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**Beliefs about Aging and Later Life Health and Well-Being among the
Elderly in Taiwan**

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**Beliefs about Aging and Later Life Health and Well-Being among the
Elderly in Taiwan**

by

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Dedication

To my parents, Dr. Kenneth K. Fan and Nancy Chiu, who always have believed in me and who taught me that anything was possible as long as I worked hard enough.

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Beliefs about Aging and Later Life Health and Well-Being among the Elderly in Taiwan

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Most of the empirical research on later life well-being in Taiwan has focused on demographic, structural factors and resources flow, and tended to ignore the meaning and beliefs older Taiwanese assign to aging and the consequences. In light of dramatic social transformation and the changing nature of elderly support, the empirical test of the values and beliefs about later life and their effects may provide a significant viewpoint in understanding why some older adults in Taiwan are healthier and live longer than others.

This project employs a national representative data drawn from the Survey of Health and Living Status of the Elderly in Taiwan in year 1996 and 1999. Beliefs about aging are conceptualized into several constructs and each is linked to three dimensions of health outcomes: physical health, mental health and mortality. In addition, I tested whether engagement in healthy habits, supportive social relationships, and greater involvement in social activities account for the associations.

Results suggest that general higher levels of positive beliefs about aging are predictive of improved health and longevity over time. When I divide general beliefs into positive and negative domains, I find that positive beliefs improve health largely through life style factors. While, compared to positive beliefs, negative beliefs seem to exert stronger effects on health through pathways well beyond an individual's lifestyle. That is, pessimistic views on aging may be more detrimental to health because domains related to negative beliefs (e.g., "boredom and uselessness" and "financial insecurity") directly challenge an individual's desires to search for a sense of meaning, purpose and security later in life.

Taken together, this study shows that positive beliefs about aging shape proactive behaviors and translate limited resources into opportunities, eventually leading to better health outcomes. In contrast, viewing aging in an unfavorable way may limit an individual's pursuit for a better life, and, in turn, impact health and well-being, regardless the actual resources possessed by the individuals. Therefore, this study suggests despite physically intact, generally active, and supportive relationships, the individual's subjective perception of aging is another important determinant in securing a healthy later life among elderly Taiwanese.

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Chapter 1: Introduction

This dissertation examines how perceptions about aging affect the later-life health and well-being of elderly individuals in Taiwan. Specifically, I investigated whether a positive or negative belief about growing old can predict the long-term physical and emotional health and survival of older adults. If so, do supportive social relationships, engagement in healthier behaviors, and greater involvement in social activities account for the relationship?

Much is known about the distribution of illness and disability in later life, their correlates, and their long-term trajectories and outcomes (George, 2001). However, more research is needed to investigate the social psychological aspects of aging, especially the process through which people develop and maintain a sense of meaning in their later life. George (2001) highlighted the current dilemma by stating that “survey research rarely views self-reports as attributions rather than fact and we worry more about what variables predict than what they mean or the processes that generate them in the lives of older people.” Indeed, structural and functional factors are important determinants of well-being later in life. Nevertheless, because research in the field has placed an emphasis on general social conditions, studies have largely ignored what growing old means to older adults and how those beliefs may be shaped by (or interact with) objective life conditions, and may eventually produce different health consequences. In fact, older individuals' values and beliefs about later life, such as whether it is hopeful, controllable, and meaningful, may determine how they arrange their later life and whether they take care of themselves; these factors, in turn, shape their resilience to the challenges associated with aging.

With the recognition that the experiences and meanings of aging are created within social and psychological constraints (Setterson et al., 2002), I examined how the individual beliefs (subjective perceptions) of the elderly may still change or mediate the effects of social structures (objective condition) on health and survival outcomes (Mirowsky et al., 2003). I focused specifically on the role of aging beliefs in later life to determine whether optimistic or pessimistic beliefs about aging among the elderly can explain why some people are physically and mentally healthier and live longer than others, beyond the influence of any physiological factors. In addition, I attempted to understand why a positive view of aging may be beneficial to health and survival. Specifically, I assessed whether lifestyle factors and psychosocial resources, including health behaviors, engagement in activities, and social support, are the mechanisms by which an optimistic belief toward aging leads to improved well-being.

ORGANIZATION OF THE DISSERTATION

Chapter 1 presents an introduction of the theoretical framework and background, and an overview of this dissertation. The theoretical rationale provided in Chapter 1 begins with a discussion of the link between aging, beliefs about aging, and well-being, including a sociological perspective on the potential difficulties of aging and the prospects for well-being later in life. I then explore what is known about aging in Taiwan. This chapter also includes a brief introduction of Taiwan's social and cultural context and demographic trends. Finally, I explain the potential contribution of this research.

Chapters 2–4 are separate but conceptually related, and examine the links between beliefs about aging and physical health, mental health, and mortality, respectively. Each chapter includes an introduction, a conceptual framework, theory, an analytical strategy, measurements, results, and discussion.

The dissertation concludes with Chapter 5, which summarizes the findings of Chapters 2–4 and discusses their significance for understanding the links between beliefs about aging and well-being in later life, in the context of Taiwan. The limitations of the study and directions for future research are also addressed.

SOCIOLOGICAL UNDERSTANDING OF AGING AND BELIEFS ABOUT AGING

Human actions can be understood in terms of their "meaning" (Idler, 1987), which is a world view that allows people to interpret and evaluate their existence and to make sense of their life experiences. Studies have generally shown that a search for meaning and purpose may be especially crucial and difficult as a person's future options narrow in later life (Erikson, 1997; Nilsson et al., 2003). Because of this, a growing body of research has examined how the search for meaning in later life can be the foundation for well-being; however, an individual's optimistic or pessimistic beliefs about aging, which are an important source of meaning, are largely unexplored.

An optimistic belief about growing old corresponds to a positive self-perception of aging and promotes a sense of meaningfulness in later life; it gives people a motive for valuing their existence and making sense of their life experiences. A pessimistic belief about aging, however, may impair active coping efforts and lead to a sense of meaninglessness, because it implies powerlessness and a pessimistic understanding of life events. Because of their functional deterioration and their awareness of approaching the end of their life (Takkinen et al., 2001), it becomes increasingly difficult for people of advanced age to maintain a sense of purpose in life and as regards future-oriented engagements (Erikson, 1997; Nilsson et al., 2003). Many studies have also documented a U-shaped age pattern in depression (e.g., Mirowsky and Ross, 1999; Schieman et al., 2001). The evidence suggests that middle age is the best time of life, and depression increases with age. If this age pattern exists, might a pessimistic view of aging among the

elderly partially account for an increase in the emotional problems of the elderly? Alternatively, does a positive outlook on aging boost the overall health and well-being of older people? Before closely examining the consequences of these beliefs about aging, it is helpful to outline several aspects of aging and well-being that have been analyzed in the existing literature.

AGING AND WELL-BEING

This section centers on the following question: does an individual's entry into a later stage of life imply that they have gained experience or simply lost their "edge" (Weiss et al., 2002, p. 11)? The view of "age as maturity" suggests that maturity comes with age (Mirowsky et al., 2003), and with that maturity comes a more orderly life, a healthier life style, greater life satisfaction, and a more positive self-image. This is because aging produces an accumulation of insight and practice in social and psychological skills, representative of the sum of a lifetime of experiences. Furthermore, according to Mirowsky and Ross (2003), older people report greater self-esteem, better control of emotion, and less nervousness and frustration. These findings provide evidence that the process of growing old leads to a cumulative increase in wisdom and experience--a trajectory to a harmonious and effective whole (Mirowsky et al., 2003).

The view of "age as decline" (Mirowsky et al., 2003) suggests that later life is likely to be characterized by decline, including an accelerating decline of health and physical functioning and a decline in mental ability. These dysfunctions may influence daily activities and an individual's ability to perform their previous role in society. This can generate a sense of powerlessness that leads to emotional problems (Schieman et al., 2001).

In addition, depression decreases with each year of additional education, and the effect of education grows successively larger with age (Mirowsky et al., 2003). Given

that older generations tend to have achieved a lower educational level than younger cohorts (the view of “age as generation”), poor education is likely to account for the higher level of distress seen among older people compared to their younger counterparts.

