one year, the odds of being a successful ager decreased by 10.42 percent (1-Exp (-.11)). With respect to gender, women were found to have significantly lower odds of aging successfully than men, with the odds of aging successfully been 25.92 percent lower (1-Exp(-.30)). The results, however, suggested that the odds of aging successfully were not significantly different for ethnicity.

Education was reported to have a strong positive impact on successful aging. Older adults with at least elementary education had significantly higher odds of successful aging than those without formal education. Specifically, elementary education and more than elementary education increased the odds of successfully aging by 36.34 percent (Exp(.31)-1) and 49.18 percent (Exp(.40)-1), respectively.

Significant differences in the odds of successful aging were also evident in primary lifetime occupation. Contrary to the hypothesis regarding SES that suggested that cadres or managers were more likely to age successfully, non-agricultural workers were more likely to age successfully as compared with cadres or managers. Specifically, for older adults who were non-agricultural workers or agricultural workers, the odds of aging successfully were 19.72 percent (Exp(.18)-1) higher than for those who were cadres or managers. While agricultural workers and those who were never formally employed were less likely to age successfully as compared with cadres or managers, the differences in the odds of successful aging among them were not significant.

As expected, health-related behaviors significantly affected the likelihood of successful aging. Physical exercise had a strong positive effect. Current exercisers had a 127 percent higher odds (Exp(.82)-1) of aging successfully than those who never pursued physical exercise. Former physical exercises, however, was not statistically significantly associated with successful aging. Although the associations between current alcohol consumption and smoking were not statistically significant, pervious health-risky behaviors did matter. Former drinkers had a 18.94 percent (1-Exp(-.21)) lower odds of being successful agers than those who never engaged in alcohol consumption.

In terms of living arrangements, non-institutional residences were protective. Living in a non-institutional setting, including living alone, living with either a spouse or children, and intergenerational co-residence were all positively associated with successful aging. Specifically, older adults who lived alone had 2.89 (Exp(1.06)) times the odds of aging successfully as those who lived in a nursing home, those who lived with a spouse had 2.34 (Exp(.84)) times, those living with children had 1.72 (Exp(.54)) times, and those lived with children and a spouse had 1.82 (Exp(.60)) times the odds of successful aging as compared with those lived in an nursing home. Living with others, however, did not have a significant relationship with successful aging.

Frequent sibling-visitation was also statistically significant and had a positive effect on successful aging. For older adults who had frequent sibling-visitation, the odds of aging successfully were 22.37 percent (Exp(.21)-1) higher than for those who did not. However, the effect of frequent child-visitation was not statistically significant.

In model 2, I added all three province-level variables including GDP per capita, income inequality, and proportion of non-state-sector employees. As shown in Table 4.10

Model 2, the coefficients of individual covariates changed little after the inclusion of province level predictors. The relationships between these individual characteristics and successful aging were remarkably consistent across model 1 and model 2.

According to Model 2, the results show that province context significantly affected individual's aging outcome. I hypothesized a positive relationship between economic development and successful aging. Indeed, the association was positive and significant. Older people lived in a province with higher GDP per capita were more likely to age successfully. Specifically, for every increase in a province's GDP per capita, the likelihood of older adults aging successfully increased by 4.08 percent (Exp(.04)-1), net of individual characteristics.

I first added the main effect term of income inequality only in the model. The positive sign of it suggested that income inequality was positively associated with successful aging (β =1.37, S.E.=.818, p<.01; results not shown in Table 4.10), which contradicted the original hypothesis that income inequality would negatively associated with successful aging . Considering the association between income inequality and successful aging might take a quadratic form, I added a squared term of income inequality into the model to explore the potential non-linear relationship. The significant LR test (p<.05) suggested that adding the squared term significantly improved the original model. Results showed the significant squared term, indicating that the association between income inequality and successful aging took a quadratic form. The positive sign of the main effect term and the negative sign of the squared term showed a concave relationship between successful aging and income inequality. In other words, the likelihood of aging successfully increased with income inequality at first and then

decreased with income inequality when inequality was above a certain level, which could be graphically explained in Figure 4.7.

The effect of economic ownership restructuring was contrary to the theoretical expectation that economic ownership restructuring was negatively associated with successful aging. The results showed that older people appeared to be more likely to age successfully in provinces with higher proportion of non-state-owned sector employees. For every increase in a province's proportion of non-state-sector employees, the likelihood of older adults aging successfully would increase by approximately 4 percent (Exp(.04)-1), net of individual characteristics.

To summarize, the results indicated that successful aging was shaped by individual socio-demographic characteristics, health-related behaviors, personal social supports, and province contexts. Specifically, the odds of aging successfully were greater for men, the young old, those with at least elementary education, those who were non-agricultural workers, those who exercised regularly, those who quit drinking, those who lived alone or with family members, those who had frequent sibling-visit, and those who lived in economically prosperous and more marketized provinces than for their respective counterparts.

4.2.3. Multivariate Results: Cross-level Interaction Effects

To determine whether the effect of market transition on the odds of aging successfully varied by individual SES, interaction terms between province-level market transition variables and individual SES variables (i.e. GDP per capita*education, GDP per capita*occupation, Income Inequality*education, Income Inequality*occupation, proportion of non-state-owned sector employees*education, and proportion of non-state-

owned sector employees *occupation) were added into the models. Each interaction term was examined in a separate model.

The results did not find significant interaction effects between "GDP per capita" and individual SES (results not shown), and "income inequality" and individual SES (results not shown). However, significant differential effects of economic ownership restructuring (measured by the proportion of non-state-owned sector employees) were evident by individual SES (education and primary lifetime occupation). Results of these analyses are displayed in Table 4.11. Model 3 in Table 4.11 includes interaction effects between individual-level education and province-level economic ownership restructuring. Model 4 in Table 4.11 includes interaction effects between individual-level primary lifetime occupation and province-level economic ownership restructuring.

Beginning with education, the interaction term for those with more than an elementary school education was significant ($p<0.05$), which means that the effect of economic ownership restructuring was different for those with more than an elementary school education than it was for those with no formal education. No significant differential effect was seen for those with elementary school education relative to those with no formal education.

To interpret the interaction, I plotted the predicted probabilities of successful aging for different education levels (Figure 4.8). Predicted probabilities were calculated by this formula:

$$\hat{\Pr} = \frac{e^{\hat{xb}}}{1+e^{\hat{xb}}} \qquad \text{(Equation 3)}$$

In calculating the predicted probabilities, all other variables were fixed at zero (reference group for categorical variables) or their means (continuous variables). Separate lines were plotted by different education levels.

Figure 4.8 shows a clear trend: for all education levels, the propensity to age successfully increases with the proportion of non-state-owned sector employees. Nonetheless, the extent of the increase differs by education levels. The rate of the increase is relatively lower for people with a higher education level (i.e. more than elementary education), as indicated by the flatter slope. Whereas the increase rate is largest for those who had no formal education, as indicated by the steepest slope. In other words, those who had no formal education benefited most during the economic ownership restructuring.

With respect to occupation, differential effects of economic ownership restructuring on the odds of aging successfully were statistically significant for those never formally employed relative to those cadres or managers. The interaction effects are graphically displayed in Figure 4.9. Predicted probabilities of successful aging for different occupation categories were also calculated using Equation 3. Separate lines were plotted by different occupation categories.

As shown in Figure 4.9, the general pattern for different occupational categories suggested that successful aging increased with the proportion of non-state-owned sector employees. This association was particularly pronounced for individuals who were never formally employed, as indicated by the steeper slope. Those cadres and managers, however, had the lowest increase rates. In other words, cadres and managers benefited least during the economic ownership restructuring.

To summarize, the effects of economic ownership restructuring on the odds of aging successfully varied by education and occupation. More specifically, economic ownership restructuring was associated with a better chance of successful aging for the full sample, but the increase rates were highest for those had no formal education or those who were never formally employed, while those who had more than elementary education or those who were cadres or managers had the lowest increase rates. In other words, low SES older people benefited more from economic ownership restructuring in terms of successful aging than high SES older adults.

4.3. Results of Multilevel Logistic Regression Analysis for the Subjective Measure of Successful Aging: As Happy as When Younger

This section presents results from the multilevel logistic models predicting a subjective measure of successful aging. I assessed whether economic development, income inequality, and economic restructuring of the province in which older adults lived affected whether they felt as happy as when they were younger, after accounting for individual characteristics. I also examined the interaction effects between province-level market transition and individual SES on subjective successful aging.

I start with a null-model, which only includes an intercept parameter and province effects, to see whether the use of multilevel models is essential. The results of the null model, shown in Table 4.12, revealed statistically significant variation in subjective perception of happiness across provinces (τ_0^2 =.136, p<0.001). The intraclass correlation coefficient (ICC), calculated by using Equation 2 from section 4.2.1, of the model was 0.0408, which suggested that, on average, 4.08 percent of the variance in happiness could

be attributed to the province level. While most of the variability in happiness is at the individual level, a greater-than-zero ICC implies the usefulness of the multilevel techniques, as the variations in dependent variable cannot be explained by individual level attributes alone. The variance at each province-level was statistically significant and the -2 log likelihood test (Chi-square=172.81, $p<.001$) indicated that the multilevel model improved upon the fit from a traditional logistic regression model.

4.3.1 Multivariate Results: Individual Characteristics and Province Characteristics

Results from multilevel logistic regression models for happiness are reported in Table 4.13 and Table 4.14. Table 4.13 presents the main effects of individual characteristics and province characteristics. Table 4.14 adds cross-level interaction effects.

Model 1 (shown in Table 4.13) estimated the fixed effects of all individual-level variables, assuming that the effect of each individual factor on subjective perception of happiness was the same across provinces (the slopes were fixed), but allowing the intercepts to vary across provinces. As reported in Model 1 of Table 4.13, ethnic minority, education, primary lifetime occupation, physical exercises, and social supports were significantly associated with subjective perception of happiness.

It can be seen from Table 4.13, ethnic minority was found to have significantly higher odds of feeling happy than ethnic majority (Han Chinese), with the odds of feeling happy been 43.33 percent higher (Exp(.36)-1). Unlike the objective measure of successful aging, the results suggested that the odds of being subjectively defined successful agers

(i.e. feeling as happy as when younger) were not significantly different either for age or for gender.

Education was significantly associated with subjective perception of happiness. Older people with at least an elementary education had significantly higher odds of feeling happy than those without formal education. Specifically, older people with elementary education had 17.35 percent higher odds of feeling as happy as when they were younger compared with those with no formal education (Exp(.16)-1). Older people with more than elementary education had 33..64 percent higher odds of feeling as happy as when they were younger compared with those who had no formal education (Exp(.29)-1).

In terms of occupation, agricultural workers were less likely to feel as happy as when younger compared with cadres or managers. Specifically, agricultural workers had a 13.93 percent (1-Exp(-.29)) decrease in odds of feeling as happy as when they were younger compared to cadres or managers. However, non-agricultural workers and those who never formally employed older people did not differ significantly from cadres or managers.

Few health-related behaviors were significantly associated with subjective perception of happiness. Doing exercises, either formerly or currently, was the only behavioral factor significantly associated with the dependent variable. Specifically, those current exercisers had 80.40 percent higher odds (Exp(.59)-1) of reporting feeling as happy as when younger than those who never pursued physical exercises. And former exercisers had 16.18 percent higher odds (Exp(.15)-1) of reporting feeling as happy as when younger than those who never pursued physical exercises.

Living arrangements were significantly associated with subjective perception of happiness, with those living alone having a decreased chance of feeling as happy as when younger. The odds of feeling as happy as when younger were 21.34 percent lower for respondents who lived alone compared with those lived in nursing homes (1-Exp(-.24)). Other living arrangements did not differ significantly from living in the institutions. In addition, older adults who had frequent child-visits had 18.53 percent higher odds of feeling as happy as when younger relative to their counterparts who did not have frequent child-visit (Exp(.17)-1).

In model 2, I added all three province-level variables including GDP per capita, income inequality, and proportion of non-state-sector employees. As shown in Table 4.13 Model 2, the coefficients of individual covariates basically unchanged after the inclusion of province level predictors. According to Model 2, although all of the three province-level variables – economic development (GDP per capita), income inequality, and economic ownership restructuring – were positive, indicating somewhat GDP per capita, income inequality, and economic ownership restructuring were associated with an increased probability of subjective perception of happiness, the results were not statistically significant.

To summarize, the results indicated that subjective perception of happiness was only associated with individual-level factors including ethnic groups, individual SES, physical exercises, and individual social support. The economic development, income inequality and economic ownership restructuring of the province where older people lived were not associated with subjective perception of happiness. Specifically, having an occupation as an agricultural worker and living alone reduced the likelihood of feeling as

happy as when younger compared with their respective counterparts. While being an ethnic minority older adults, having at least an elementary education, being involved in regular exercises, and having frequent child-visits increased the likelihood of feeling as happy as when younger compared with their respective counterparts.

4.3.2. Multivariate Results: Cross-level Interaction Effects

I additionally examined whether there were significant interaction effects between province-level market transition variables and individual SES variables for prediction of subjective perception of happiness. I added six possible interaction terms (i.e. GDP per capita*education, GDP per capita*occupation, Income Inequality*education, Income Inequality*occupation, proportion of non-state-owned sector employees*education, and proportion of non-state-owned sector employees *occupation) into the models. Each interaction term was examined in a separate model. Only the interaction term between proportion of non-state-owned sector employees and occupation was found statistically significant, which was reported in Model 3 in Table 4.14.

Results showed that differential effects of economic ownership restructuring on subjective perception of happiness were statistically significant for agricultural workers ($p<.05$) relative to those cadres or managers. The interaction effects are graphically displayed in Figure 4.10. Predicted probabilities were calculated by using Equation 3 in Section 4.2.3. All other variables were fixed at zero (reference group for categorical variables) or their means (continuous variables). Separate lines were plotted by different occupation categories.

As shown in Figure 4.10, although the predicted probability of subjective perception of happiness for all sample increased as the proportion of non-state-owned

sector employees increased, those agricultural workers had the largest increasing rate, as indicated by the steepest slope. Whereas cadres and managers had the lowest increasing rate, as indicated by the flatter slope. In other words, agricultural workers benefited most during economic ownership restructuring.

4.4. Results of Multilevel Logistic Regression Analysis for the Subjective Measure of Successful Aging: Feeling as Useful as When Younger

This section presents results from the multilevel logistic models predicting the second subjective measure of successful aging: feeling as useful as when younger. I assessed whether economic development, income inequality, and economic restructuring of the province in which older adults lived affected their perception of feeling useless with age, after accounting for individual characteristics. I also examined the interaction effects between province-level market transition and individual SES on subjective successful aging.

Like previous analyses, I start with a null-model, which only includes an intercept parameter and province effects, to see whether the use of multilevel models is essential. The results of the null model, shown in Table 4.15, revealed statistically significant variation in subjective perception of feeling useless with age across provinces (τ_0^2 =0.049, $p<0.001$). The intraclass correlation coefficient (ICC), calculated by using Equation 2 from section 4.2.1, of the model was 0.0146, which suggested that, on average, 1.46 percent of the variance in feeling as useful as when younger could be attributed to the province level. Although most of the variability in happiness is at the individual level, a greater-than-zero ICC implies the usefulness of the multilevel

techniques, as the variations in dependent variable cannot be explained by individual level attributes alone. The variance at each province-level was statistically significant and the -2 log likelihood test (Chi-square=88.28, $p<.001$) indicated that the multilevel model improved upon the fit from a traditional logistic regression model.