The view of “age as life cycle” emphasizes the idea that age marks an individual’s stage in their life cycle, with progression into old age sharply increasing the prevalence of retirement, widowhood, and other related losses of societal roles (Mirowsky et al., 2003). Moreover, the death of loved ones may force people to confront death and remind them of their own mortality, which, in turn, may diminish an individual’s sense of control and optimism toward life (Schieman et al 2001), and contribute to a higher level of depression in older age.

Taken as a whole, the trajectory of aging seems to lead to the development of a mature and disciplined individual self. However, given many of the stressful challenges related to advancing age, it is reasonable to speculate that older adults in particular may need a sense of purpose and guidance to bolster their resilience and help them to cope with difficult situations. An optimistic outlook toward their own aging enables the elderly to make sense of things that happen to them and maintain a sense of self (Krause, 1998), which may be an important personal resource for enhancing their emotional life and physical well-being. Since the meaning and trajectory of aging may differ across cultures, to provide the contextual foundation of this study, the next section presents a discussion relating to the cultural context of aging in Taiwan.

BELIEFS ABOUT AGING IN TAIWAN: WHAT WE DO AND DO NOT KNOW

This study focuses on Taiwan, a family-oriented society with a strong standard of obedience to and care for the elderly. According to traditional norms, the most important goal of an individual is to work hard and glorify the family, and eventually to pass their knowledge and family values on to the next generation. Old age is the time to enjoy the

family and freedom from obligations, which implies that an ideal late old age is a time of “relaxation,” while “under good care of children,” and “worry free (letting things take their own course).” Traditional sentiments toward aging may reflect both Confucian ideology and the formerly low rates of survival to old age; if it is relatively difficult to reach old age, any “expectation” or “planning” is not necessarily practical. The past and future improvements in mortality, however, have translated into increased survival rates to older age and thus an increase in the number of elderly over the past few decades (Hermalin et al., 2002). Today, the elderly are likely to have more years to spend in various roles and activities compared to previous cohorts. Yet, relatively little is known about how gains in life expectancy will affect society or the elderly themselves. Critical questions include the extent to which frailty and disability may mark these additional years (Settersson 2002), and how individuals perceive this time of their life, when they have fewer obligations and social expectations, but many more challenges related to the transition to late adulthood.

I have found no academic research in Taiwan that has examined the effects of an individual’s beliefs about their own aging. However, a telephone survey conducted in 1999 (N= 1142) by the most prestigious health magazine in Taiwan (*Common Health Magazine*), which investigated the perceptions of aging held by older Taiwanese individuals, produced several intriguing results. First, according to the survey, most elderly Taiwanese do not want to be centenarians, but instead would prefer to live only into their seventies. In addition, about one-third of the younger people (age 65 and lower) and one-fourth of the older people (older than 65) surveyed were very concerned or unhappy about their own later life. Furthermore, most had no plan for their life after retirement. The results are especially interesting in light of the recent trend toward a continuing increase in longevity. It may be that Taiwanese are generally less concerned

with the length of their life than its quality. Or perhaps there is a “prototype” associated with growing old in this culture that makes retirement planning unnecessary? A complementary argument is that Taiwanese, especially the elderly, are more oriented to the present, or do not dare to look forward, simply because the future is more unpredictable than it was at earlier stages in life, and no guidance is available.

A survey conducted by the Bureau of Health Promotion, Department of Health, Taiwan (2003), revealed that young people (15-17 year-old) and old people (>65 years old) are the most depressed groups in the population. About 8.4% of the elderly in Taiwan are seriously depressed, and the prevalence of depression among the elderly is substantially higher than the standard measured by the World Health Organization. This finding is comparable to a 1995 survey in the United States of aging, status, and sense of control (Mirowsky and Ross 1999), which found that middle age is the best time of life, and that the prevalence of depression increases with age. Is there some aspect to growing old that undermines well-being across cultures?

In both Western and Eastern cultures, the elderly are often portrayed by the media as a needy and vulnerable group. These negative images of the old as weak, dependent, and in decline may be internalized and ultimately become part of the individual’s self (Mead, 1934; Levy et al., 2002), so that predictions about how an individual will age are likely to become reality. However, the aging experience may be very different in Taiwan than in Western societies, because Taiwanese culture traditionally highlights the importance of care and respect for the elderly as teachers and guides (Weiss et al., 2002). Nevertheless, because of the dramatic social and demographic transformation, the cumulative evidence documents a shift in the power and authority of the generations, and the decline of family support of the elderly. These changes may impact traditional support systems and affect the expectations of elderly Taiwanese individuals about the

aging experience. The next section presents a detailed overview of this social and economic transformation over the last half century, and the implications of these changes for the well-being of the elderly.

SOCIAL AND DEMOGRAPHIC CHANGES AND THEIR IMPACT ON AGING

Taiwan has experienced a massive number of social and economic changes over the past century. These changes include a move from a family- and agricultural-based economy to a wage-based economy, the expansion of the educational system, and the completion of a demographic transition marked by a rapid fertility decline and a dramatic mortality decline, which has resulted in an aging society (Cornman, 2002). Several social, demographic, and cultural aspects of Taiwanese social context are likely to shape the results of this study. The next section will provide a general overview of Taiwanese society as well as the demographic transition.

Traditional family setting in Taiwan

When the Chinese first settled Taiwan in 1683, they introduced a patriarchal/patrilineal kinship system. Since then, Taiwanese society has been organized around a family system in which the life of an individual is an extension of their family lineage and a continuation of the lives of their ancestors (Lu et al., 2001). Therefore, traditional Chinese culture considers the family or clan to be the center of life. Individuals tend to minimize themselves to pursue the glorification of the whole family. This applies to a commitment to family responsibility and an emphasis on the harmony of kinship. In addition, within the context of family, age and generation are particularly important in identifying an individual's role and obligations in Taiwan (Cornman et al., 2003). For example, intergenerational relationships are governed by a strong norm of filial piety, and children are expected to be obedient and subservient to their parents and

to respect the elderly throughout their lives. As a result, offering support to one's parents is a moral obligation; it is considered ideal for a parent to co-reside with at least one married child (Cornman et al., 2003). In sum, family members remain central to both the emotional and economic support of the elderly.

Demographic transition and aging in Taiwan

High birth rates combined with falling death rates have significantly accelerated the rate of population growth during the last few decades. Taiwan completed its demographic transition between 1952 and the mid-1980s. The decline in mortality began during the Japanese colonial period as a result of the enforcement of public health regulations (Cornman, 1999). The crude death rate in 1952 was 9.9 per 1000 population, but by 1995 the death rate was 5.6 per 1000. Past and future improvements in mortality translate into increased survival rates among older age groups and an increasing number of elderly persons (Hermalin et al., 2002). In 1952, male life expectancy was 56.5 years, and female life expectancy was 56.3 years. By 2000, male life expectancy was 73.33 years, and female life expectancy had reached 79.04 years. The total fertility rate in 1952 was 6.6 children per woman. According to Chang et al. (1994), the decline in fertility during the 1960's was largely because of later marriage and declining fertility among older women as a result of increased educational and employment opportunities for women. By 1983, fertility had fallen below the replacement level; the total fertility rate was 1.8 children per woman and the net reproduction rate was 1.01 (Freedman et al., 1994).

These recent trends in fertility and mortality have had a dramatic impact on the age structure of Taiwanese society. In 1925, 42% of Taiwan's population was under age 15 and only 2.5% were 66 years old or older (Cornman 1999). The most significant change in the age structure occurred when fertility reached the replacement level in the

early 1980's. By 1985, the population of people under age 15 declined to 19.6% and the proportion of people aged 65 increased to 5.1% of the total population. As both fertility and mortality remain low, the proportion of individuals aged 65 years old or older continues to increase; by 2001, this group accounted for approximately 9% of the total population, and it is projected to account for approximately 20% of the total population by 2025.

Over the last 50 years, Taiwan has transformed itself into a highly industrialized and urbanized society. Between 1952 and 1988, per capita income increased nine-fold (Cornman et al., 2001), and the gross national product (GNP) grew by more than 8% each year. Life expectancy at birth has risen 20 years over the last half-century (Hermalin, 2002). Accordingly, the size of the population in Taiwan aged 60 and above more than tripled between 1970 and 1995, and it is projected to more than double again between 1995 and 2020. A strong sense of obligation for intergenerational support currently coexists with massive changes in key demographic and socioeconomic dimensions, such as lower fertility rates, longer life expectancy, and increased participation by women in the labor force (Biddlecom et al., 2002). Many of these rapid changes are anticipated to alter the patterns of familial support for the elderly (Hermalin 2002), including caregiving, ideational transformation (Western individualism), and intergenerational co-residence. It is not known how the elderly will respond to these changes, but the question is interesting and important. In light of such changes, obtaining a thorough understanding of the general view among the elderly about well-being in later life is an important and timely undertaking.

CONTRIBUTIONS OF THIS RESEARCH

Much of the empirical research on aging in Asia (especially in sociology) has focused on demographic and structural factors (Cornman, 2002) in shaping later life

health and well-being. Fewer studies have attempted to directly measure beliefs, attitudes, and values associated with how people view and interpret the process of aging. Given the difficulty of directly measuring values, and the methodological complexity of modeling beliefs, the scarcity of these studies is understandable. Nevertheless, in view of the rapid increase in longevity among elderly populations, it is important to ask whether the elderly consider those additional years to be “good years.” This study may provide invaluable insights into how the experience and meaning of aging is interpreted within the context of Taiwanese society, and the effects of those interpretations.

To get a full picture of how an individual’s beliefs about growing old can shape their future well-being, this study will link individual perception of aging to multidimensional health outcomes, including mental health, physical health, and survival. Examining different dimensions of health produces a better understanding of the health consequences of holding a pessimistic view toward later life. Comparing results across health measures within the same population also permits us to make stronger inferences about the differential impact of aging beliefs on various health outcomes (Cornman et al., 2003).

Previous research in the United States has shown that the characteristic experiences of later life are likely to include losses that disrupt our sense of purpose (Marris, 2002). These experiences include deteriorating health, retirement or loss of life-defining work, an “empty nest,” involuntary migration, and loss of loved ones. Therefore, some studies have suggested that older adults may be less integrated into society and have fewer opportunities to feel a sense of social control, competence, and optimism (e.g., Giarrusso et al., 2001). In addition, beyond the challenges that tend to cluster in later life, the stereotypes associated with growing old, such as uselessness and hopelessness, may prevent people from pursuing valued goals and from being engaged in

life. Some scholars believe that self-stereotypes of aging develop and become internalized throughout life, and, in turn, have a physiological outcome (e.g., Levy et al., 2002). Unfortunately, sociologists have paid relatively little attention to the social-psychological aspects of aging. This study contributes to the current debate by proposing that a positive view of aging can shape the health and well-being of the elderly.

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Chapter 2: Beliefs about Aging and Physical Well-Being among the Elderly in Taiwan

INTRODUCTION

In this article, I present an investigation of the consequences of one particular cognitive disposition that has received relatively little attention in the literature, namely beliefs about aging, among elderly in Taiwan. Are optimistic beliefs about aging associated with better physical well-being over time? To answer this question, I tested the hypothesis that older adults with greater levels of optimistic beliefs about aging would have better physical health. Second, I tested the hypothesis that optimists may enjoy better physical well-being because they tend to have more supportive social relationships, engage in healthy behaviors and are more involved in social activities.

A great deal of effort has been on understanding factors contributing to successful aging, what seems to be lacking, however, is a systematic analysis of the meaning individuals assign to aging, and how these beliefs shape their later life well-being. The values and beliefs people hold about later life, such as whether it is hopeful, controllable and meaningful may determine the way older adults arrange their later life, taking care of themselves, and in turn shaping their resilience in the face of stressful situations associated with growing old, such as decline in physical health and cognitive functioning.

Most of the empirical research on later life well-being among older Taiwanese has focused on demographic and structural factors as well as resources flow between generations. The present study sheds light on determinants of health later in life by proposing that an individual's subjective perception of aging may be another important factor in securing a healthy later life among elderly Taiwanese.

BACKGROUND

This study is based on large and national representative samples examining beliefs about aging among older people in Taiwan. The prime concern of this study stems from the rapid cultural, socioeconomic, and demographic changes in progress in Taiwan, where social and economic development seems to downgrade traditional values and transforms family structures dramatically.

Beginning in the early 1960s Taiwan was rapidly transformed from an agricultural society to an industrial economy, with associated changes in urbanization, increased educational attainment, occupational structure and income levels (Hermalin et al. 2004). Over the next 20 years, fertility continues to decline rapidly, and the total fertility rate has been below 2 since 1985. Meanwhile, mortality levels also dropped throughout the period, and there is a steady improvement in life expectancy. As a combined result, the population growth has slowed considerably and there has been a shift in age structure toward older ages, with 12 percent of the population aged 60 and older as of 2000, and a projected increase to 26 percent by 2031 (Hermalin et al. 2004).

Traditionally, based on Confucian philosophy, Chinese culture considers the family or clan to be the center of life. Intergenerational relationships are governed by a strong norm of filial piety, and children are expected to be obedient and subservient to their parents and to respect the elderly throughout their lives. Nevertheless, emerging literature suggests that with rapid population aging and dramatic social and demographic transformation, norms of filial piety and familial support of the elderly are facing challenges. Biddlecom et al (2002) pointed out “as younger cohorts with higher education and greater access to market sources of support (e.g. private pension), they may place higher values on independence, and family support (to the elderly) may decline in favor of state and market substitutes, suggesting the norms and attitudes about filial support are

facing challenges.” In other words, although filial piety to parents is internalized as a social norm, many of these rapid changes are anticipated to alter the patterns of familial support for the elderly (Hermalin 2002), including care-giving, ideational transformation (western individualism) and intergenerational co-residence. Meanwhile, ironically, increasing life expectancies among the elderly, according to the existing research, actually increases their needs to the family (e.g. Lu and Chen 2002). Dramatic socioeconomic development, coupled with rapid population aging, is placing strains on traditional family support (Cornman et al 2003), and pose an interesting and important question regarding how elders respond to these changes.

Cumulative evidence documents the decline of traditional support for older adults. Several qualitative studies in this regard show a gap between older adults’ expectations of a comfortable and caring later life and their actual experiences (e.g. Lu and Chen 2002). For example, Gallin (1994) examined the intergenerational power structure in rural Taiwan, and argued that development in Taiwan had shifted the balance of power between mothers-in-law and daughters-in-law, in the sense that to receive material support and outward respect, some mothers-in-law need to make themselves indispensable. With in-depth interviews, Lu and Chen (2002) examined family role adjustment and intergenerational relationships of the elderly in modern Taiwan. They revealed that although some elderly are more adaptive and liberal with changes associated with intergenerational support, most of them still maintain strong expectations of traditional filial piety. Only those who became frustrated with the reality reported no expectation of the repay of children. In addition, increasing numbers of elderly suicide and emotional problems further manifest the vulnerability of the elderly under two opposite forces: traditional socially constructed dependence on family in old age and declining family support to the elderly in modern time (Hu 1995).

Like many new industrial societies, Taiwan has fewer social programs to which elderly can turn for support compared to western settings (Cornman 1999). With the transforming nature of family support, increasing dependency ratio and developing social welfare programs designed for the elderly, this study aims to document the extent to which older adults' perceptions about aging are related to physical well-being over time.

CONCEPTUAL FRAMEWORK

The Meaning and Origins of Beliefs about Aging

Theoretical and Methodological Construct

What are beliefs about aging? Beliefs refer to cognitions that involve understanding and convictions about some aspects of reality (Simon and Marcussen 1999), reflecting both culturally shared systems and personal experiences, group membership and prevailing social climate (Simon and Marcussen 1999). Simon and Marcussen (1999) argue that beliefs may serve as a perceptual lens through which life events are interpreted and they influence the extent to which life events are considered beneficial or harmful. A positive belief about aging corresponds to an optimistic self-perception about aging, promotes a sense of meaningfulness in later life: a motive for people to value their existence and make sense of their life experiences. A negative belief about aging, on the other hand, implies powerlessness and a pessimistic interpretation of life events in later life.