4.4.1 Multivariate Results: Individual Characteristics and Province Characteristics

Results from multilevel ordered logistic regression models for feeling as useful as when younger are reported in Table 4.16 and Table 4.17. Table 4.16 presents the main effects of individual characteristics and province characteristics. Table 4.17 adds cross-level interaction effects.

Model 1 (shown in Table 4.16) estimated the fixed effects of all individual-level variables, assuming that the effect of each individual factor on subjective perception of feeling as useful as when younger was the same across provinces (the slopes were fixed), but allowing the intercepts to vary across provinces. As reported in Model 1 of Table 4.16, gender, education, primary lifetime occupation, health-related behaviors, and social supports were significantly associated with subjective perception of feeling as useful as when younger.

As indicated in Table 4.16, female was found to have significantly lower odds of feeling as useful as when younger than being male, with the odds of feeling useful been 13.06 percent lower (1-Exp(-.14)).

Education was significantly associated with subjective perception of feeling useful. The positive estimated coefficients suggested that having more than an elementary education increased the chance of feeling as useful as when younger. Specifically, older

people with more than an elementary education had 20.92 percent higher odds of feeling as useful as when younger compared with those had no formal education (Exp(.19)-1).

Occupation was significantly associated with subjective perception of feeling useful. Workers, either non-agricultural workers or agricultural workers, and those who were never formally employed were less likely to feel as useful as when younger compared with cadres or managers. Specifically, non-agricultural workers, agricultural workers, and those never formally employed had a 16.47 percent (1-Exp(-.18)), 37.50 percent (1-Exp(-.47)), and 27.39 percent (1-Exp(-.32)), respectively, decrease in odds of feeling as useful as when younger compared to cadres or managers.

Health-related behaviors were significantly associated with subjective perception of usefulness. Currently doing exercises was positively associated with feeling useful. Specifically, those currently exercising a had 60 percent higher odds (Exp(.47)-1) of reporting feeling as useful as when younger compared with those who never pursued physical exercises. Those who were former drinkers had an 11.31 percent decrease in odds of reporting feeling as useful as when younger compared with those who never consumed alcohol (1-Exp(-.12)).

Living arrangements were significantly associated with feeling useful, with living with a spouse having an increased chance of reporting feeling as useful as when younger. The coefficients indicated that the odds of feeling as useful as when younger were 28.40 percent higher for respondents who lived with a spouse (Exp(.25)-1) compared with those who lived in nursing homes.

In model 2, I added all three province-level variables including GDP per capita, income inequality, and proportion of non-state-sector employees. As shown in Table 4.16

Model 2, the coefficients of all three province-level variables were positive, indicating somewhat GDP per capita, income inequality, and economic ownership restructuring associated with an increased probability of feeling as useful as when younger, but again fell short of statistical significance.

To summarize, the results indicated that subjective perception of usefulness was only associated with individual-level factors including gender, individual SES, health-related behaviors, and individual social support. The economic development, income inequality and economic ownership restructuring of the province where older people lived were not associated with subjective perception of usefulness. Specifically, being female, having an occupation other than cadres or managers, and being a former drinker reduced the likelihood of feeling as useful as when younger compared with their respective counterparts. While having more than an elementary education, being involved in regular exercises, and living with a spouse increased the likelihood of feeling as useful as when younger compared with their respective counterparts.

4.4.2. Multivariate Results: Cross-level Interaction Effects

I also examined whether there were significant interaction effects between province-level market transition variables and individual SES variables for prediction of subjective perception of usefulness. I added six possible interaction terms (i.e. GDP per capita*education, GDP per capita*occupation, Income Inequality*education, Income Inequality*occupation, proportion of non-state-owned sector employees*education, and proportion of non-state-owned sector employees *occupation) into the models. Each interaction term was examined in a separate model. The only statistically significant

interaction term was between GDP per capita and occupation, which was reported in Model 3 in Table 4.17.

Results showed that differential effects of economic development on subjective perception of usefulness were statistically significant for agricultural workers ($p<.05$) and those who never formally employed ($p<.05$) relative to those cadres or managers. The interaction effects are graphically displayed in Figure 4.11. Predicted probabilities were calculated by using Equation 3 from Section 4.2.3. All other variables were fixed at zero (reference group for categorical variables) or their means (continuous variables). Separate lines were plotted by different occupation categories.

As shown in Figure 4.11, although the predicted probability of feeling as useful as when younger for all sample increased as GDP per capita increased, agricultural workers and those never formally employed had much larger increasing rates, as indicated by the much steeper slopes, than cadres and managers.

In other words, agricultural workers and those never formally employed benefited more than cadres and managers from economic development.

Table 4.1 Descriptive Statistics of Individual-level Independent Variables

Total number of respondents: N=11199		
	N /Mean	% / SD
Individual-level independent variables		
Female	6548	58.47%
Age	91.3	7.57
Ethnic Group		
Minority	694	6.2%
Han Chinese	10505	93.8%
Education		
None	7192	64.22%
Elementary (<=6 years)	3034	27.09%
More than elementary (>6 years)	973	8.69%
Primary Lifetime Occupation		
Cadres or Managers	919	8.21%
Non-agricultural workers	2033	18.15%
Agricultural workers	5797	51.76%
Never formally employed	2450	21.88%
Smoke		
Never	7349	65.62%
Former	1984	17.72%
Current	1866	16.66%
Alcohol Consumption		
Never	7277	64.98%
Former	1680	15.00%
Current	2242	20.02%
Exercise		
Never	5994	53.52%
Former	1507	13.46%
Current	3698	33.02%
Living Arrangements		
Living in a nursing home	784	7.00%
Living alone	1330	11.88%
Living with spouse only	1102	9.84%
Living with children only	6886	61.49%
Living with children and spouse	891	7.96%
Living with others only	206	1.84%
Have frequent sibling-visit	1982	17.70%
Have frequent child-visit	8212	73.33%

Table 4.2 Descriptive Statistics of Province-level Independent Variables

Number of total provinces: n=22				
	Mean	SD	Minimum	Maximum
GDP Per capita (Chinese *Yuan*)	9616.21	6.53	4318.81	34546.98
Income inequality	.9987	0.11	.7519	1.1647
% of non-state-sector employees	37.94%	13.69	20%	65%

Figure 4.1 GDP per capita, by provinces, 2000

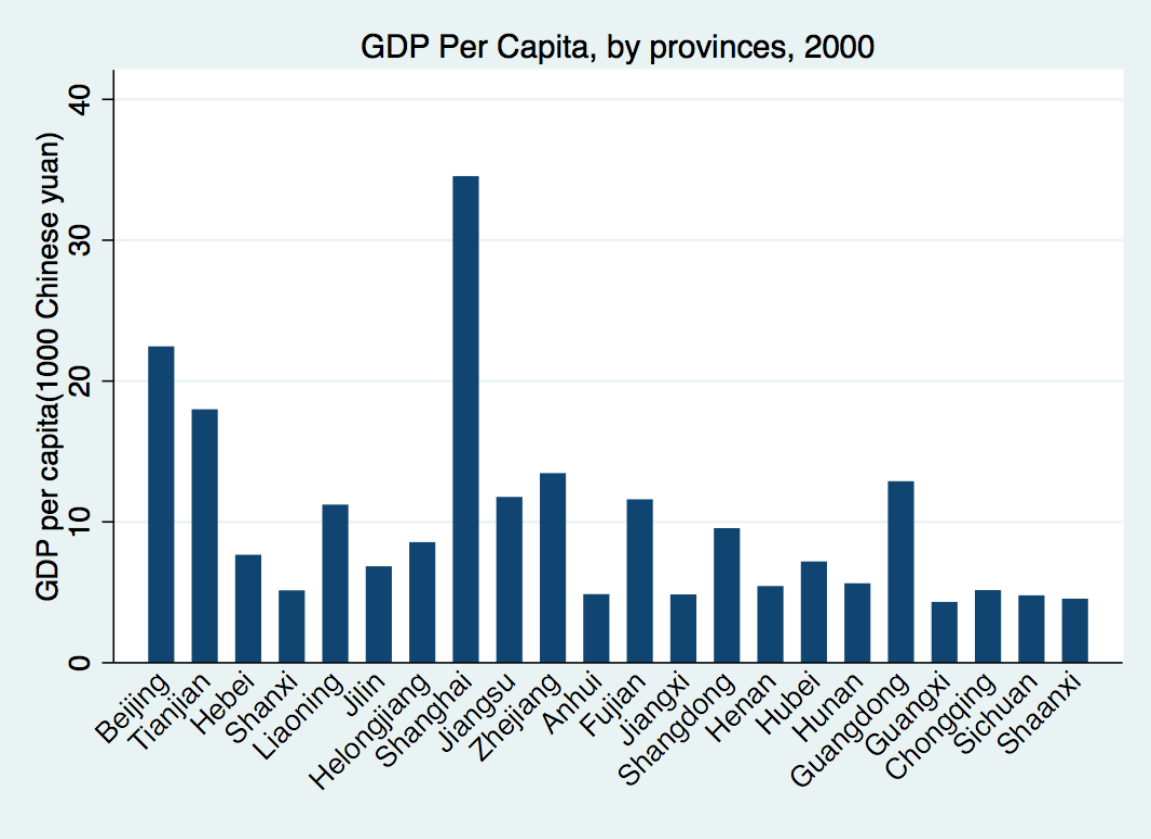


Figure 4.2 Income Inequality, by provinces, 2000

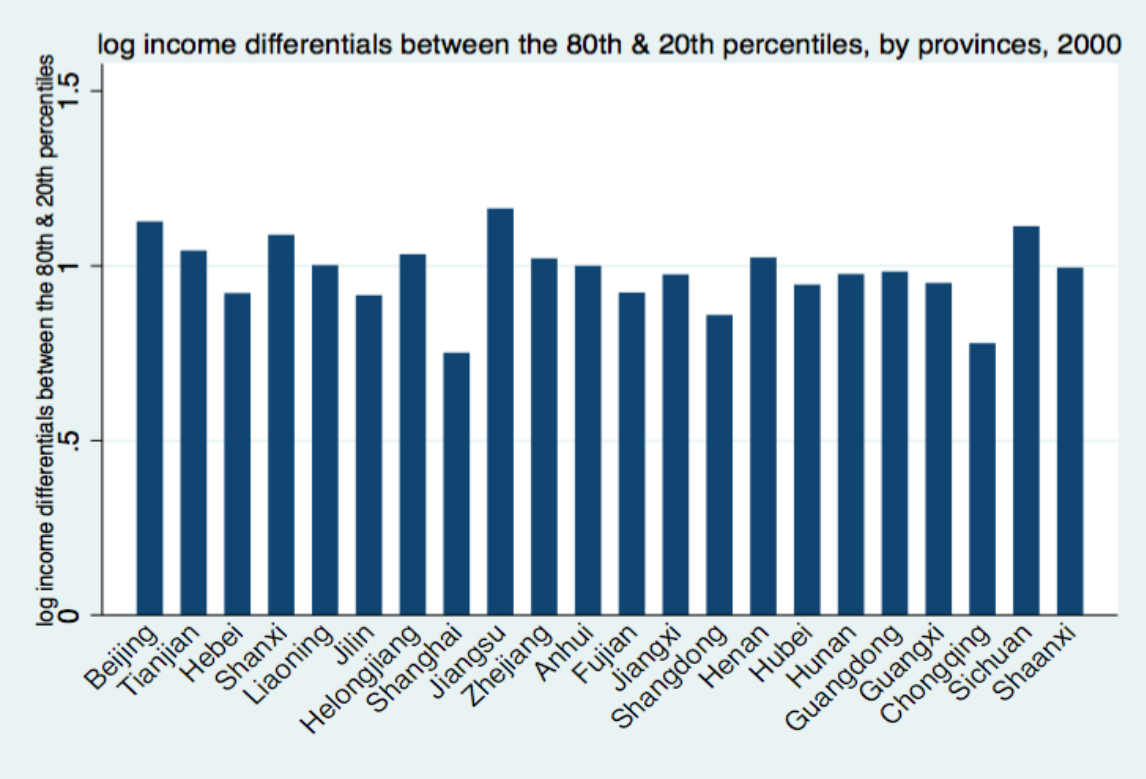


Figure 4.3 Proportion of Employment in Non-state-owned Sectors, by provinces, 2000

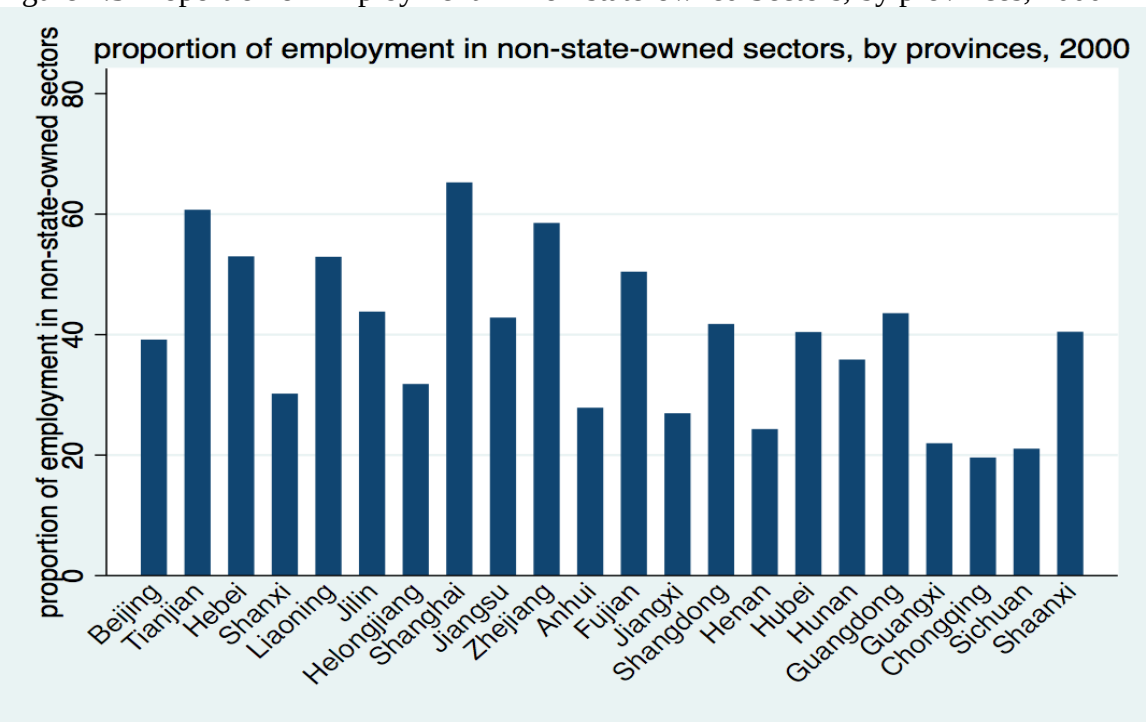


Table 4.3 Frequency Distribution of Objective Measure of Successful Aging

	N	%
All Cases (n=11199)	4979	44.46%
Gender [a]		
Female (n=6548)	2336	35.68%
Male (n=4651)	2643	56.83%
Ethnic Group		
Minority (n=694)	329	47.41%
Han Chinese (n=10505)	4650	44.26%
Education [b]		
None (n=7192)	2653	36.89%
Elementary (<=6 years) (n=3034)	1719	56.66%
More than elementary (>6 years) (n=973)	607	62.38%
Primary Lifetime Occupation [c]		
Cadres or Managers (n=919)	560	60.94%
Non-agricultural workers (n=2033)	1126	55.39%
Agricultural workers (n=5797)	2480	42.78%
Never formally employed (n=2450)	813	33.18%

[a] Difference in percentage of successful agers between female and male significant at $p<0.001$

[b] Difference in percentage of successful agers among different education levels significant at $p<0.001$

[c] Difference in percentage of successful agers among different occupations significant at $p<0.001$

Table 4.4 Frequency Distribution of Objective Measure of Successful Aging by Provinces

	Total No. of cases in province	No. of Successful Agers	%
(Northern Provinces)			
Bejing	226	67	29.65%
Tianjing	121	52	42.98%
Hebei	126	53	42.06%
Shanxi	120	50	41.67%
(Northeastern Provinces)			
Liaoning	437	158	36.16%
Jilin	270	93	34.44%
Heilongjiang	256	70	27.34%
(Eastern Provinces)			
Shanghai	454	171	37.67%
Jiangsu	1338	649	48.51%
Zhejiang	942	425	45.12%
Anhui	596	287	48.15%
Fujian	500	270	54.00%
Jiangxi	209	103	49.28%
Shandong	473	168	35.52%
(Central Provinces)			
Henan	460	155	33.70%
Hubei	426	233	54.69%
Hunan	383	171	44.65%
(Southern Provinces)			
Guangdong	727	290	39.89%
Guangxi	1359	702	51.66%
(Southwestern Provinces)			
Sichuan	1168	585	50.09%
Chongqing	398	143	35.93%
(Northwestern Province)			
Shaanxi	210	84	40.00%
Total	11199	4979	44.46%

Figure 4.4 Distribution of Objective Measure of Successful Aging by Provinces

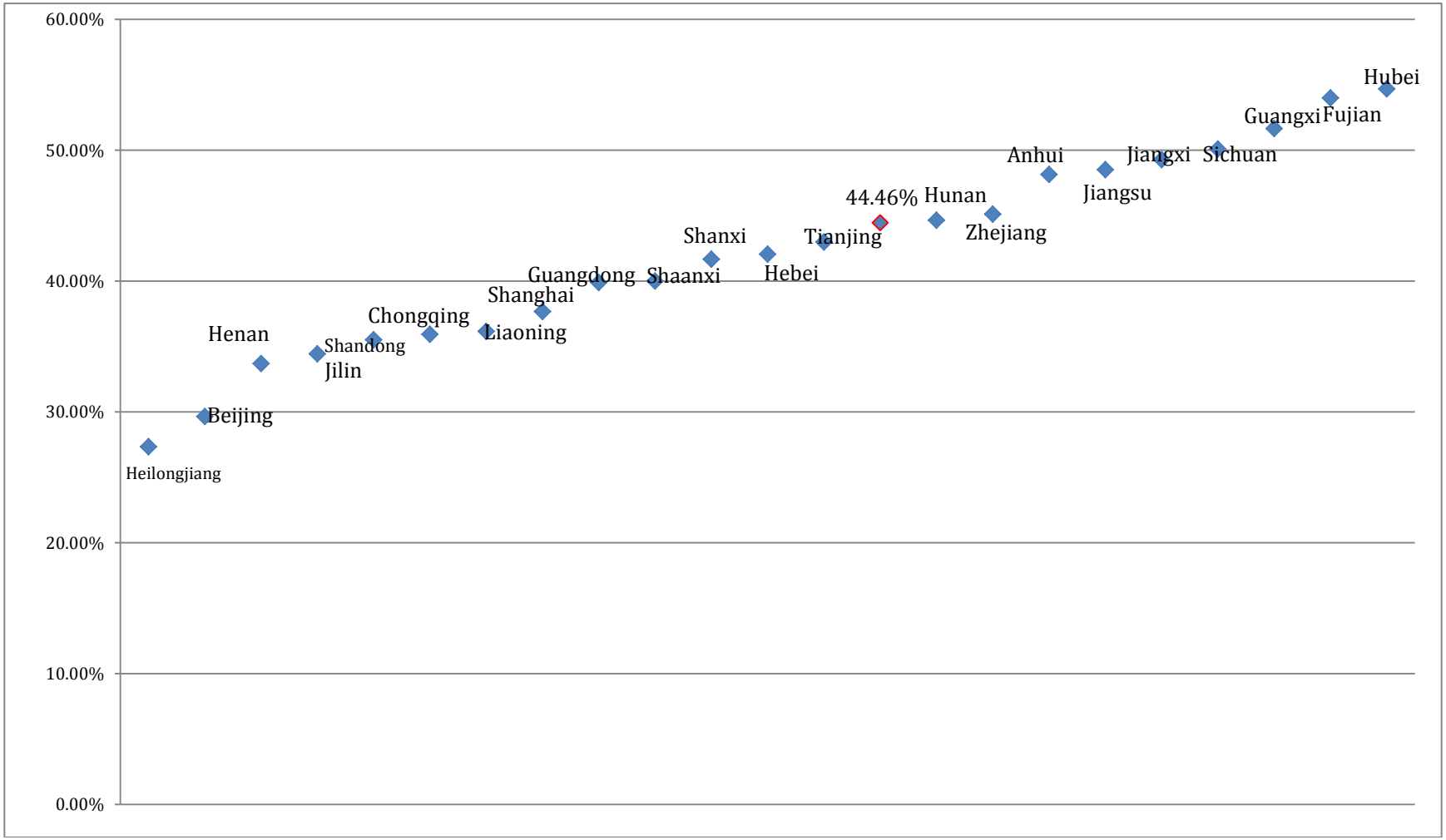


Table 4.5 Frequency Distribution of Subjective Measure of Successful Aging: As Happy as When Younger

	N	%
All Cases (n=11199)	4316	38.54%
Gender [a]		
Female (n=6548)	2333	35.64%
Male (n=4651)	1982	42.63%
Ethnic Group		
Minority (n=694)	256	36.89%
Han Chinese (n=10505)	4042	38.48%
Education [b]		
None (n=7192)	2545	35.37%
Elementary (n=3034)	1296	42.73%
More than elementary (n=973)	494	50.83%
Primary Lifetime Occupation [c]		
Cadres or Managers (n=919)	475	51.69%
Non-agricultural workers (n=2033)	890	43.78%
Agricultural workers (n=5797)	2019	34.83%
Never formally employed (n=2450)	913	37.27%

[a] Difference in percentage of successful agers between female and male significant at $p<0.001$

[b] Difference in percentage of successful agers among different education levels significant at $p<0.001$

[c] Difference in percentage of successful agers among different occupations significant at $p<0.001$

Table 4.6 Descriptive Statistics of Subjective Measure of Successful Aging (As Happy as When Younger**:** 1=Yes; 0=No), by provinces

	Total number of cases in province	number. of subjectively defined successful ager	%
(Northern Provinces)			
Bejing	226	93	41.15%
Tianjing	121	88	72.73%
Hebei	126	59	46.83%
Shanxi	120	63	52.50%
(Northeastern Provinces)			
Liaoning	437	166	37.99%
Jilin	270	112	41.48%
Heilongjiang	256	104	40.63%
(Eastern Provinces)			
Shanghai	454	206	45.37%
Jiangsu	1338	539	40.28%
Zhejiang	942	318	33.76%
Anhui	596	219	36.74%
Fujian	500	182	36.40%
Jiangxi	209	59	28.23%
Shandong	473	200	42.28%
(Central Provinces)			
Henan	460	214	46.52%
Hubei	426	143	33.57%
Hunan	383	146	38.12%
(Southern Provinces)			
Guangdong	727	240	33.01%
Guangxi	1359	389	28.62%
(Southwestern Provinces)			
Sichuan	1168	529	45.29%
Chongqing	398	183	45.98%
(Northwestern Province)			
Shaanxi	210	64	30.48%
Total	11199	4316	38.54%

Figure 4.5 Distribution of Subjective Measure of Successful aging (As Happy as When Younger), by province

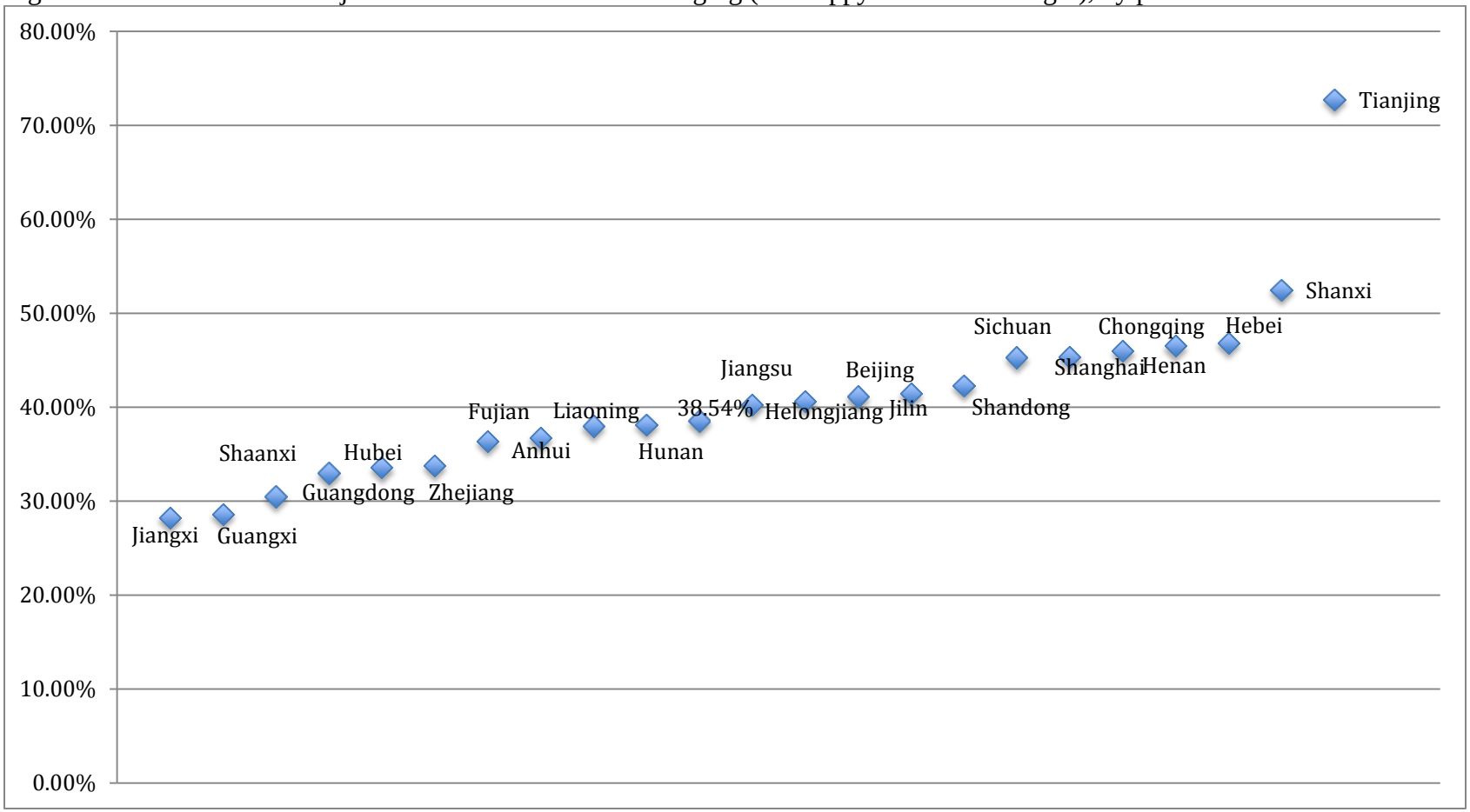


Table 4.7 Frequency Distribution of Subjective Measure of Successful Aging: Feeling as useful as when younger

	N	%
All Cases (n=11199)	4601	41.07%
Gender [a]		
Female (n=6548)	2441	37.28%
Male (n=4651)	2159	46.41%
Ethnic Group [b]		
Minority (n=694)	325	46.83%
Han Chinese (n=10505)	4238	40.35%
Education [c]		
None (n=7192)	2687	37.36%
Elementary (n=3034)	1370	45.17%
More than elementary (n=973)	531	54.58%
Primary Lifetime Occupation [d]		
Cadres or Managers (n=919)	515	56.04%
Non-agricultural workers (n=2033)	976	48.01%
Agricultural workers (n=5797)	2153	37.14%
Never formally employed (n=2450)	929	37.91%

[a] Difference in percentage of successful agers between female and male significant at $p<0.001$

[b] Difference in percentage of successful agers between ethnic minority and ethnic majority (Han Chinese) significant at $p<0.001$

[c] Difference in percentage of successful agers among different education levels significant at $p<0.001$

[d] Difference in percentage of successful agers among different occupations significant at $p<0.001$

Table 4.8 Descriptive Statistics of Subjective Measure of Successful Aging (Feeling as useful as when younger**:** 1=Yes; 0=No), by provinces

	Total number of cases in province	number. of subjectively defined successful ager	%
(Northern Provinces)			
Bejing	226	95	42.04%
Tianjing	121	45	37.19%
Hebei	126	61	48.41%
Shanxi	120	53	44.17%
(Northeastern Provinces)			
Liaoning	437	171	39.13%
Jilin	270	109	40.37%
Heilongjiang	256	114	44.53%
(Eastern Provinces)			
Shanghai	454	210	46.26%
Jiangsu	1338	510	38.12%
Zhejiang	942	360	38.22%
Anhui	596	215	36.07%
Fujian	500	185	37.00%
Jiangxi	209	68	32.54%
Shandong	473	191	40.38%
(Central Provinces)			
Henan	460	179	38.91%
Hubei	426	136	31.92%
Hunan	383	119	31.07%
(Southern Provinces)			
Guangdong	727	322	44.29%
Guangxi	1359	638	46.95%
(Southwestern Provinces)			
Sichuan	1168	564	48.29%
Chongqing	398	189	47.49%
(Northwestern Province)			
Shaanxi	210	67	31.90%
Total	11199	4601	41.07%

Figure 4.6 Distribution of Subjective Measure of Successful aging (Feeling as useful as when younger), by province