An important conceptual and methodological issue of positive/negative beliefs about aging is whether they represent opposite poles of a single dimension or whether they are two distinct constructs (Brenes et al 2002). Studies used the Life Orientation Test (LOT: Scheier & Carver, 1985), the most widely used measure of dispositional optimism and pessimism seems to suggest that optimism and pessimism should be

evaluated independently because positive affect is not simply the absence of negative affect. Rather, the protective benefits of positive affect have been shown to be independent of negative affect (Ostir et al. 2004). Moreover, studies show that optimism is correlated with extraversion and positive feelings whereas pessimism with neuroticism and negative feelings (Robinson-Whelan et al 1997). Notably, according to the existing research, the separation between positive and negative construct may be particularly meaningful when studying an older population (Plomin et al 1992; Mroczek 1993), given that older people tend to approach problems more dualistically. That is, they are more likely to possess a black-versus-white view (Robinson-Whelan et al 1997), compared to their younger counterparts. Viewed in this light, this study conceptualizes optimistic beliefs and pessimistic belief about aging into two separate constructs.

The Cultivation of Optimistic/Pessimistic beliefs

A relevant issue follows: where do older adults' beliefs about aging come from? Namely, why some older people perceive aging more positively than others? Individual's beliefs about aging may come from many different sources, including older people's general evaluation toward past and present, physical and mental health, resources and support available, personality and social comparisons (with normative expectations). It is likely that personal goals and decisions (human agency) may also play an important role in the creation of meaning and purpose in later life, but it is important to note that, even personal choices are steeped in socially prescribed parameters, such that personal goals may or may not be obvious or feasible depending on where individuals are located (Hendricks and Hatch 2006). In fact, all those factors mentioned above that are likely to shape older people's beliefs about later life are at least partially a product of individual's social environment (Levy et al 2004). That is to say, individual's "beliefs about aging" is

more than a psychological attribute, it is still shaped by and contingent upon social capacities and constraints (Setterson 2002).

A significant number of studies have found that people with lower social status are more fatalistic than high-status individuals (e.g. Ross et al 1983) due to their recurrent experiences of failure and limited opportunities. In other words, individuals with greater level of optimistic beliefs about aging may be granted more potential options and resources throughout the life course than their less fortunate counterparts. For example, higher SES people tend to be healthier, possess greater economic security, have better access to preventive health care, live in safer neighborhoods and have larger social networks. The cumulative resources as capital over the life course provide more options and resilience in the negotiation of stressful life events in later life. Meanwhile, investment in human capital (e.g. education) may also promote “intellectual flexibility,” characterized by the ability to imagine a complex set of solutions to solve practical problems and expose people to open and creative ways of thinking (Mirowsky and Ross 2003). Both the cumulative resources and coping abilities are likely to decrease a sense of fatalism, and contributes to greater level of hope and optimistic beliefs. Therefore, taken together, it is reasonable to speculate that individual’s beliefs about aging may be still conditional on their social status.

Beliefs about aging and physical health

Why do Beliefs about Aging Matter? Evidence from PGCMS

Beliefs about aging may prove important for several reasons. This study focuses particularly on potential health benefits derived from an optimistic outlook toward aging. Studies show that search for meaning and purpose may be especially crucial and difficult when the future seems to narrow step by step in later life (Nilsson et al 2003). A positive

cognitive orientation toward aging may bring an important source of hope and purpose in late old age and have been proved to have some implications on health and well-being. Based on existing evidence, health and longevity in later life were found to be strongly related to individual's perceptions to aging, above and beyond social status and baseline health. Evidence in this regard came from a set of studies conducted by Levy and her colleagues. They developed their studies examining older adult's self perceptions of aging and a variety of health outcomes utilizing "Attitudes toward Own Aging" index, a subscale of the Philadelphia Geriatric Center Morale Scale (PGCMS: Liang and Bollen, 1983) based on the following five items: (1) "Things keep getting worse as I get older", (2) "I have as much pep as I did last year", (3) "As you get older, you are less useful", (4) "I am as happy now as was when I was younger", and (5) "As I get older, things are (better, worse or the same)." Their findings have demonstrated that older individuals with more positive self-perceptions of aging can live 7.5 years longer than those with lower self-perception on aging even after controlling for sociodemographic factors, loneliness and functional health. Moreover, Levy and colleagues (2002, 2004) show that older individual's perceptions about their own aging can beneficially predict health related outcomes, including functional health over time, personal control, will to live and likelihood of engaging in health behaviors.

Studies conducted by Levy and colleagues indeed provide invaluable insights to the understanding of the links between aging beliefs and later life well-being. However, this present study is distinct because of the following reasons: First, I conceptualize positive and negative aging beliefs as two distinct dimensions, rather than a single bipolar construct (i.e., PGCMS). As noted earlier, this approach has been demonstrated to be particularly meaningful among older adults. Second, in addition to the investigation of the effects of beliefs about aging on physical health, I also examine the mediating factors

responsible for the causal relationships, which have never been explored before. Third, not much has been written concerning the psychosocial aspects of aging in Asia, based on my understanding, this is the first study attempted to look at the health consequences of holding positive and (or) negative beliefs about aging in a non-Western setting.

Direct Link: Is an Optimistic or Pessimistic Belief about Aging related to Physical Health?

Despite the well-documented relationship between hope(hopeless) or optimism (pessimism) and health, to the best of my knowledge, relatively limited evidence comes from domain-specific empirical study on individual's optimistic/pessimistic perceptions of aging and the connection of health. Given that domain specific optimism/pessimism (e.g. optimistic/pessimistic beliefs about aging) is conceptually similar to the construct of dispositional optimism/pessimism, I draw from theories and empirical evidence linking dispositional optimism/pessimism to physical health. This current section will illustrate some of the most dramatic findings linking optimism and pessimism to physical health.

There is a fairly substantial literature on the relationship between optimism and physical health. Although the health outcomes and measures of optimism are diverse, these studies generally found that positive affects (optimistic beliefs) was associated with less risk of illness and injury and better health (Pressman and Cohen 2005). For example, Peterson et al. (1988) suggest that optimism is a significant predictor of physical health over a 35-year-period. That is, people who are more optimistic tend to enjoy better health than those who are more pessimistic. On the other hand, research has long demonstrated that greater hopelessness (pessimism) is associated with morbidity and negative expectations toward life problems (Nekanda-Trepka et al 1983). For example, Anda and colleagues showed that hopelessness predicted cardiovascular morbidity and mortality during a 12-year follow-up period independent of depression and other constructs.

Everson and colleagues (1996) also reported that hopelessness predicted mortality from all causes as well as specific causes including violence, cardiovascular disease and cancer.

Another line of research in this regard directly looks at the power of expectation and explanatory style in predicting older adult's health and longevity. Research suggests that older individuals are especially vulnerable to expectations (Neugarten 1996). For example, a study conducted by Borkan and Quirk (1992) examining the connection between expectation and recovery among the elderly with hip fracture demonstrated that those who reported more positive expectations for recovery were better able to walk three months after the hip fracture, controlling for severity and medical history. Nevertheless, it is not only expectation, but explanatory styles that predict subsequent illness or health. Peterson and colleagues (1988) found that individuals who interpret bad events in a pessimistic style have much higher health risk than those who understand events in a more stable and external term over a thirty-five year period.

In sum, a large body of literature in psychology attributes the effect of positive illusions on physical health to "placebo effects." That is, our stereotypes involve some magical process that an individual's beliefs or hope of a treatment may have a significant biochemical effect, which have some implications on physical health and vice versa (Taylor 1989). For now, as discussed in the earlier section, I could only locate one study (Levy et al. 2002) directly linking individual's beliefs about aging to one dimension of physical well-being (functional health). Although the empirical evidence is still limited, according to the theoretical rationale listed above, it seems reasonable to expect that the same health protective (detrimental) effects will apply to individuals with optimistic (pessimistic) beliefs about aging.

Indirect link: Why Beliefs about Aging may Increase or Degrade Physical Health Over Time?

Having reviewed some of the most dramatic direct evidence regarding why beliefs about aging may be associated with physical health, next section summarizes available evidence on the health benefits(detriments) derived from optimistic (pessimistic) beliefs about aging through three possible pathways: health behaviors, social support and activity involvement. As shown in the conceptual framework (Figure 2.1), in this study, I consider health behaviors, social support and activity involvement as potential mediators (partly) accounting for the relation between beliefs about aging (predictor) and physical health (criterion) (Baron et al. 1986).

For the presentation purpose, I divided the reviews of each mediating factor into two parts¹. First, drawing upon theories and empirical evidence linking dispositional optimism/pessimism to the potential mediator, I extend existing hypotheses to explore reasons concerning how a sense of optimistic or pessimistic belief about aging may be related to the given mediator. Second, to validate the association between the given mediator and physical health outcomes, I further presented detailed reviews of the existing studies demonstrating the proposed relationship. These strategies provided insights into the development of new theories that relates beliefs about aging to social integration (social support and engagement in social activities) and health behaviors. In addition, they also provide theoretical grounding in identifying the causal direction between beliefs about aging and physical health. The paragraphs below describe each possible connection.

¹ The only exception is health behaviors. There are already developed theories linking perceptions of aging to health behaviors. Therefore, I do not need to draw from theories of dispositional optimism/pessimism and health behaviors.

Beliefs about Aging, Health Behaviors and Physical Health

Beliefs about Aging and Health Behaviors

Reinforced health behaviors might link beliefs about aging to improved physical well-being. As noted earlier, utilizing PGCMS index, Levy and colleagues (2004) have demonstrated that older adults who felt positive about their own aging are more likely to engage in preventive health care over the next two decades, including eating a balanced diet, exercising, and following directions for taking prescribed medications. In other words, those with more positive self-perceptions of aging tend to believe that health problems are preventable in later life, and thus have more incentives to take better self care and avoid health risk actions (Krause et al. 2003). Likewise, although Levy and colleagues (2004) did not test the same hypothesis to those who felt pessimistic about aging, it seems reasonable to speculate that older adults holding pessimistic beliefs about aging may have less motivation to engage in proactive health behaviors because they tend to believe that health problems are inevitable in old age. In addition, since future seems to be unpredictable and hopeless, there is no purpose for those pessimistic older adults to work hard and orient themselves to the future.

Health Behaviors and Physical Health

It is self-evident that reinforced health behaviors are related to improved physical health status. People who stick to healthier personal habits, eating balanced low fat diets, staying fit, drinking moderately and not smoking are likely to enjoy better health outcomes. In addition, those who carry health insurance or visit the doctor regularly when needed (Ross and Mirowsky 2002) may also have lower risk of morbidity and mortality. Indeed, a recent study (Harris et al. 2006) suggests that by the time of early adulthood, a large proportion of American youth have begun the practices contributing to three leading

causes of preventable death, including smoking, obesity and alcohol abuse. Another longitudinal study (Lisette et al. 2004) examining the links between life style factors and healthy aging among elderly Europeans found that a healthy life style including diet and physical activity is related to stable self-rated health, a delay in functional dependence, and mortality. However, inactivity, smoking and lower quality diet increased mortality risk. In other words, as expected, a healthy lifestyle at older ages is related to a delay in the deterioration of health status and a reduced mortality risk.

Beliefs about Aging, Social Support and Physical Health

Beliefs about Aging and Social Support

Social support also may link beliefs about aging to better physical health. No previous studies attempted to link level of optimistic/pessimistic beliefs about aging to social support. Therefore, in this section, I started from outlining some of the most striking findings demonstrating the relationship between optimism/pessimism and social support.

Studies suggest one of the reasons optimists adjust to stressful life events (e.g. Krause et al 2002) more successfully than pessimists is due to their more extensive and supportive social networks (Brissette et al. 2002). In general, optimists have better ability to generate greater social support (Brissette 2002) because an optimistic outlook would seem to be attractive to potential relationship partners and useful for initiating social ties. That is, compared to pessimists, optimists are liked more (Carver et al. 1994), report longer friendship (Geers et al. 1998), have fewer negative social interactions (Lepore et al. 1999), and possesses greater levels of social support (Park et al. 1997).

Given the evidence linking optimism/pessimism to social support, one would anticipate that having greater levels of optimistic beliefs about aging may also foster the

development of supportive social networks due to the following reasons. First, since older adults with optimistic beliefs about aging tend to be more open-minded and cope more effectively with stressors (Krause et al. 2002), compared to their pessimistic counterparts, they are less likely to place excess demands on family and friends. Thus, members of their social networks may feel less pressure and become more willing to provide support. Second, elderly who feel optimistic about the future have more incentives to initiate new social ties and maintain good relationship with their social networks that have already established, which may lead to less negative interaction and higher quality of family and social relationships. Third, as noted earlier, optimists tend to report greater perceived availability of emotional support (Dougall et al. 2001). In other words, optimism and pessimism are likely to influence how individuals attend to and interpret others' behaviors and intentions (Srivastava et al. 2006). View in this light, elderly with positive beliefs about aging may also have a tendency to interpret the availability of social support in a positive and rewarding way and respond accordingly. Conversely, older adults with negative beliefs may be more hesitate to believe that one's social networks are able and willing to provide support if necessary. This is because an optimistic outlook would help people to see things in a more positive light, and vice versa. All of the above may possibly explain why optimistic beliefs about aging are instrumental in developing social networks and promoting greater perceived support.

Social Support and Physical Health

Supportive relationships may contribute to improved physical health due to several reasons. First, anticipated support may be an especially effective resource during stressful times (Krause 1997). The belief that others will provide support when needed reinforces a sense of security and bolster one's perceived ability to cope with demands (Cohen et al. 2000). Being able to work out problems may in turn enhance feeling of

control, which is associated with lower risk of morbidity and mortality (Krause et al. 1997). In addition, social support may protect against the pathological effects of stressful events by reducing the intensity of the biological stress responses (Ross and Mirowsky 2002). In other words, social support can improve health through reduced stress and enhanced immune function. Therefore, in sum, supportive relationships help individuals feel and become healthier.

The strongest empirical evidence came from the link between social support and mortality. Studies indicate that social support is protective against all-cause mortality (e.g. Blazar 1982). However, the evidence regarding the relationship between social support and physical health is mixed. Doegalas et al (1996) demonstrated that satisfaction with emotional support is significantly and positively related to self-reported health. Nevertheless, Sherbourne and Hays (1990) reported that perceived support is not related to physical health. One study of Taiwanese elderly found that although greater availability of social support is significantly associated with lower mortality, better subjective health and lower level of depression, in the presence of controls for prior health, the coefficient is significant only for depression (Cornman et al 2003).

Eaker (2005) argues that, inconsistencies in the findings surrounding social support and physical health probably result from different definition and measures of the concept across studies. Besides, the effects of social support may vary by characteristics such as age, sex, SES, cultural settings and stage of diseases and etc. Given the strong cultural norm and expectation that adult children (family) should care for their parents in old age, the perception of social support may play an especially central role in shaping older Taiwanese' later life well-being. Consequently, it is imperative to understand how older people develop their perceived availability of social support. My particular interest is in examining these processes in the context of individual's beliefs about aging. That is,

whether a sense of optimism toward aging foster the perceived availability of social support, and vice versa, above and beyond the “need” factor? Furthermore, does the level of anticipated support partially explain the health disparity among optimistic and pessimistic elderly in Taiwan?

Beliefs about Aging, Activity Involvement and Physical Health

Beliefs about Aging and Activity Involvement

Greater involvement in activities is likely to be another pathway through which optimistic beliefs about aging influence physical well-being. Although this notion is still new in the literature, individual differences in dispositional optimism versus pessimism about one’s future have been a subject of a great deal of research (Carver and Scheier 2001). In this section, I will focus on how a sense of optimism/pessimism toward later life affect individual’s level of engagement in social activities.