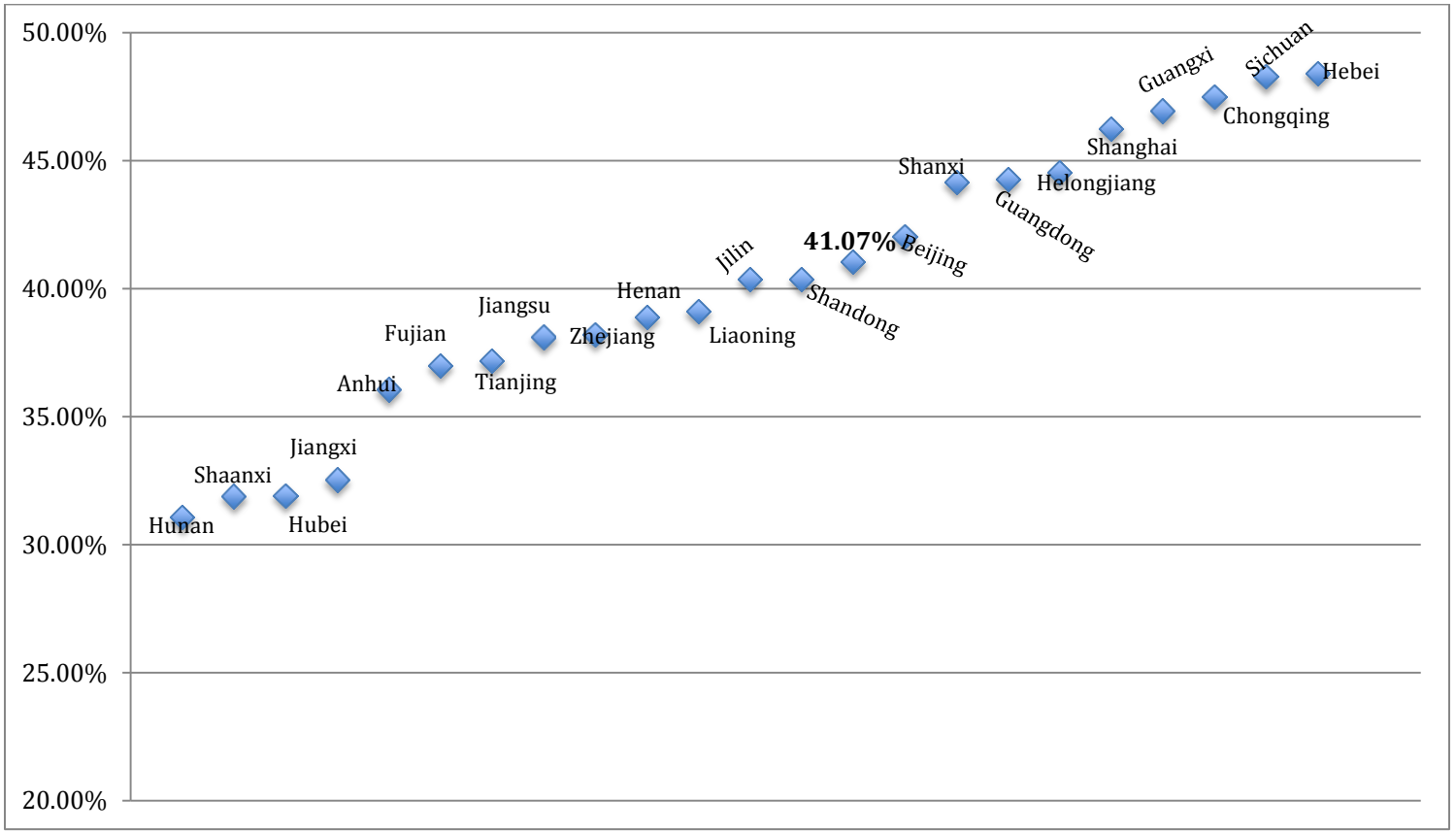


Table 4.9: Estimation of Unconditional Model (Objective Measure of Successful Aging)

Fixed Effect	*B (SE)*
Intercept	-.325 (.068) ***
Random Effect	
Level 2(province) variance	.299 (.051) ***
LR Test: chibar2(01)	162.69 ***
ICC	.0833
LL	-7612.5334
N	11199
*** p<0.001	

Table 4.10. Random Intercept Multilevel Logistic Regression Estimates of Objective Measure of Successful Aging

	Model 1	Model 2
Individual-level variables	Coefficient (S.E.)	Coefficient (S.E.)
Age	–.11 (.004)***	–.11 (.004)***
Female	–.30 (.062)***	–.30 (.062)***
Ethnic Minority	.13 (.100)	.15 (.101)
Education		
None	---	---
Elementary	.31 (.058)***	.31 (.058)***
More than Elementary	.40 (.097)***	.40 (.097)***
Primary Lifetime Occupation		
Cadres or Managers	---	---
Non-agricultural workers	.18 (.100)*	.18 (.100)*
Agricultural workers	–.05 (.098)	–.06 (.098)
Never employed	–.14 (.106)	–.15 (.107)
Exercise		
Never	---	---
Former	–.24 (.071)	–.24(.071)
Current	.82 (.052)***	.82 (.052)***
Smoke		
Never	---	---
Former	–.04(.065)	–.04 (.065)
Current	.10 (.066)	.10 (.067)
Alcohol Consumption		
Never	---	---
Former	–.21 (.067)**	–.21 (.067)**
Current	.12 (.060)	.12 (.060)
Living Arrangements		
Living in a nursing home	---	---
Living alone	1.06 (.107)***	1.05 (.107)***
Living with spouse only	.84 (.112)***	.84 (.112)***
Living with children only	.54 (.092)***	.54 (.092)***
Living with children and spouse	.60 (.115)***	.60 (.115)***
Living with others only	.35 (.186)	.35 (.186)
Have frequent sibling-visit	.21 (.058)***	.21 (.058)***
Have frequent child-visit	.07 (.052)	.07 (.052)
Province-level variables		
GDP per capita		.04 (.017)**
Income inequality		1.21 (.899)*
Income inequality squared		–2.74 (6.41)*
Proportion of non-state-sector employees		.04 (.010)***
Constant	–1.32 (.172)***	–1.13 (.172)***
Variance province level (estimates and s.e.)	.46 (.076)***	.33 (.057)***
Intra class correlation (%)	12.3	9.2
N individuals	11199	11199
N provinces	22	22

*p<.05, **p<.01, ***p<.001

Figure 4.7 Effect of Income Inequality on Objective Measure of Successful Aging

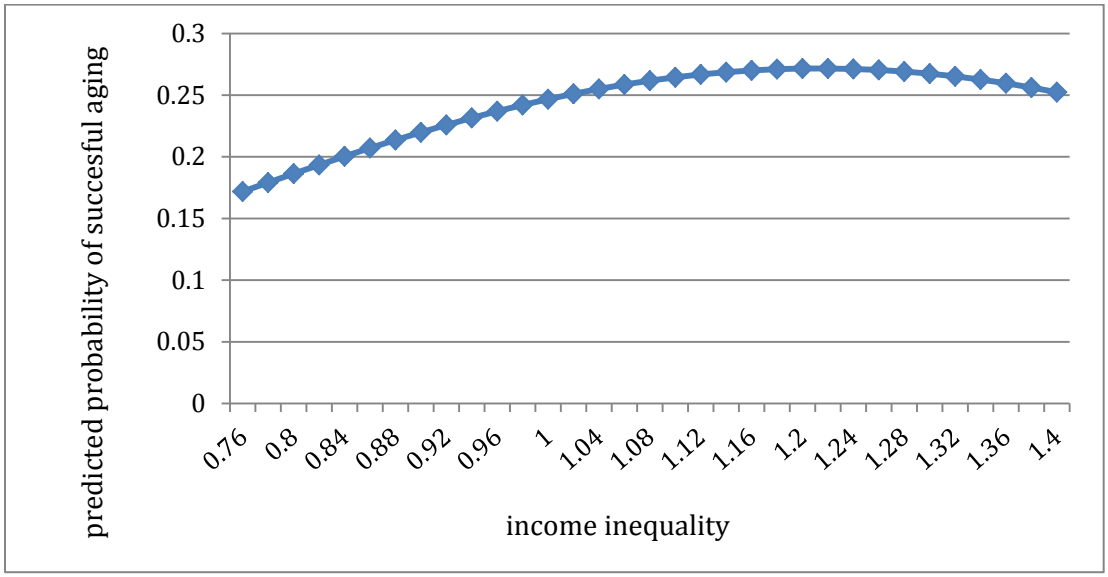


Table 4.11. Random Intercept Multilevel Logistic Regression Estimates of Objective Measure of Successful Aging, with Interaction Effects

	Model 3	Model 4
Individual-level variables	Coefficient (S.E.)	Coefficient (S.E.)
Age	–.11 (.004)***	–.11 (.004)***
Female	–.30 (.061)***	–.30 (.062)***
Ethnic Minority	.14 (.101)	.15 (.101)
Education		
None	---	---
Elementary	.31 (.058)***	.31 (.058)***
More than Elementary	.41 (.098)***	.40 (.097)***
Primary Lifetime Occupation		
Cadres or Managers	---	---
Non-agricultural workers	.18 (.100)*	.19 (.100)*
Agricultural workers	–.05 (.098)**	–.04 (.099)**
Never employed	–.14 (.107)	–.13 (.108)*
Exercise		
Never	---	---
Former	–.23 (.071)	–.24 (.071)
Current	.82(.052)***	.82 (.052)***
Smoke		
Never	---	---
Former	–.03(.065)	–.03 (.065)
Current	.10 (.067)	.10 (.067)
Alcohol Consumption		
Never	---	---
Former	–.21 (.067)**	–.21 (.067)**
Current	.11 (.060)	.12 (.060)
Living Arrangements		
Living in a nursing home	---	---
Living alone	1.05 (.107)***	1.05 (.107)***
Living with spouse only	.85 (.112)***	.84 (.112)***
Living with children only	.55 (.092)***	.54 (.092)***
Living with children and spouse	.60 (.115)***	.60 (.115)***
Living with others only	.35 (.186)	.35 (.186)
Have frequent sibling-visit	.21 (.058)***	.21 (.058)***
Have frequent child-visit	.07 (.052)	.07 (.052)
Province-level variables		
GDP per capita	.04 (.017)**	.04 (.017)**
Income inequality	1.21 (.901)*	1.20 (.896)*
Income inequality squared	–2.74 (6.42)*	–2.74 (6.39)*
Proportion of non-state-sector employees	.05 (.011)***	.04 (.012)**
Cross-level interaction terms		
Non-Edu * Proportion of non-state-sector employees	---	
Elementary edu * Proportion of non-state-sector employees	–.01 (.006)	
More than elementary * Proportion of non-state-sector employees	–.02 (.008)*	

Table 4.11. Random Intercept Multilevel Logistic Regression Estimates of Objective Measure of Successful Aging, with Interaction Effects (Cont.)

	Model 3	Model 4
	Coefficient (S.E.)	Coefficient (S.E.)
Cross-level interaction terms		
Cadres/ Managers * Proportion of non-state-sector employees		---
Non-agricultural workers * Proportion of non-state-sector employees		.010 (.009)
Agricultural workers * Proportion of non-state-sector employees		.003 (.008)
Never employed * Proportion of non-state-sector employees		.012 (.009)*
Constant	–1.14 (.172)***	–1.15 (.172)***
Variance province level (estimates and s.e.)	.33 (.057)***	.33 (.056)***
Intra class correlation (%)	9.19	9.12
N individuals	11199	11199
N provinces	22	22

*p<.05, **p<.01, ***p<.001

Figure 4.8 Predicted Probabilities of Objective Measure of Successful Aging by Proportion of Non-State-Owned Employees and Different Education Levels

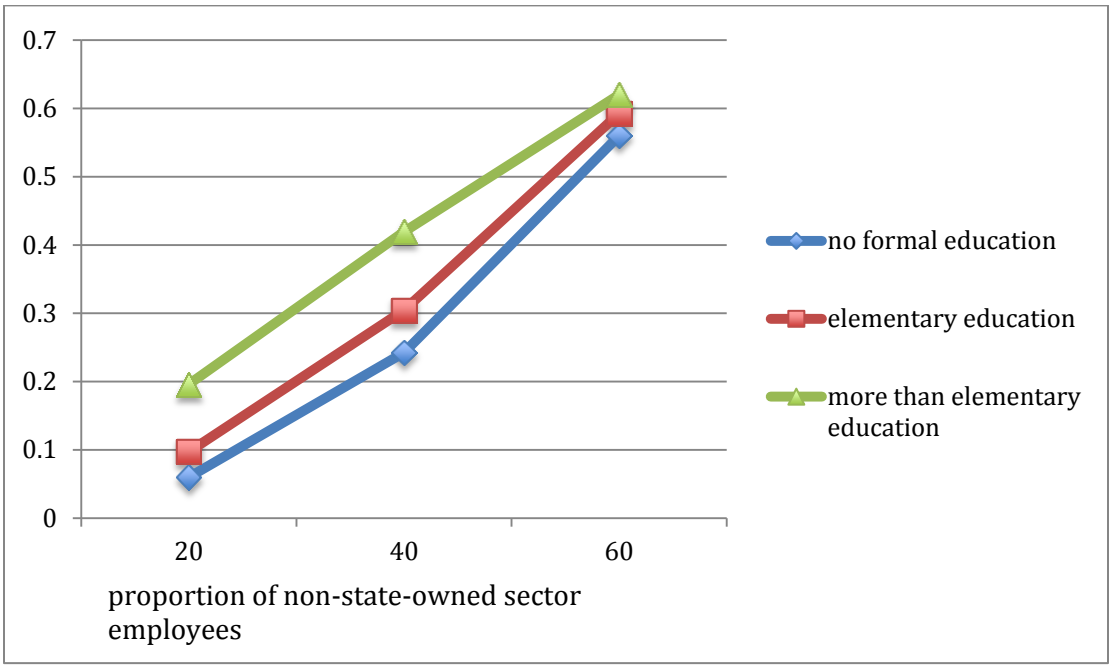


Figure 4.9 Predicted Probabilities of Objective Measure of Successful Aging by Proportion of Non-State-Owned Employees and Different Primary Lifetime Occupations

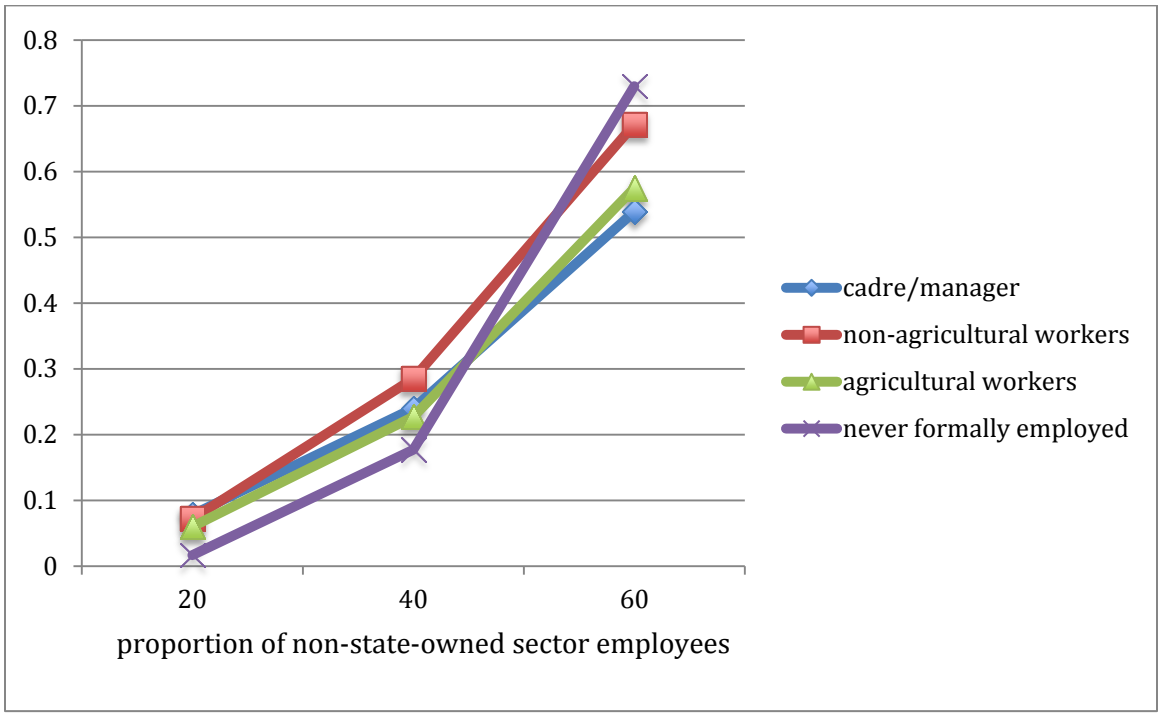


Table 4.12: Estimation of Unconditional Model (Subjective Measure of Successful Aging: As Happy as When Younger)