In general, favorable expectations for the future are believed to lead to continued engagement in life’s activities or pursuit of desired incentives. In contrast, unfavorable expectations are believed to lead to withdrawal from these activities and incentives (Scheier and Carver 1998). So far, the most prominent evidence came from studies on patients. For example, one study suggests that optimistic heart patients increased their exercise more in a cardiac rehabilitation program than did pessimists (Shepperd et al. 1996). Another study indicates that among cancer patients, pessimists reported higher levels of disruptions of social and recreational activities, compared to their optimistic counterparts (Carver et al. 2003). According to the results of these studies, it would be possible to argue that hopefulness promotes a sense of expectation that things will work out well in the future, and thus translate into greater efforts (Krause and Shaw 2003) and vice versa.

Having observed the link between optimism/pessimism and activities participation, I may now expand those theories into the relationship between beliefs about aging and engagement in activities. It is likely that with the expectation of a fulfilling and vigorous later life, older adults have more motivations to act on their expectation ---- participating in different kinds of social, leisure or productive activities. In contrast, if an individual believes that the future is hopeless and unpredictable, these feelings are likely to lead to withdrawal from meaningful and purposeful activities because beliefs shape actions (Ross et al. 2003) and pessimistic beliefs tend to impair the pursuit of valued goals.

It should also be noted that levels of activity participation in later life are often confounded by individual's health conditions. In addition, cultural values, and ideals of the society regarding what the older people should and should not do in later life may also dictate individual's level of activity engagement. However, the point I wish to make is that, in addition to individual's health status, societal values, older individual's perceptions and expectation about the way aging is experienced is also playing a central role in shaping his/her engagement in social activities.

Activity Involvement and Physical Health

A wealth of studies show that embeddedness in social activities may bring health benefits through cultivating individual's mind and physical mobility as well as reducing biochemical markers of stress (Lennartsson and Silverstein 2001; Cornman et al. 2003). In addition, involvement in leisure and productive activities may also provide health enhancing benefits because they are often performed within the context of social relationships (Lennartsson and Silverstein 2001). It is well-documented that interpersonal relationships and fulfillment of social roles lead to lower morbidity and improved subjective health (e.g. Seeman et al. 1987). Studies conducted in Western populations

generally show a positive association between involvement in social activities and health. For example, Sugisawa et al (1994) found a strong positive impact of participation in social organizations on mortality, functional status and self-rated health. The evidence is even more striking in Taiwanese context. Cornman et al (2003) found that engagement in social activities is one of the most critical factors in promoting health among elderly Taiwanese. Results of their study further suggest that the health protecting effects of social activities may be even stronger than marital status and contact with friends.

However, engagement in activities (especially social activities) may not always be beneficial to health. Interpersonal ties in formal or informal settings (such as church, organizations or other group activities) may not always function smoothly, and interpersonal conflicts can sometimes have long-term detrimental effects on health and well-being (Krause 2006). In addition, certain types of activity, such as recreational gambling, has been found to be associated with alcohol abuse, depression and other adverse health outcomes among older adults (Rani et al. 2004). Nevertheless, disregard some of the exceptions addressed above, most of the leisure, hobby and social activities examined in this study have been demonstrated to be beneficial to later life health and well-being in general.

RESEARCH QUESTIONS AND HYPOTHESES

In developing my research questions and hypotheses, I organized my investigation around three guiding questions. First, do optimistic or pessimistic beliefs about aging promote or degrade older people's physical health overtime? Second, do the relationships between beliefs about aging and physical well-being differ for optimistic beliefs vs. pessimistic beliefs? Third, do health behaviors, perceived social support and engagement in social (leisure) activities explain the association between optimistic/pessimistic beliefs about aging and physical well-being?

To answer these three questions, drawing upon available evidence, I propose the following three hypotheses:

1. An optimistic beliefs about aging is positively associated with higher levels of self-rated health overtime; whereas, a pessimistic beliefs about aging is positively associated with lower levels of self-rated health overtime.
2. The links and magnitude between beliefs about aging and physical well-being differ for optimistic beliefs vs. pessimistic beliefs.
3. Health behaviors, perceived social support and engagement in social (leisure) activities (partially) mediate the effects of optimistic/pessimistic beliefs about aging on self-rated health.

DATA

This study employs a national representative data drawn from the Survey of Health and Living Status of the Elderly in Taiwan in year 1996 and 1999, a joint project between University of Michigan and the Bureau of Health Promotion in Taiwan. This is a long term survey collected from 1989 until now in a three-year interval. The sample is a nationally representative sample of men and women aged 60 and over. The sample was drawn as a multistage probability sample: 1) 56 townships (primary sampling units or PSUs) were randomly selected, 2) Within each PSU, blocks were randomly selected, and 3) Within each block, two eligible respondents were selected. Both PSUs and blocks were selected with probabilities proportional to size of the population in the sampling unit. Initial interviews started from 1989 (response rate of 91.8%) with 4049 respondents aged 60 and over and were followed up in 1993 (response rate of 91.0%) and 1996 (response rate of 88.9%). The 1996 follow-up remained 2669 respondents, who were then reinterviewed in 1999 with a response rate of 90.1%. Because information on beliefs about aging was only available in 1996 interview, all measures used in the analysis

presented below came from the 1996 survey except for the outcome variable (i.e., 1999 self-rated health). After using listwise deletion of missing values to deal with item nonresponse, complete data were available for 1850 respondents. Taken together, this study tracks the health condition of the 1850 elderly respondents in 1996 over a three year period and analyzes the association between beliefs about aging and health outcomes. Proxies were excluded from the analysis because they were not required to answer any of the self-reported questions such as self rated health and beliefs about aging.

MEASURES

Key Independent Variable

Beliefs about Aging

The beliefs about aging scale, is a multi-item self-report measure designed to capture the elderly's cognitive tendency and general evaluation toward aging (see Table 2.1). It has two components: positive beliefs about aging and negative beliefs about aging. *Positive beliefs about aging (PBAA)* are measured by the degree of agreement to the following questions as regard to advantages of growing old: a) "Can be your own boss; do not have to listen to others' directions"; b) "Can live a more relaxed, leisurely life"; c) "Can spend more time with spouse"; d) "Can spend more time with children"; e) "Can spend more time taking part in social activities"; f) "Can have more time traveling"; g) "Can have more time to pursue what you like to do." Responses to these perceived advantages are coded "completely unimportant" (1), "not too important" (2), "somewhat important"(3) or "very important" (4), with "not applicable," or "never thought about it" coded as missing. Responses were averaged across non-missing items with a higher score indicates greater levels of positive (optimistic) beliefs. The overall alpha reliability is .78.

Negative beliefs about aging (NBAA) are measured by the degree of concern to the following four questions. a) “Too much time on hands; life is more boring”; b) “No way to do useful or constructive things.” c) “Income is insufficient” and d) “Saving devaluate while cost of living rises.” Responses to these questions are “no concern” (1), “a little concern” (2), “some concern” (3) or “great concern” (4). Responses were averaged across non-missing items with higher score indicates greater levels of negative (pessimistic) beliefs. The overall alpha reliability is .74. Noticeably, under consideration, the NBAA exclude the following two disadvantages: a) “the decline of health²” b) “will miss old colleagues.³”

To be consistent with previous studies (e.g., PGCMS), a composite measure of beliefs about aging was also created to assess older adults’ general tendency with regard to aging. The scale of *general (aggregate) beliefs about aging (GBAA)* is a continuum, ranging from pessimistic beliefs to optimistic beliefs (1-40⁴), developed by subtracting the sum of the positive beliefs score from the sum of the negative beliefs score⁵. That is, a higher score for positive beliefs and a lower score for negative beliefs will result in a larger final score (closer to the high end of the belief spectrum), indicating greater levels of general optimism. A lower score in positive beliefs and a higher score in negative beliefs will result in a lower final score (closer to the lower end of the belief spectrum), suggesting lower levels of general optimism, and greater pessimism. The overall alpha reliability is .69.

² In consideration of possible confounding effect of baseline physical health status, I decided to remove this item from the negative belief index.

³ Holding a paid job is not a shared experience by most of the respondents in this study. Therefore, I decided to remove this item.

⁴ The original range for GBAA is from -14 to 25. For presentation purpose, it was transformed to 1-40.