Fixed Effect	*B (SE)*
Intercept	-.391 (.082) ***
Random Effect	
Level 2(province) variance	.136 (.049) ***
LR Test: chibar2(01)	172.81 ***
ICC	.0408
LL	-7373.6887
N	11199
*** p<0.001	

Table 4.13. Random Intercept Multilevel Logistic Regression Estimates of Subjective Measure of Successful Aging (As Happy as When Younger)

	Model 1	Model 2
Individual-level variables	Coefficient (Std. Err.)	Coefficient (Std. Err.)
Age	.002 (.003)	.002 (.003)
Female	.02 (.062)	.02 (.062)
Ethnic Minority	.36 (.102)***	.36 (.102) ***
Education		
None	---	---
Elementary	.16 (.055)**	.16 (.055) **
More than Elementary	.29 (.088)**	.29 (.088) **
Primary Lifetime Occupation		
Cadres or Managers	---	---
Non-agricultural workers	–.08 (.092)	–.08 (.092)
Agricultural workers	–.29 (.093)**	–.29 (.093) **
Never employed	–.16 (.099)	–.16 (.099)
Exercise		
Never	---	---
Former	.15 (.071)*	.15 (.071)*
Current	.59 (.050)***	.59 (.050)***
Smoke		
Never	---	---
Former	.03 (.061)	.03 (.061)
Current	.06 (.062)	.06 (.062)
Alcohol Consumption		
Never	---	---
Former	–.02 (.063)	–.02 (.063)
Current	.17 (.058)	.17 (.058)
Living Arrangements		
Living in a nursing home	---	---
Living alone	–.24 (.105)*	–.23 (.105) *
Living with spouse only	.08 (.107)	.08 (.107)
Living with children only	–.02 (.089)	–.02 (.090)
Living with children and spouse	.01 (.116)	.01 (.116)
Living with others only	–.13 (.180)	–.13 (.180)
Have frequent sibling-visit	.06 (.058)	.06 (.058)
Have frequent child-visit	.17 (.055)**	.17 (.055) **
Province-level variables		
GDP per capita		.004 (.016)
Income inequality		.73 (.841)
Proportion of non-state-sector employees		.005(.010)
Constant	–.68 (.151)***	–.75 (.163)***
Variance province level (Estimates & S.E.)	.34 (.065) ***	.31 (.061)***
Intra class correlation (%)	9.62	8.61
N individuals	11199	11199
N provinces	22	22

*p<.05, **p<.01, ***p<.001

Table 4.14. Random Intercept Multilevel Logistic Regression Estimates of Subjective Measure of Successful Aging (As Happy as When Younger), with Interaction Effects

	Model 3
	Coefficient (Std. Err.)
Individual-level variables	
Age	.002 (.004)
Female	.02 (.055)
Ethnic Minority	.37 (.091) ***
Education	
None	---
Elementary	.16 (.055) **
More than Elementary	.29 (.088) **
Primary Lifetime Occupation	
Cadres or Managers	---
Non-agricultural workers	–.10 (.093)
Agricultural workers	–.30 (.087) **
Never employed	–.19 (.101) *
Exercise	
Never	---
Former	.15 (.071)*
Current	.59 (.050)***
Smoke	
Never	---
Former	.03 (.061)
Current	.06 (.062)
Alcohol Consumption	
Never	---
Former	–.02 (.063)
Current	.17 (.058)
Living Arrangements	
Living in a nursing home	---
Living alone	–.23 (.105) *
Living with spouse only	.08 (.107)
Living with children only	–.01 (.090)
Living with children and spouse	.01 (.116)
Living with others only	–.13 (.180)
Have frequent sibling-visit	.06 (.058)
Have frequent child-visit	.17 (.055) **
Province-level variables	
GDP per capita	.004 (.016)
Income inequality	.76 (.841).
Proportion of non-state-sector employees	.004 (.011)
Cross-level interaction terms	
Cadres/ Managers * Proportion of non-state-sector employees	---
Non-agricultural workers * Proportion of non-state-sector employees	.005 (.008)
Agricultural workers * Proportion of non-state-sector employees	.017 (.008) *

Table 4.14. Random Intercept Multilevel Logistic Regression Estimates of Subjective Measure of Successful Aging (As Happy as When Younger), with Interaction Effects (Cont.)

	Model 3
Never employed * Proportion of non-state-sector employees	.011 (.008)
Constant	–.73 (.163)***
Variance province level (estimates and s.e.)	.31 (.061)***
Intra class correlation (%)	8.61
N individuals	11199
N provinces	22

*p<.05, **p<.01, ***p<.001

Figure 4.10 Predicted Probabilities of Subjective Measure of Successful Aging (As Happy As When Younger) by Proportion of Non-State-Owned Employees and Different Primary Lifetime Occupations

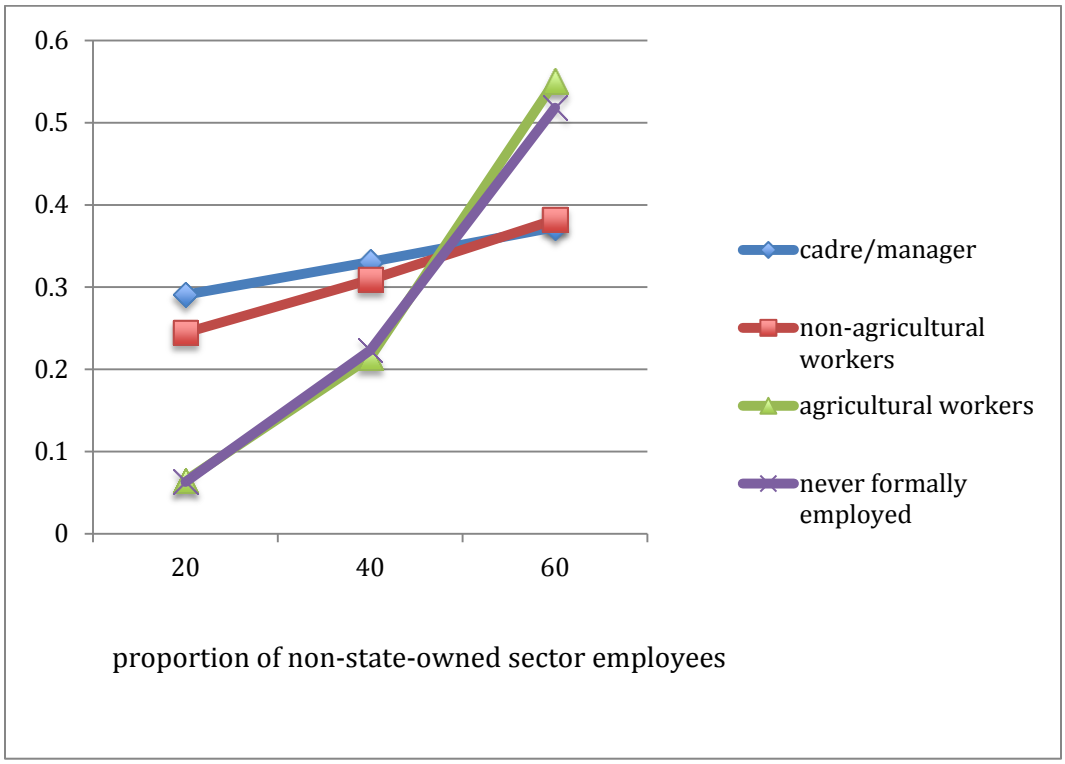


Table 4.15: Estimation of Unconditional Model (Subjective Measure of Successful Aging: Feeling As Useful As When Younger)

Fixed Effect	*B (SE)*
Intercept	-.394 (.053) ***
Random Effect	
Level 2(province) variance	.049 (.019) ***
LR Test: chibar2(01)	82.88 ***
ICC	.0146
LL	-7553.4342
N	11199

*** p<0.001

Table 4.16. Random Intercept Multilevel Logistic Regression Estimates of Subjective Measure of Successful Aging (Feeling As Useful As When Younger)

	Model 1	Model 2
Individual-level variables	Coefficient (Std. Err.)	Coefficient (Std. Err.)
Age	–.001(.003)	–.001 (.003)
Female	–.14 (.060)*	–.14 (.060)*
Ethnic Minority	.28 (.096)	.29 (.097)
Education		
None	---	---
Elementary	.06 (.055)	.06 (.055)
More than Elementary	.19 (.091)**	.19 (.091) **
Primary Lifetime Occupation		
Cadres or Managers	---	---
Non-agricultural workers	–.18 (.089)*	–.18 (.089)*
Agricultural workers	–.47 (.090)***	–.47(.090) ***
Never employed	–.32 (.096)**	–.31 (.096)**
Exercise		
Never	---	---
Former	.11 (.067)	.11 (.067)
Current	.47 (.048)***	.47 (.048)***
Smoke		
Never	---	---
Former	–.03 (.063)	–.03 (.063)
Current	–.05 (.065)	–.05 (.065)
Alcohol Consumption		
Never	---	---
Former	–.12 (.063)*	–.15 (.063) *
Current	.13 (.056)	.13 (.056)
Living Arrangements		
Living in a nursing home	---	---
Living alone	–.18 (.102)	–.17 (.103)
Living with spouse only	.25 (.105)*	.25 (.105) *
Living with children only	.10 (.090)	.10 (.090)
Living with children and spouse	.13 (.109)	.13 (.109)
Living with others only	–.05 (.169)	–.04 (.169)
Have frequent sibling-visit	.13 (.054)	.13 (.054)
Have frequent child-visit	.09 (.048)	.09 (.048)
Province-level variables		
GDP per capita		.003 (.009)
Income inequality		.21 (.457)
Proportion of non-state-owned sector employees		.01(.005)
Constant	–.37(.134)***	–.41(.137)***
Variance province level (estimates and s.e.)	.18 (.038)***	.15 (.034)***
Intra class correlation (%)	5.75	4.50
N individuals	11199	11199
N provinces	22	22

*p<.05, **p<.01, ***p<.001

Table 4.17. Random Intercept Multilevel Logistic Regression Estimates of Subjective Measure of Successful Aging (Feeling As Useful As When Younger), with Interaction Effects

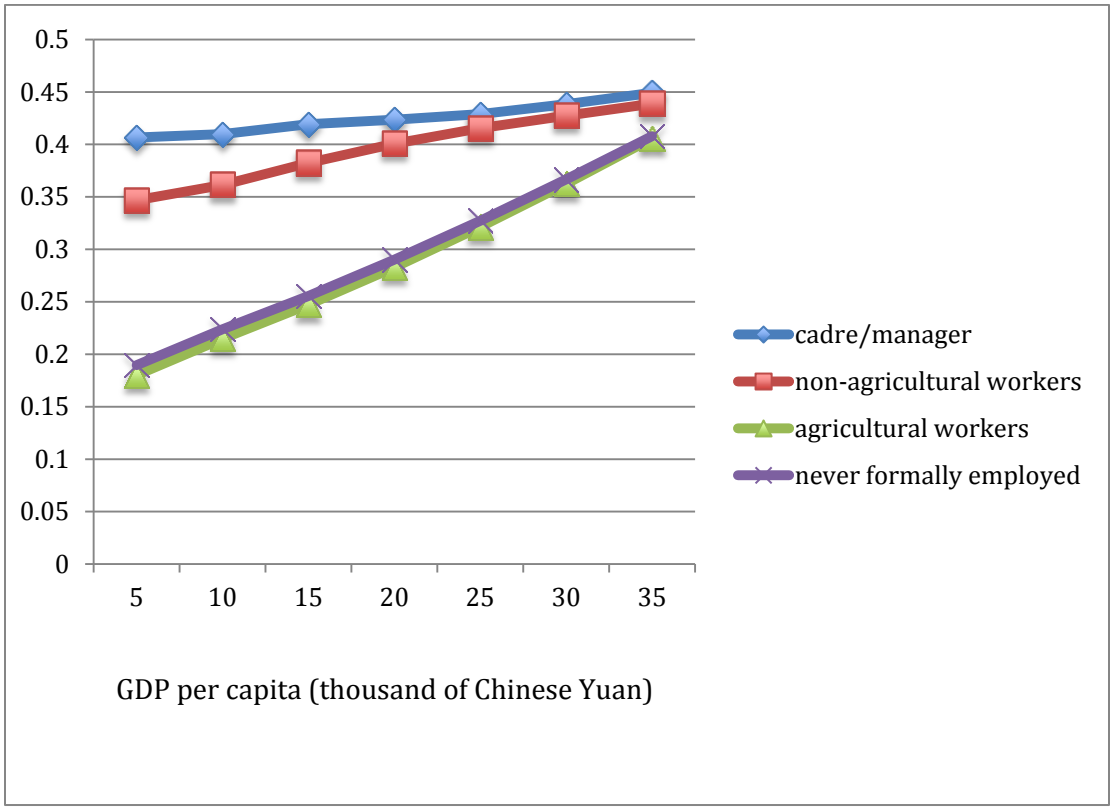
	Model 3
Individual-level variables	Coefficient (Std. Err.)
Age	–.001 (.003)
Female	–.15 (.056)*
Ethnic Minority	.29 (.097)
Education	
None	---
Elementary	.07 (.055)
More than Elementary	.17 (.091) **
Primary Lifetime Occupation	
Cadres or Managers	---
Non-agricultural workers	–.20 (.089) *
Agricultural workers	–.48 (.090) ***
Never employed	–.32 (.096) **
Exercise	
Never	---
Former	.11 (.067)
Current	.48 (.048)***
Smoke	
Never	---
Former	–.03(.063)
Current	–.05 (.065)
Alcohol Consumption	
Never	---
Former	–.15 (.063)*
Current	.13 (.056)
Living Arrangements	
Living in a nursing home	---
Living alone	–.17 (.103)
Living with spouse only	.24 (.105) *
Living with children only	.10 (.090)
Living with children and spouse	.13 (.109)
Living with others only	–.04 (.169)
Have frequent sibling-visit	.13 (.054)
Have frequent child-visit	.10 (.148)
Province-level variables	
GDP per capita	.01 (.011)
Income inequality	.20 (.457)
Proportion of non-state-sector employees	.01(.006)
Cross-level interaction terms	
Cadres/ Managers * GDP per capita	---
Non-agricultural workers * GDP per capita	.018 (.010)
Agricultural workers * GDP per capita	.020(.010)*
Never employed * GDP per capita	.020 (.010)*

Table 4.17. Random Intercept Multilevel Logistic Regression Estimates of Subjective Measure of Successful Aging (Feeling As Useful As When Younger), with Interaction Effects (Cont.)

	Model 3
Constant	–. 35(.131)***
Variance province level (estimates and s.e.)	.03 (.011)***
Intra class correlation (%)	..94
N individuals	11199
N provinces	22

*p<.05, **p<.01, ***p<.001

Figure 4.11 Predicted Probabilities of Subjective Measure of Successful Aging (Feeling As Useful As When Younger) by GDP Per Capita and Different Primary Lifetime Occupations



Chapter Five

Discussion and Conclusion

Recognizing the positive aspects of aging and exploring the ways older people age successfully has become an increasingly popular area of gerontology in recent years. Despite advances in successful aging research, there remain two important gaps in the current research literature: First, most studies, based on Depp and Jeste's (2006) review article, have been limited to the US or some other developed Western countries (e.g. Canada). Relatively little is known about how many older people experience successful aging in other countries, and how well the determinants of successful aging found in Western societies apply to other social contexts. Second, the existing studies overemphasize the role of the individual in successful aging and largely ignore the role that social factors play in successful aging (Riley, 1998; Estes & Mahakian, 2001; Holstein & Minkler, 2003). It is the goal of the current dissertation to bridge these gaps in our knowledge. It makes two important contributions to the burgeoning successful aging literature. First, this study extends a U.S.-based research concept of successful aging to a remarkably different culture, namely China. By doing so, I offer new ways of understanding successful aging. Second, this study places successful aging in the macro-level social contexts. Frequently, the notion of micro-level individual agency (i.e., the choices and behaviors of individuals) lies at the core of current successful aging research. However, I argue this approach is incomplete. Scholars cannot study successful aging as

if individuals exist in a vacuum in which only traits and characteristics, but not macro-level social environments, predict attainment. Rather, individuals are embedded in social contexts and it is almost impossible to separate individual and contextual effects. This study thus establishes a macro-micro linkage in the understanding of successful aging and investigates the ways in which large-scale social changes influence Chinese older people's chances of aging successfully, over and above individual-level characteristics. It has addressed the following questions: (1) To what extent do individual level characteristics affect successful aging? (2) To what extent do province level market transition characteristics affect successful aging? (3) What are the interaction patterns between province level market transition characteristics and individual SES that affect successful aging?

In the earlier chapter, I systematically examined a series of determinants of successful aging, using the 2000 CLHLS dataset. I found that objective successful aging was influenced by both individual-level characteristics and province-level market transition characteristics including economic development, income inequality, and economic ownership restructuring; whereas subjective successful aging was only influenced by individual-level characteristics. Moreover, I found that although economic development and economic ownership restructuring are positively associated with successful aging for all cases, the influences were not evenly distributed among groups, with lower SES older people benefitting more from them than higher SES older adults.

In this chapter, I first highlight the study's significant findings and discuss the results in more depth. I then examine study limitations. I conclude by discussing policy and social work implications drawn from the findings.

5.1. Finding 1: The Association between Individual-level Factors and Successful Aging

The most noteworthy finding regarding individual level factors affecting successful aging is *major lifetime occupation*. For this study, major lifetime occupation has been used to measure individual socioeconomic status. Numerous empirical studies reveal that in general those with higher socioeconomic status experience better health than those with lower levels (Mirowsky, Ross, & Reynolds 2000; Robert & House 2000; Schnittker & McLeod 2005). Moreover, there has been substantial literature on SES gradients in health, arguing that every increase on the socioeconomic ladder is associated with an improvement in health (Bartley, 2004; Culter et al., 2006; House et al, 1988; House, 2002; Williams & Collins, 1995). Although I expected that higher SES group (i.e. cadres or managers in this study) would be more likely to be successful agers than their counterparts, my results show that the situation in China appears to be more complicated. The study shows that cadres or managers are less likely to age successfully if we define successful aging by using objective criteria (having no activity of daily living limitation, having no cognitive impairment, and being actively engaged in life). Using these criteria, those lower SES groups such as non-agricultural workers have better chances of aging successfully. However, higher occupational status has beneficial effects on subjective successful aging. Cadres and managers have more positive view on aging: they are more likely to feel happy compared with agricultural workers, and are more likely to feel useful compared with agricultural workers, non-agricultural workers, and those who never formally worked.

Why is the seemingly universal relationship between higher SES and better health not fully supported in this study? Here I seek an answer by referring to a life course perspective to understand how the past experiences shape present conditions. In general, a life course approach links large-scale social changes to the individual life course and addresses the influence of social events, social context, social network, and previous life history on individual life-course transitions and trajectories (Elder, 1974; Elder, 1985). It is suggested that large-scale social changes inevitably shape and alter individuals' life course, producing lasting effects on their perceptions and behaviors (Alwin, Cohen, and Newcomb 1991; Elder and Clipp 1988), and those significant impacts remain in one's later life (Elder, 1985). Using the life course perspective, scholars examine the historical events (e.g. depression, war, social movement) and life outcomes and many empirical studies offer support to this thesis. They have found that historical events can produce both negative effects on subsequent life experiences (Elder 1995; George 1993; Hogan 1981; Pavalko & Elder 1990) and positive life outcomes (Elder & Hareven, 1993; Xie, 1992).

Two hypotheses grounded in the life course approach used to understand the impact of major historical events such as depression and wars on veterans may be applicable to explain the findings in this study: cumulative disadvantage hypothesis (Dannefer, 1987 & 2003; O'Rand, 1996; Sampson & Laub, 1997; London & Wilmoth, 2006) and positive turning point hypothesis (Elder, 1986; Rutter & Rutter, 1993; Sampson & Laub, 1997; Elder, George, & Shanahan, 1996; London & Wilmoth, 2006). The cumulative disadvantage hypothesis suggests that the effects of early hardship may lead to negative effects in one's later life. Studies on health disparities over the life course

find evidence of cumulative disadvantage in which the effects of early and sustained hardship lead to higher rates of disability and mortality in later life (Lynch, Kaplan, & Shema 1997; Smith & Kington 1997), health problems such as obesity (Ferraro & Kelley-Moore 2003), hypertension, heart disease, and cognitive decline (Dupre 2007 & 2008; Rodgers, Ofstedal, & Herzog 2003). In the case of war, the cumulative disadvantage hypothesis argues that war as a traumatic experience negatively affects servicemen who see combat in their later lives, regardless of their pre-combat characteristics. For example, combat veterans suffer worse physical and mental health than do people who did not see combat (Elder et al. 1994); combat veterans are more likely to die and to commit suicide (Fontana & Rosenheck 1995), to have difficulty finding work, to have lost a job, and to be unemployed (Prigerson, Maciejewski, & Rosenheck 2002; Savoca & Rosenheck 2000).

The positive turning point hypothesis, however, suggests the reverse: historical events may redirect the trajectory of one's life and lead to positive effects in one's later life. For example, in the case of war, Elder (1986) notes military service can be a positive turning point for some veterans because they are more likely to amplify individuals' chances for forming life goals and obtaining necessary skills. Aldwin and Stokols (1988) further explain why traumatic experience can be a positive turning point for some people, they argues that "the experience of successfully coping with adversity may have encouraged more adaptive orientations among these individuals, thereby allowing them to become more successful than their non-deprived counterparts" (p.69).

Based on these two hypotheses, I argue that the inconsistency between the findings of this study and previous studies on higher SES equating to better health may

be attributed to the unique previous life experiences of this group of Chinese older adults. For the current study sample, all of them went through the Chinese Cultural Revolution (1966-1976) during their young-old stage (in their late 50s). During the Chinese Cultural Revolution, the privileges of the state and party cadres or managers were weakened or even disappeared. Rather, cadres or managers were especially targeted. They suffered severely from abuse and persecution in the political campaign, and they were most likely to be forced to relocate into rural areas for hard labor. All of these might have seriously damaged their health, both physically and mentally. On the one hand, based on the cumulative disadvantage hypothesis, the previous hardship could lead to higher probability of health problems in later life. The serious maltreatment of cadres or managers in their young-old years can possibly explain why high-SES backgrounds may not lead to better health in their later years among this cohort of Chinese older people. On the other hand, based on the positive turning point hypothesis, exposure to the hardship during the Cultural Revolution made them feel much more deeply connected to the meaning of hardship and misery, and the roughness and fluctuation in life. Cadres and managers that survived such traumatic experiences, might have a more positive view about life and higher self-efficacy. This is similar to what Elder (1974) describes in his famous study *Children of the Great Depression*: the respondents who remember the most hardship in their youth demonstrate an increase in happiness in later years and they end up happier in middle age because they use the Depression as "a standard for evaluating subsequent life-experiences" (p.259). Surviving from the significant hardship could provide a positive turning point, and this may explain that although they are less likely to be identified as successful agers based on objective health measures, cadres or managers

have more positive subjective perspective of successful aging; that is, they are more likely to have a positive view of aging.

It is worth noting that, from another point of view, the "selective survival" explanation may help to explain why lower SES group such as non-agricultural workers are more likely to be successful agers based on objective health measures. Those lower SES people are more likely to be expose to adverse conditions in their early life than their counterparts in upper social class. For the current study sample, they went through various disasters, for example, the three-year great famine from 1959 to1961, in their late 40s and early 50s. Those non-agricultural workers could be hit harder during a famine. The process of "selective survival" leaves more robust individuals of lower social class alive because only those who are genetically robust could survive early life hardships (Markides & Machalek, 1984). Therefore, it is not unexpected to find that genetically robust lower SES people are more likely to appear healthy in their later lives compared with higher SES people in the same cohort.

The results show that another indicator of individual SES – education – has beneficial effects on successful aging. For both objective measures of successful aging and subjective measures of successful aging, the likelihood of older adults aging successfully increases with increasing level of education. This finding confirms previous studies' findings of a positive relationship between education and successful aging. For example, Strawbridge et al. (2002) find the percentage of older people meeting Rowe and Kahn's definition increase with increasing level of education, with 10.8 percent of those with less than 12 years of education experienced successful aging while 21.7 percent of those with more than 12 years of education. The beneficial effects of education on health

and well-being are well documented in existing literature (Mirowsky & Ross, 2003b). Education may directly positively affect health through enhancing one's sense of control over life, which in turn leads to better health practices (Mirowsky & Ross, 2003b), and causes individuals to be "more receptive to health education messages and more able to communicate with and access appropriate health services" (Galobardes, et al., 2006:56). It may also indirectly relate to health promotion through greater employment opportunities, more favorable working conditions, higher income (Mirowsky & Ross, 2003b), richer social and psychological resources (Ross & Wu, 1995), and a greater likelihood of being and staying in married (Mirowsky & Ross, 2003b), all of which have effects on health and well-being.

In addition to individual SES, several other individual level factors also contribute to successful aging among Chinese older adults. The impacts of some factors are consistent with what are documented in previous studies, while others are in contrast to other findings in the existing literature.

In terms of individual socio-demographic factors, the results show that age is negatively associated with objective successful aging based on the modified Rowe and Kahn's concept (i.e. having no activity of daily living limitation, having no cognitive impairment, and being actively engaged in life). As age increased by one year, the odds of being a successful ager decreased by 10.42 percent. This finding is consistent with previous studies that are based on objective measures of successful aging. For example, Strawbridge et al. (2002) also find that the percentage of older people who age successfully declines with increasing age. The percentages of successful agers for adults ages 65 to 69, 70-79, and 80-99 are 25%, 18.5% and 11.6%, respectively. Similarly,

McLaughlin et al. (2010) find that 2.2% of the oldest–old can be classified as aging successfully while the percentage among the young–old ranges from 15.7% to 16.8%. However, the results suggest that age is not statistically associated with subjective measures of successful aging (i.e. feeling as happy as when younger and feeling as useful as when younger). The reason why age is only related to objective measure of successful aging is largely because of the components of objective successful aging. Given the fact that the percentage of older people with functional limitations, memory impairment, ADL and IADL limitations –(key components of objective successful aging) is higher with increasing age (Ervin, 2006; Crook et al., 1986), it not unexpected to find that age is negatively associated with objective successful aging.

The results also report gender differences in successful aging. Older Chinese women are the disadvantaged group in terms of successful aging: they are less likely to meet Rowe and Kahn's criteria of success and to have a positive view on aging compared with their male counterparts. This is in contrast to other findings in the research literature (e.g. Strawbridge et al., 2002) reporting that a higher percentage of women (21.5%) than men (15.4%) meet Rowe and Kahn's definition of successful aging. Although it is not consistent with previous successful aging literature, my finding echoes results from other studies on gender differentials of Chinese older people. Those studies consistently document that Chinese older women are significantly disadvantaged in cognitive functioning, ADLs, physical performance such as standing up from a chair and picking up a book from the floor, and self-reported health (Wang et al., 2000; Zeng et al., 2003; Zhang, 2006). Older Chinese women's disadvantages in multiple health indicators could be largely due to their lifetime of social economic disadvantage. Chinese women's social

status is historically lower than that of men especially for the older generation who spent their childhood and adulthood in a patriarchal society (Zhang, 2006). They were less likely to have enough nutrition during their childhood (Watson, 1991); less likely to have educational opportunities and thus most likely to be illiterate (Shu, 2004); and less likely to have occupational opportunities and thus more likely to be excluded from economic roles (Shu, 2004; Zhang, 2006). All these gender inequalities experienced over the life course may reduce Chinese women's chances of aging successfully.

In regard to behavioral determinants, the results confirm previous studies' findings to a strong positive relationship between exercise and successful aging, and a negative relationship between smoking and alcohol consumption and continued health (Burke et al., 2001; Depp & Jeste, 2006).

The findings regarding the effects of social support basically supported the hypotheses. As expected, frequent contact with family members is positively associated with successful aging; living with family members, including living with spouse only, living with children only, and living with spouse and children, has beneficially effect on objective successful aging. Living with a spouse has a beneficial effect on subjective successful aging, that is, older people who live with their spouses are more likely to have a more positive view of aging compared with those who live in institutions. However, living alone has different effects on objective successful aging and subjective successful aging. On the one hand, living alone is negatively associated with feeling as happy as when younger compared with those who live in institutions. On the other hand, elders who live alone are more likely to age successfully based on objective criteria compared with those who live in institutions. The possible explanation for the beneficial effect of

living alone on objective successful aging could be due to the endogenous problems in cross-sectional dataset. In this case, the relationship between living arrangements and health could be the other way around, that is, it could be that those who are healthy choose to live alone. Therefore, since the objective criteria of successful aging is more focused on the health indicators (e.g. ADLs and MMSE), it is not unexpected to find that living alone is positively associated with successful aging.

5.2. Finding 2: The Association between Economic Development and Successful Aging

Province-level economic development (measured by GDP per capita) is found to be associated with successful aging. Specifically, the results show that economic development is positively associated with both objective measure of successful aging. Although GDP per capita falls short of statistical significance in predicting subjective successful aging, the positive coefficients indicate somewhat GDP per capita associated with an increased probability of subjective successful aging.