⁵ I have tried several different ways to create the GBAA scale, including standardization. But, the results are basically identical across different construct.

In addition, to capture different dimensions of aging beliefs, I further divide the GBAA into five subscales: leisure, family, activity and autonomy, boredom and uselessness and financial insecurity. The PBAA was broken down into three domains: *leisure*, the score of item b; *family*, the average score of item c and d ($\alpha = .79$); *activity and autonomy*, the average score of item a, e, f and g ($\alpha = .67$). The NBAA was also divided into two domains. *Boredom and useless* is measured by the average score of item a and b ($\alpha = .68$); *Financial insecurity* is measured by the average score of item c and d ($\alpha = .89$).

Dependent Variable

Self-Rated Health (1996 & 1999): Self-rated health is a broad evaluation of respondent's overall health, an important predictor for future health outcomes, especially morbidity and mortality (McGee et al. 1999). The measure of self-reported health combines the subjective experiences of acute and chronic diseases, fatal and nonfatal diseases, and general feelings of well-being (Ross et al. 2002). It correlates highly with physician's assessment, and predicts mortality, above and beyond diseases, clinical exam, physical disability and health behaviors (Idler et al. 1997). Poor self-assessment of health is associated with the presence of chronic disease, functional limitations, hospitalization and unhealthy behaviors (Cornman et al. 2003). In this study, self-rated health captures respondents' own assessment of their overall level of health with one single question, "Regarding your state of health, do you feel it's:" "poor"=1, "not good"=2, "fair"=3, "good"=4 or "excellent"=5. A higher score represents better self-rated health.

Mediators

Health Behaviors: I control for several health behaviors that can have life-long influences on health and mortality. It is likely that a sense of optimism toward one's own

aging increase the likelihood that a person will develop a healthy life style (Taylor 1989), and better self care, which may have some implications on later life health and well-being. Health behaviors include (a) "alcohol consumption," (b) "cigarette smoking," and (c) "exercise." Excessive alcohol consumption and cigarette smoking have been well-recognized as two major health risk behaviors. In addition, regular exercise is also demonstrated to be an important factor in shaping health and well-being among the elderly. Responses for alcohol consumption and cigarette smoking were dichotomized into two sets of dummy variables with no alcohol consumption⁶ or no smoking as reference group. Frequency of exercise was measured by one single question: "Do you exercise regularly?" Response categories range from "no (coded 0)," "less than twice a week(coded 1)," "three to five times a week(coded 2)," "over six times a week(coded 3)." Higher number indicates a greater frequency of exercise.

Perceived Social Support: The measure of perceived support was included because of the following two reasons. First, previous research has shown that perceived support has a profound impact on health and well-being (e.g., Cornman et al 2003). In addition, it is possible that individuals with greater hope about later life well-being tend to have better assessment about the availability of support. Respondents were asked to rate the availability of three type of social support from family and friends: willingness of others to listen when the respondents need to talk, level of caring or love given to the respondent, and the reliability of others to provide sick care ($\alpha = .78$). Response categories were recoded into the following five categories: "very poor(coded 1)," "poor(coded 2),"

⁶ Research generally suggests that the effects of alcohol consumption on physical health depend on the amount of consumption and past problems with drinking (Rogers et al. 2000). However, because of the following two reasons, I decided to keep "current drinkers" as the indicator of drinking. First, most of the current drinkers (approximately 19%) drink rather modestly, and thus it is hard to further breaking down into different amount (frequency) of consumption. Second, in an additional analysis (not shown), although past drinkers (currently not drinking) reported greater physical problems than current drinkers, drinking history is not associated with self-rated health over time.

“satisfactory(coded 3),” “good(coded 4),” “very good(coded 5).” A higher score indicates greater levels of perceived support.

Daily Activities: The construct of daily activities concerns different levels of participation in all kinds of social, leisure and productive activities among older adults. An optimistic view of aging may direct people to more activities to assure themselves of a beneficial and fulfilling later life (Taylor 1989). Daily activities was measured by whether the respondents take part in the following 10⁷ activities during leisure time (a) “Watch TV/videos,” (b) “Listen to radio/tapes,” (c) ”Read newspaper, books, magazine, novels, etc.” (d) ”Play chess or cards (including mah-jongg),” (e) “Chant sutras; Pray and burn incense; go to temple to offer incense or study sutras; pray; go to church,” (f) ”Chat with relatives, friends, or neighbors; drink tea socially,” (g) ”Raise flowers; tend garden; practice garden art or floral arrangement,” (h) ”Group activities like singing groups, dancing, t’ai chi, or karaoke,” (i) “Interests or hobbies: play instruments; paint; woodworking; collecting stamps or other things,”(j) ”Attending concerts, Taiwanese and Peking opera.” Activity participation is calculated by the number of activities respondents take part in ranging from 0 to 10. That is, the more activities respondents’ are involved in, the higher the score.

Sociodemographic Variables

Sociodemographic factors are controlled in the equations to rule out the possible selection effect (individuals with higher social status or other advantaged characteristics may perceive aging more positively than others).

Age is coded in number of years.

Sex is represented by a dummy variable contrasting female (coded 1) with male (coded 0).

⁷ Two types of exercise-related activities were removed

Urban is coded as a dummy variable contrasting respondents living in urban area (coded 1) from those living in town or rural area(reference).

Education is coded in number of years of formal schooling (0-17). Beyond year of schooling, a substantial number of respondents reported to have no formal education, yet literate. In a separate analysis (not shown), I found that these group of people are much better off ⁸than those with no formal education and illiterate. Therefore, I create another category for “no education but literate (coded 1)” in between “no education (coded 0)” and “with formal education (coded 2-17).” Because of this, for those with at least one year of schooling, additional one year was added in order to have “no education but literate” coded as 1.

Marital Status is represented by a dummy variable contrasting those currently married (coded 1), with those who are separated, single, divorced or widowed (reference category).

Employment Status is measured by whether respondents were employed either full time or part time (coded 1), or not (coded 0, including those who are not employed at all, home makers, or those with informal jobs such as helping out with family farm or business).

Economic Hardship is measured by one single question: “Do you (and your spouse) have enough money or any difficulty meeting monthly living expenses or other expenditures? “ Responses were “enough money, with some left over” (1), “Just enough money, no difficulty” (2), “some difficulty” (3), “much difficulty” (4), “enormous difficulty” (5). A higher number represents greater levels of economic hardship.

⁸ Individuals with no formal education, but literate reported a higher level of positive beliefs about aging, and better self-rated health than their illiterate counterparts.

ANALYTICAL STRATEGY

I model the effects of beliefs about aging on subsequent self-rated health over a 3-year period (i.e., 1996–1999). First, I examine the relationship between older adults' general beliefs about aging and their subsequent physical health using the GBAA scale. Second, to investigate how positive beliefs (PBAA) and negative beliefs (NBAA) are related to physical well-being over time, I divide the GBAA into positive and negative domains, respectively. Third, given that the PBAA and NBAA measures comprise several different aspects of aging (family, leisure, activity and autonomy, boredom and uselessness, and financial insecurity), I further link each dimension to subsequent physical health outcomes. This allows me to assess whether a particular aging belief is particularly important to physical well-being later in life, and if so, whether the effect can be explained by lifestyle factors.

I estimate seven models for the outcomes of self-rated health (Tables 2.3-2.5). Model 1 includes only beliefs about aging to test the net effect of positive and negative beliefs on subsequent health outcomes. Model 2 incorporates health status at the beginning of the 3-year interval to determine whether any of the effects that are revealed in Model 1 are diminished or eliminated in the presence of baseline health controls. For example, respondents in poor health are more likely than their healthier counterparts to have a negative assessment of their own aging. Model 3 includes sociodemographic controls to test whether such characteristics may account for the association between beliefs about aging and self-assessed health. Models 4–6 adjust for health behaviors, perceived support, and daily activities (activity engagement), respectively. These three models examine the degree to which each lifestyle factor accounts for the link between beliefs about aging and health status. Model 7 is the full model and includes all of the variables. Because the dependent variable, self-rated health, is an ordinal variable, I use

ordered logistic regression to examine the association between aging beliefs and self-rated health. Table 2.6 is a summary table linking each of the sub-domains of aging belief to subsequent self-rated health. Model 1 examines the gross effect of a particular aging belief on self-rated health with only the adjustment of sociodemographic characteristics. Model 2 incorporates all of the variables introduced in the analysis. Taken together, all of the models are shown as cumulative odds ratios. The coefficients in Tables 2.3–2.6 represent the effect of a unit change in the associated independent variable on the score.