Two theories have been offered to explain how economic development exerts an effect on individual well-being: The relative preference theory (Easterlin, 1974) and the absolute utility theory (Veenhoven, 1989, 1991). The relative preference theory (Easterlin, 1974) argues that the impact of wealth on individual well-being depends on changeable standards such as adaptation, expectations, and social comparisons. In other words, the impact of wealth on individual well-being is relative to the individual's own previous wealth level or relative to other people. The absolute utility theory (Veenhoven, 1989, 1991) states that wealth helps individuals meet certain universal needs such as

nutrition, comfortable housing and health care, and self-actualizing needs and therefore that wealth is a cause of individual well-being.

The finding here is more in line with the absolute utility theory, in that economic development may lead to increased individual well-being especially physical well-being through needs-met. The similar argument in public health is the "wealthier is healthier" argument proposed by Pritchett and Summers (1996), which believes that economic development affects health through better material living standards such as nutrition and improved health services, both of which are crucial to maintain good health (Preston, 1975; Flegg, 1982). In China's case, economic development increases people's living standards in general. Indeed, China has experienced rapid economic growth at an average annual rate of 9.3% since the market transition was initiated, fundamentally improving the living conditions of many of the 1.3 billion Chinese (Chinese Academy of Social Sciences, 2005). The average income of the rural population more than tripled and quadrupled for urban population within one decade, pulling millions of Chinese out of poverty (Ravallion & Chen, 2007). China's human development index also rose from 0.37 to 0.68 during the past thirty years (UNDP, 2010). People's basic physical needs for food, shelter, and clothing are most likely to be met along with ongoing rises in living standards.

5.3. Finding 3: The Association between Income Inequality and Successful Aging

In this dissertation, I also explored the relationship between income inequality and successful aging. Based on previous empirical study in the health realm, I hypothesized that income inequality would have a detrimental impact on successful aging. The results,

however, do not support my hypothesis. The coefficients of income inequality are all positive in predicting objective successful aging and subjective successful aging, although the latter fall short of statistical significance. In predicting objective successful aging, income inequality has an interesting concave relationship with successful aging, that is, the likelihood of aging successfully increases with income inequality at first and then decreases with income inequality when inequality is above a certain level.

How can we explain the finding that within a certain level, income inequality actually is positively associated with successful aging? I speculate that the mechanism through which income inequality is positively associated with successful aging might be the psychological mechanism – prospect of upward mobility. One plausible explanation is that the pattern we found here may fit a pattern of tolerance for inequalities that Hirschman and Rothschild (1973) described as the "tunnel effect." The "tunnel effect" argument describes this scenario,

> "Suppose that I drive through a two-lane tunnel, both lanes going in the same direction, and run into a serious traffic jam. No car moves in either lane as far as I can see. I am in the left lane and feel dejected. After a while the cars in the right lane begin to move. Naturally my spirits lift considerably, for I know the jam has been broken and that my lane's turn to move will surely come at any moment now. Even though I still sit still, I feel much better off than before because of the expectation that I shall soon be on the move" (Hirshman & Rothschild, 1973, p. 545).

In this scenario, people frame their attitudes by their long-term expectations, rather than their current situation. Therefore, they will tolerate the current inequality rather than protest it if they expect their wellbeing to improve. This "prospect of upward mobility hypothesis" (Benabou & Ok, 2001) is especially useful in explaining why rising inequality is tolerated in rapidly developing countries. Whyte (2010) also uses it to argue

why Chinese people accept the current inequalities. Using data from the 2004 China Inequality and Distributive Justice Survey, Whyte (2010) find that most survey respondents "voiced more acceptance than anger about current inequalities" (p.182) although they "felt that the gap in incomes nationwide was too large" (p.182). Whyte argues that the key issue here is that China's economy as a whole provides improving living standards and dynamic development and people see the current rising inequality as new opportunities that enable ordinary people to get ahead through talent, hard work and training. The psychological mechanisms through which people may tolerate inequality are like what Shapiro (2002) proposes that include: (1) Backward-looking framing effects (p.121); this mechanism focuses on the past. Based on this, people may lower the levels of perceived social inequality if they feel they are at least better off than they were in the past. (2) downward-looking framing effects (p.122). This mechanism directs attention to those even worse off in the society. People may tolerate current inequality through downward social comparison. (3) Inward-looking framing effects (p.122); this mechanism focuses on yourself. Based on this, people "blame themselves for their circumstances and accept that they should look inward when trying to improve them" (p122). Therefore, as long as they are doing well economically relative to those less fortunate in the social order and to their previous economic situation, and see chances to get ahead, people generally "have accepted and seem to be comfortable operating within the market system" (Whyte, 2010: 182).

Of course, when the chance of getting ahead becomes slim, the detrimental impact of inequality will become visible. Continuing Hirshman and Rothschild's (1973) "tunnel effect" argument:

> "But suppose that the expectation is disappointed and only the right lane keeps moving. In that case, I, along with my left lane cosufferers…shall become extremely angry and sad about the injustice." (Hirshman & Rothschild, 1973, p. 545)

Therefore, as China's reform continues to increase income inequality, it is likely that Chinese people will experience a growing sense of relative deprivation. Since relative economic well-being is associated with psychological distress, the detrimental impact of inequality on successful aging can be expected to be visible as the reform proceeds, as my results show that the squared term of income inequality is negative, meaning that the likelihood of aging successfully will decreased with income inequality when inequality is above a certain level.

5.4. Finding 4: The Association between Economic Ownership Restructuring and Successful Aging

The last province-level factor I examined is economic ownership restructuring (measured by proportion of non-state-owned employment). Aging, the results show that the proportion of non-state-owned employment is positively associated with objective successful aging. In other words, older people living in more marketized provinces are more likely to age successfully based on objective criteria. Although this variable falls short of statistical significance in predicting subjective successful aging, its coefficient is also positive.

As discussed in Chapter two, pervious studies generally document the negative consequences of ownership restructuring in transitional societies such as Russia and Eastern Europe, including sharp increases in mortality, mass psychological stress, and

dramatic deteriorations in quality of people's lives. Drawing on this literature, I hypothesized that economic ownership restructuring would be negatively associated with successful aging. The results here, clearly, do not support my hypothesis. What can possibly explain such reversed patterns in China and other transitional societies? I believe that the answer lies in China's unique market transition pathway that is quite different from the transitions experienced by Russia and Eastern Europe.

First, economic ownership restructuring in China did not sacrifice growth as a price. Rather, restructuring was taking place during the same period that the Chinese economy enjoyed over 9 percent growth per year. Russia has suffered huge economic decline during the reforms. Mass impoverishment and widespread disappointment among the people due to the economic stagnation have produced the negative health effects and deteriorations in quality of people's lives (Bjørnskov et al., 2007; Brainerd & Cutler, 2005; Shkolnikov et al., 2004). China successfully avoided the economic depressions that may yield mass psychological stress, and its rapid economic growth has largely reduced the proportion of the population living in poverty and substantially improved the living standards in general. Although during the same period, the socialist healthcare institutions largely has weakened and the new market-oriented Chinese health care reform since late 1990s is basically a failure (Yip & Hsiao, 2008), the fact that average Chinese families and communities have become wealthier and have perceived a possibility of upward social mobility have largely counteracted and overwhelmed the negative consequences a poor healthcare system may cause (Whyte & Sun, 2010).

Second, China's economic ownership restructuring rejected a "shock therapy" or "big bang" approach and took a "dual-track" and "gradual" approach. In Eastern Europe

and the former Soviet Union, the predominant objective was to move as rapidly as feasible to a modern market economy, using the strategy called the "big bang" or "shock therapy" (Rawski, 1994). In contrast, China adopted a gradual sequencing strategy. China's transition from a planned to a market economy has often been viewed as an evolutionary process in two stages (Qian, 2003): the first stage spanned about fifteen years between 1978 and 1993, and the second stage began in 1994. The first stage is characterized as gradual and dual-track, which refers to the coexistence of a traditional plan and a market channel for the allocation goods (Lau et al., 2000). In this stage, reform was carried out incrementally to expand the scope of the market, allowing the foreign, private, village-owned firms to develop outside of the plan, while at the same time core interests were protected, state-owned enterprises were preserved, and the basic institutional framework of central planning remained intact (Lau et al., 2000; Qian, 2003). Since 1994, reform became more fundamental and thorough. In this second stage, China started to restructure the key market sectors include the banking system, the tax system, and the system of corporate governance (Naughton, 2007).

Using this approach, reformers can control the speed and scale of economic ownership restructuring, acquire valuable knowledge and experiences for further extending the reform into other sectors, correct political errors, and avoid institutional collapse (Dewatripont & Roland, 1992; Gallagher, 2005; Lau et al., 2000). Gallagher (2005) notes that the sequence and timing of Chinese reform has eased the potential social opposition and delayed the massive structural unemployment. China chose not to reform its state sector first in order to protect it but to open itself to foreign capital. As Gallagher (2005) argues, the foreign-invested sector became the laboratories for sensitive

future labor reforms that could have been opposed fiercely if otherwise enacted in the state sector first; the large influx of foreign direct investment (FDI) also created competitive pressures on the state sector by attracting the young and skilled away from the state sector, and further justified deeper reform. This particular sequencing of reform successfully dissolved a potential social crisis and a political crisis. Some scholars (e.g. Lau, Qian, & Roland, 2000) even call China's reform a "reform without losers". Although this claim is not completely true (Gallagher, 2005) – the downsizing of state-owned enterprises did substantially increase the unemployment since the mid-1990s, and the slowed-down reform process protected workers from hyperinflation and the shock of unemployment and delayed the most painful reforms until after almost 20 years of rapid growth. Moreover, for most Chinese – and particularly for rural Chinese – the development of foreign, private, village-owned firms has meant improved employment opportunities. Since previous studies on the impacts of market transition in Eastern Europe indicate that the rapid and large scale privatization and unexpected dismantling of the Soviet system are associated with mass psychological stress and anxiety that had negative impacts on other health indicators, the fact that China's gradual dual-track reform avoided institutional collapse, rapid large-scale privatization, and sudden economic contraction may help explain the positive impact on older people's aging experiences.

Third, China has policy responses to compensate the reform losers. China's economic ownership restructuring did create "losers" – millions of laid-off state-owned enterprises (SOE) workers and millions of retired SOE workers not receiving their full pensions were those who most severely affected by economic restructuring (Hurst &

O'Brien, 2002; Solinger, 2008). "Livelihood difficulties" from pension arrears led to a surge of working-class protests (Hurst & O'Brien, 2002). In the 1990s, the number of workers and retirees' protests nearly quadrupled, from 8700 to 32000, and they became very common especially in the northeastern industrial provinces (Lakshmanan, 2002). The reason why it didn't become a widespread social and political crisis is very likely because several welfare programs were initiated as the approach to handle the people most severely affected by economic restructuring (Solinger, 2008). Two programs in particular targeted these groups: Pension and Minimum Livelihood Guarantee. These programs have been given considerable priority in China's welfare reform (Gao, 2006; Solinger, 2008).

China had maintained an urban- and enterprise-based pay-as-you-go (PAYGO) pension system until the mid-1980s. This system had a high risk of funding shortages when the enterprises were running at profit loss (IPC, 2007). During the economic ownership restructuring, a large number of small and medium state-owned enterprises (SOE) were fully or partially privatized which resulted in waves of early retirement; meanwhile, those financially troubled SOEs met severe pension deficits. Many enterprises began to delay or stop pension payments, which led to waves of unrest and demonstrations. Those workers and retirees' protests were viewed as a major threat to social stability (Hurst & O'Brien, 2002; Solinger, 2008). Social welfare usually is a low priority for the central government. However, the central government gives top priority to areas where "social stability" seems to be threatened. The timing and the intensity of workers protest correlated with the central government's decision to reform China's pension system. Since 1991, the State Council issued a series of decrees calling for a

structural reform of China's pension system that aims at a "socialized" program rather than the traditional enterprise-based pension programs (China State Council, 1991; 1995; 1997a; 2000). According to these pension reform decrees, the new pension system aims to be a three-pillar pension scheme in which provincial governments finance the basic pension pillar, individuals and enterprise contributions finance the supplemental pension pillar, and the third pillar of enterprise pensions are optional. The pilot program was first introduced in Liaoning province as it faced the largest number of laid-off SOE workers and retiree demonstrations since the economic reform.

During the same period, another program – Minimum Livelihood Guarantee – was initiated to maintain the living standard of the urban new poor. Most of these people are the laid-off SOE workers who were most severely affected by economic restructuring. This program is a means-tested cash transfer program that is to provide urban residents whose household income failed to reach a locally-determined minimal threshold (Hussain et al., 2002). It targets three types of people: the traditional "three nos" people (those who have no work ability, no family to support them, and no any source of livelihood), the unemployed whose unemployment insurance benefits have been terminated and their total household incomes are below the locally defined assistance line, and employees whose working incomes, including pensions and allowances, are below the locally defined assistance line (Tang et al., 2003). Minimum Livelihood Guarantee program was first implemented in Shanghai in 1993. In 1994 the Ministry of Civil Affairs (MCA) encouraged other cities to adopt the program. In 1997, when the accelerated SOE restructuring started, the State Council issued a circular requiring the establishment of Minimum Livelihood Guarantee program in all cities in China (China State Council,

1997b). In 1999, the program was established in all the cities and started to gradually extend to the rural area.

Pension and Minimum Livelihood Guarantee have received the most attention from the central government given the social influence these programs exert. These programs are not only used to solve the livelihood problems of the people who are most severely affected by economic restructuring but also to realize social stability and psychologically increase the trust of the group to the government. This assures that the reform can smoothly continue (Solinger, 2008; 2010). Between 1999 and 2000, the central government issued a series of policies to ensure the punctual and full distribution of pension and minimum livelihood guarantee program (MLOSS, 1999; MHRSS, 2000). The implementation of "Two Guarantees" (guarantee delivery of pension benefits and Minimum Livelihood Guarantee program on time and in full) has become the top priority of local governments at different levels (MLOSS, 1999; MHRSS, 2000) and even connected with officials' performance evaluation and promotion (Gao, 2006). These two programs also receive the most government subsidies (MHRSS, 2005). Because of these efforts, the living difficulties of "reform losers" are effectively alleviated and retirees are found to be one of the social groups that have received the most benefits through the programs (Gao, 2006). Frazier's (2010) recent study on China's pension also emphasizes that pension reform has benefitted the Chinese public. The public opinion surveys and focus group he conducts has demonstrated that the urban populace appears satisfied with the status quo.

Taken together, it is reasonable to believe that China's unique market transition pathway features a sound economic growth, a shock-avoiding and gradual fashion, and

relatively effective policy responses help to ameliorate the social cost of economic restructuring, creating a general positive environment for its senior citizens, which makes successful aging more likely.

5.5. Finding 5: Interaction effect between individual SES and market transition on successful aging

In this dissertation, I also explored the interaction effect between individual SES and province-level market transition characteristics in order to examine which groups benefited most from the market transition in China. Based on previous studies on market transition in China, I hypothesized that high SES people – those who with high education levels, or former cadres and managers – would benefit most from the market transition.

However, the results contradict this hypothesis, with low SES older people (those who were never formally employed, who were agricultural workers, and who had no formal education) reporting better chances of aging successfully in terms of all successful aging measures compared with their high SES counterparts. In other words, low SES older people benefited more than high SES older people from China's market transition.

How can we explain this unexpected pattern? Below I offer some possible explanations. First, the hypothesis that older people with high education levels would benefit most from market transition than their low-education counterparts is based on previous literature suggests that the emergence of an open labor market has enabled older adults with high education levels to engage in post-retirement employment and thus to improve their economic well-being substantially (Davis, 1988; Hayward & Wang, 1993). I speculate that the reason why people with high education levels did not benefit most

from market transition probably lies in the motivation of post-retirement employment. As Raymo & Xie (2000) argue, older people seek post-retirement employment because of financial need rather than for new opportunities. Using data from the 1992 Survey of the Support for the Elderly in Urban China, Raymo and Xie (2000) find that older people with less money are more likely to be engaged in post-retirement employment and conclude that economic necessity is a prime motivation for reemployment. Borrowing Raymo and Xie's (2000) arguments, I speculate that older people without any formal education might reenter the labor force out of financial necessity because this group usually had very limited retirement wages. Market transition opens the labor market and makes post-retirement employment possible. In this sense, their post-retirement labor income could supplement their income shortage and help to improve their overall well-being. While older people with high education level usually had sound retired wage, so even though market transition brings more opportunities for post-retirement employment for high-educated people, they probably had no motivation for reemployment. In short, it may be that older people without any formal education benefited most from market transition through the mechanism of post-retirement employment that market transition makes it possible.

Second, another possible explanation of why older people who were never formally employed and who were agricultural workers benefited more than cadres or managers from market transition may lie in the fact that China's market transition initially created greater opportunities for low SES people who were in the countryside and previously excluded from the formal employment system. In other words, for those

agricultural workers in the countryside and people without work-unit affiliation, market transition may become a beneficial turning point.

Under the planned economy, workplace organizations or work units were the principal administrative units for urban residents. The government took full responsibility for providing subsidized food, free medical care and housing to urban residents through their work units, but not to those who were excluded from the formal work unit system. It was difficult to survive in a city without a work unit because work units administrated social necessities such as housing, basic food, health care, and transportation, which were almost unavailable through the market (Wu & Treiman, 2004). In the countryside, the agricultural sector had been exploited for a long time. Peasants were forbidden to migrate elsewhere in search of better job opportunities; they were bound to the land through the commune system, which served as the main administrative system to organize economies, allocate resources, and control the rural residents (Wu & Treiman, 2004).

The tight administrative control was relaxed since market transition. Economic reforms were first launched and more active in the countryside (Naughton, 2007). The commune system was abolished and the new "household responsibility system" was introduced. The household responsibility system allowed peasants to sell their surplus in free markets and make profits after they sold a certain amount of agricultural products to the state at a price set by the government (Wu & Treiman, 2004). More importantly, peasants are allowed and also encouraged to develop township and village enterprises (TVEs). TVEs have had a huge impact on the reduction of rural underemployment (Rozelle & Boisver, 1994). Through increasing local employment opportunities, TVEs help to raise per capita income within the locality. For many localities, TVEs are the only

available path out of poverty (Naughton, 2007). They also increase the local public goods provision due to the improvement of the local government's revenue (Chang et al., 2003). In addition, market transition relaxed previously rigid administrative control over rural-to-urban migration. Peasants now are allowed to seek jobs in non-agricultural sectors in urban enterprises or start small businesses in cities (Wu & Xie 2003).

In urban areas, the government began to cut the formerly close tie that bound government and state-owned enterprise and the importance of the urban work units has been diminishing since market transition. The old work unit system has been replaced with a market-driven one. Social welfare provision has been delinked from work units, with focusing more on residency rather than job affiliation.

All these changes have significance for people who were outside the state sector. For those who worked in the agricultural sector, de-collectivization of agriculture and the fast development of the Township and Village Enterprises have provided them with a better income source than farming. Relaxation of migration restrictions provides more off-farm job opportunities with higher income for young peasants, which has made it more likely for them to provide financial support to their elder parents. For those who were never formally employed, market transition brings economic prosperity, opens labor market, and allows and encourages private economy. All of these represent new opportunities for those who were excluded from the old work unit system. In addition, new "socialized" welfare programs also extend to those who were excluded from the generous social safety nets offered through work units. In short, market transition altered the disadvantage situation of older people who worked in the agricultural sector and who were excluded from the formal work unit system in multiple and fundamental ways. As a

result, market transition serves as a positive turning point in their lives. The diverging personal experiences under planned economy and since may explain why they benefitted most from market transition.

It is worth noting that the way market transition altered the disadvantage situation of low SES people could be indirect. In other words, it might through an intergenerational transfer mechanism – it could be that market transition provides more economic and employment opportunities for their adult children. As some scholars (e.g. Liu & Reilly, 2004; Zhang, 2002) indicate, with children's increased economic capacity, older people are more likely to benefit financially. Unfortunately, the current dataset does not include information about the respondents' adult children. Future research may want to test this mechanism when a better dataset is available.

5.6. Study Limitations

While this study adds to our understanding of successful aging in the context of market transition in China, several study limitations must be noted.

First, the subjective measures used in this study to assess successful aging are less than ideal and therefore may not adequately reflect the actual subjective meaning of "successful aging" among Chinese older adults. In particular, two items were used to measure subjective successful aging were derived from the information available in CLHLS dataset for the present study – (1) "are you as happy as when you were younger?" and (2) "do you feel the older you get, the more useless you are?" The original variable in the dataset was the five-scale variables (from 1=never to 5=always). I dichotomized these two items in the analyses and conducted multilevel logistic

regression. This is easy for results interpretation but may suffer information lost from the variables since the five-point variable provides more differentiated information than the dichotomous variable.

In addition, two variables of subjective successful aging used in this dissertation – "feeling as happy as when younger" and "feeling as useful as when younger" may not be the ideal measures of subjective successful aging. The CLHLS does not include questions asking about whether older people think they are aging successfully or how they define successful aging. Thus, it is reasonable to question to what extent the two items used in the present study can adequately capture older people's subjective perception of "successful aging." How older people understand successful aging is contingent upon their cultural origin and their social construction of reality (Bowling, 1993). To improve the understanding of subjective perception of successful aging, future research may require a qualitative study to generate a culturally relevant concept of successful aging.

Second, the measure of Rowe and Kahn's definition of objective successful aging was also less than perfect. Specifically, one criterion – "no major diseases" – was removed from the measurement in this study because the chronic disease items in CLHLS might be problematic. It should be noted, that if this criterion were included into the measurement, the percentage of older adults meeting Rowe and Kahn's definition would have been 34.81 percent, 9.65 percent lower than the current result. And given the fact that the chronic disease reporting was already underestimated in CLHLS, the percentage of older adults truly meeting Rowe and Kahn's definition could be even lower. Consequently, the percentage of older adults that met Rowe and Kahn's definition of successful aging in this sample is undoubtedly overestimated. When a better dataset is

available, future studies of objective successful aging should include the "no major diseases" criterion.

The third limitation of this study concerns province-level variables. Market transition is, of course, a complex process that includes many aspects. Economic development, ownership restructuring, and income inequality are only parts of market transition. There are other aspects associated with province-level market transition in China that I am not able to include in the models may potentially affect the results. For example, as Figure 4.4 shows, the percentage of successful agers in Hubei – a central province with low GDP per capita, low proportion of employment in non-state-owned sectors – is rather high. Clearly, there are other important confounding factors that could be adjusted in the model. These confounding factors could include environmental factors – such as climate change, or pollution that might be the side-effect of market transition, and provincial-specific lifestyle factors such as eating habits. The reason why I was not able to examine these potential confounding factors in the current analysis models is because (1) these potential confounding factors such as climate change, pollution, or lifestyle factors were lacking in the available data. (2) Due to the relatively small number of provinces at level two (n=22), I was not able to incorporate as many as possible province-level variables in a multilevel model because of the limited degrees of freedom (Snijders & Bosker, 1999). Future research regarding the effects of market transition on individual well-being may want to look at those factors.

The fourth limitation concerns the nature of cross-sectional data. This is a cross-sectional study so causality should not be implied. Also, market transition is a process that spans a long period of time. By using a cross-sectional data, this study only shows a

snapshot of the association between market transition and successful aging in 2000. It does not show over time trends and therefore it can't capture the dynamic nature of marketization. What is the long-term effect of market transition on successful aging? Whether the effects of market transition on successful aging are cumulative or not? Will the group experienced gain during the early stage continue to benefit from market transition? Or, will the benefits diminish after a certain point? We cannot seek adequate answers to these questions from the present study. This limitation could be improved by using data from multiple time periods in the future studies.

Fifth, the sample used in this study is a sample of oldest old Chinese (the mean of age was 91.3 in year 2000). This group of older people has witnessed the critical transition in Chinese history. They have survived one of the most difficult historical periods of China and experienced numerous wars, nature disasters, and political turmoil, including War of Resistance against Japan (1937-1945), Chinese Civil War (1945-1949), Three-year Great Famine (1959-1961), Cultural Revolution (1966-1976). It is reasonable to believe that this group of older people must be physically and psychologically strong in order to have survived so long and eventually to have been included in this study. Thus, they may be too special to fully represent their entire generation. Meanwhile, there may be cohort effects that would change the magnitude of the association between market transition and successful aging. Different cohorts might perceive the economic change and its consequences bring about during transition differently. Future cohort of older adults may have very different experiences during market transition. In short, caution should be taken when making generalization from results of present study.

Finally, the survey used in this study does not include information about respondents' adult children. This limits my ability to examine the possible mechanism through which market transition affects older people's well-being. As I mentioned early, it is possible that market transition provides more economic and employment opportunities for older people's adult children. Those children further provided better support to their elderly parents, which may substantially improve elder's overall well-being. Indeed, influenced by traditional Confucian philosophy, Chinese society values filial piety and emphasizes the obligation of adult children to provide support to their elderly parents. This obligation of children to support their older parents has been legally reinforced by the Chinese Constitution (1954, 1982), Marriage Law (1980) and Elder Law (1996). This suggests that family support and intergenerational financial transition from adult children to their parents might have significant influence on the wellbeing of Chinese older people in addition to their own SES. Therefore, better information about adult children would reveal further insight into the effects of market transition on older people's well-being. This also suggests that in China, a country that values familism and filial piety, it is more necessary to take an extended family perspective in studying older people. Future survey about Chinese older adults should include information about their extended families, especially about their adult children.

5.7. Policy and Social Work Implications

Despite aforementioned limitations, this study is one of the few to examine the relationship between successful aging and market transition using a nationally

representative sample of Chinese older adults. Several implications can be drawn from the present study.

First, this study shows that 44.46 percent of the respondents met Rowe and Kahn's successful aging definition (i.e. no ADL limitations, no cognitive impairment, and being actively engaged in life), nearly 39 percent of the respondents reported feeling as happy as when younger, and about 41 percent reported feeling as useful as when younger. These results imply that successful aging can be achieved even in extremely late life – given the fact that the average age of the sample is over 90. Therefore, for social work implication, social workers may want to put efforts on a series of educational programs for older adults themselves, their family members, and the public to (1) help older people to have a positive evaluation of one's self and improve awareness that thriving in older adulthood is possible, and (2) to foster positive expectations for older people and fight ageist stereotypes in the society that always portray a negative image of a person's competence in late life.

Second, the results of this study suggest that successful aging can be influenced by both individual-level characteristics and province-level characteristics. As a result, both individual-level direct intervention and policies targeting the relevant factors as indirect ways should both be take into consideration in increasing older people's wellbeing. This echoes Holstein and Minkler's (2003) argument that interventions should avoid overemphasizing individual-level behaviors and pay attention to broader social context that makes it more or less difficult for some to engage in certain behaviors.

At the individual level, this study found regular exercises to be a strong predictor of successful aging. One implication is the importance of designing health promotion

programs in the community. It is worth noting here that based on the life course theory, people's experiences and exposures in early life influences how they experience older adulthood. Therefore, health interventions aimed at improving the health of older adults could also extend to younger adults.

Results also show that the oldest old women are less likely to meet Rowe and Kahn's successful aging criteria and less likely to have a positive view on aging. This implies that any successful aging promotion programs should take into account the disadvantaged status of the oldest old women to ensure that programs to be developed will benefit older women and men equally.

Older people who live alone are found to be less likely to feel happy. Social workers should pay more attention to this group. People who live alone can be limited in the availability of persons to turn to in times of need and with whom they can share psychological concerns. Limitations in the availability of daily contacts with others, living alone may make social isolation more likely. Social isolation has been found to be associated with poorer physical and psychological wellbeing of the older people and with increased risk of death (Seeman et al., 1993; Sugisawa, Liang, & Liu, 1994). In current China, family size is shrinking. The rapid growth of urbanization and the relaxed policy controls on labor migration have led to increasing spatial mobility and distant family networks. Particularly in rural areas, a mass of young and middle-aged people migrate to urban areas for off-farm employment opportunities, leaving their older parents alone at home. It is reasonable to expect that in the future the number of older people who live alone will increase. Social workers need to help this group of older people to reduce social isolation by facilitating interactions with other people. This might include bringing

community members together through various community social events. Social policies also can be developed to eliminate barriers to participation. For example, pro-social exchange policies could provide low-cost transportation for older people. This low-cost transportation could facilitate connecting older people with friends and non-coresident children or other relatives, help them to attend group meetings, or allow them to participate in community activities.

Third, for the policy implication, policies focusing on economic status will need to focus on both the absolute economic development and the distribution of the economic resources. On the one hand, it is true that the Chinese generally have benefitted from the rapid economic growth since market transition. Maintaining stable economic growth seems continue to be one of the major objectives of the state policy. On the other hand, government should show greater concern for reducing income inequality; social equality should also enter the policy agenda in order to create a "Harmonious Society." Although the results show, in the short term, that income inequality does not have a detrimental effect on an individual well-being, the long-term negative effect of income inequality cannot be overlooked. As Graham (2008) notes "humans are on a 'hedonic treadmill': Aspirations increase along with income and, after basic needs are met, relative rather than absolute levels matter to well-being" (p.77). If deepening economic reform brings growing income inequality, the detrimental effect of income inequality will definitely be visible. Therefore, there must be some redistribution policies to counteract the negative effect on individual well-being.

Finally, the general beneficial effects of market transition on successful aging found in the present study is largely due to the positive economic experiences and the

optimistic expectations of getting ahead. It is likely, when China's economic slows down, that these positive effects may diminish. Based on the former Soviet Union experience, older people are more likely to fall behind in a society lack of sound economy and sustainable public finance (Horvat & Evans, 2010). With this in mind, developing effective social protection, improving social security, further reforming the pension system, and ensuring the accessibility and affordability of health care, especially extending the coverage to rural older people, should be advocated to be at the top of the agenda for the government.

In conclusion, this study presents an important step in understanding successful aging among Chinese older adults. It points to the need to explore the effects of market transition on older people's wellbeing. The results suggest that successful aging is not only associated with individual-level characteristics but also with province-level market transition. The work also reveals the associations between market transition and successful aging vary across education and occupation groups. Future research is needed to better understand the underlying mechanisms through which market transition affects successful aging and how the influence continues and changes over time.

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