RESULTS

Table 2.1 presents the items that were used to construct the measures of aging beliefs. Descriptive statistics for all variables are presented in Table 2.2. There were 1850 respondents, ranging in age from 67 to 94 at baseline; approximately 45% were female, 62% were married at the time of the study, and the average number of years of schooling was less than 5 years.

General Beliefs about Aging and Self-Rated Health (Table 2.3)

Table 2.3 presents the cumulative odds ratios from a series of ordered logistic models that estimate the effects of GBAA on self-rated health. In line with previous studies, Model 1 shows that individuals with a unit increase in the belief spectrum (i.e., more optimistic beliefs) have significantly higher odds of reporting better self-rated health over time (OR = 1.090, $p < .0001$). Likewise, individuals with greater levels of pessimistic beliefs (i.e., in the lower end of the belief spectrum) are at a significantly higher risk of reporting poor self-rated health in the follow-up period. This pattern holds across all seven models. Furthermore, baseline physical health, sociodemographic characteristics, and lifestyle factors (health behaviors, perceived support, and daily activities) cannot account for this pattern. The GBAA results clearly suggest that greater

levels of general optimism and lower pessimism (i.e., scoring higher on the overall scale) are prospectively related to superior self-rated health among the elderly in Taiwan. However, I am unable to gauge the precise nature of beliefs about aging and their effects on the physical well-being of the elderly without examining positive and negative beliefs separately. Therefore, GBAA is further divided into the positive and negative domain, and each is linked to self-rated health in the next step of the analysis.

Positive and Negative Beliefs about Aging and Self-Rated Health (Tables 2.4 & 2.5)

Tables 2.4 and 2.5 present cumulative odds ratios from a series of ordered logistic models. As expected, Model 1 in Table 2.4 suggests that a unit increase in positive beliefs is significantly associated with an increase of approximately 54% in the likelihood of reporting a higher level of self-rated health over a 3-year interval. In contrast, Model 1 in Table 2.5 indicates that a unit increase in negative beliefs is significantly associated with a 40% decrease in reporting a higher level of self-rated health.

Model 2 in Tables 2.4 and 2.5 takes into account possible health selection effects by incorporating the initial health status. Although the initial health status exerts considerable influence on an individual's self-assessment of aging, substantial effects of positive and negative beliefs about aging on subsequent self-rated health are evident (OR = 1.268, $p < .001$; OR = .762, $p < .0001$), even after the adjustment for initial health status.

Not surprisingly, the introduction of sociodemographic characteristics in Model 3 (Tables 2.4 and 2.5) significantly attenuates the effects of beliefs about aging on self-rated health. The mediating effects of sociodemographic characteristics are particularly salient for positive beliefs; a superior sociodemographic characteristic accounted for a large part of the link between positive beliefs and self-rated health. Indeed, a separate analysis (not shown), found that individuals who were younger, married, well-educated,

and with lower levels of economic hardship tended to report significantly greater levels of positive beliefs about aging. Taken together, urban/rural residence, sex, age, and level of economic hardship account for most of the observed association linking beliefs about aging to self-rated health.

With Models 4–6, I seek to explain the possible mechanisms of this association by introducing three types of potentially mediating lifestyle factors: health behaviors, perceived social support, and activity engagement, respectively. All three models control for baseline self-rated health and sociodemographic characteristics. Several interesting findings emerge when comparing the coefficients of the positive and negative beliefs in Models 4–6 to the baseline model (Model 3). For positive beliefs (Table 2.4), daily activities account for most of the association with subsequent self-rated health (OR = 1.113, $p = \text{NS}$), regardless of baseline health and sociodemographic controls, whereas health behaviors and perceived support have little bearing on the relationship. However, of the three potential mediators, health behaviors display the strongest mediating effect on negative beliefs (OR = .830, $p < .01$); perceived support and activity engagement have almost no bearing on the relationship between negative beliefs and poor self-rated health. Overall, no persistent mediating patterns are found in the effects of positive and negative beliefs on self-rated health. Model 7 (the full model) indicates that better initial health status, sociodemographic characteristics, and greater levels of activity engagement fully account for the health benefits among individuals with more optimistic beliefs about aging. However, although the effects of negative beliefs on physical well-being are reduced by adjusting for poor baseline health, sociodemographic characteristics, and health behaviors, significant differences in self-rated health remain. Overall, it is likely that individuals perceive positive and negative beliefs about aging simultaneously; however, compared to the positive domain, the negative domain seems to have a stronger

effect on health, regardless of other relevant factors. This pattern holds even with the control of positive beliefs (not shown). In the next step of the analysis, I further divide PBAA and NBAA into several subscales (dimensions) to determine the aspects of aging beliefs that are responsible for long-term effects on physical well-being.

The Five Dimensions of Aging Beliefs and Self-Rated Health (Tables 2.6 & 2.7)

The positive and negative belief indices are broken into five domains, “family,” “leisure,” “activity and autonomy,” “boredom and uselessness” and “financial insecurity” (see Tables 2.6). As revealed in Model 1 of Table 2.6, with only the adjustment of sociodemographic characteristics, all five dimensions of aging beliefs are significantly related to subsequent health. Among them, the positive beliefs of “activity and autonomy,” and the negative beliefs of “boredom and uselessness” appear to be most influential to the physical well-being later in life. Model 2 shows that, with the adjustment of baseline health and those three mediators introduced in the analysis, only negative domains of aging, such as “boredom and uselessness,” and “financial insecurity” remain significant (OR= .839, $p < .01$; OR= .920, $p < .1$). In other words, domains related to optimistic beliefs influence health mainly through life style factors. While, the pessimistic view of aging seems to exert a profound impact on physical well-being well beyond an individual’s personal characteristics, health status, and lifestyle.

DISCUSSION

My aim was to examine whether an individual’s perception of aging helps to shape their physical well-being in old age. I used a multidimensional framework to explore how an individual's outlook and subjective beliefs about growing old influence their self-rated health over time later in life.

General Beliefs and Self-Rated Health (Overall Pattern)

Overall, individuals with higher GBAA scores (relatively higher optimistic and lower pessimistic beliefs) were significantly more likely to report better self-rated health in the follow-up period. The strong significant association remained after controlling for baseline physical health, sociodemographics, and lifestyle factors. These results agree with those of other studies showing that higher positive perceptions in the elderly predict a variety of physical health outcomes, above and beyond relevant factors.

Optimistic or Not Pessimistic?

Results of the GBAA scale confirm the substantial health-promoting effects of a relatively positive perception of aging. However, because the elderly tend to view aging more dualistically and independently (see the conceptual framework) than other age groups, it may be that individuals with negative views of aging also report positive beliefs. In an additional empirical test, positive and negative beliefs were found to be negatively but weakly correlated, suggesting that among the Taiwanese elderly, PBAA and NBAA are independent variables and not simply the polar opposites of the same trait. To boost physical health, is it therefore more important to be optimistic or to *not* be pessimistic? Both are important, but the evidence has stronger support for the latter argument: when optimism and pessimism are explored separately, pessimistic beliefs are significantly and robustly related to a higher risk of poor physical health over time, irrespective of other variables. This pattern does not hold for positive beliefs because most of the observed associations between positive beliefs and subsequent health are explained fully by the advantages offered by the respondent's personal characteristics (healthier, younger, married, better educated, and with a lower level of economic hardship) and proactive lifestyle (higher levels of engagement in activities).

The Health Detrimental Effects of Viewing Aging as “Boring and Useless”

Results generally support the argument that a pessimistic outlook on aging has a more robust effect on physical well-being than an optimistic one, after multivariate adjustments. These findings are consistent with those of previous studies (Schulz et al. 1996; Robinson-Whelen et al. 1997; Bernes et al. 2002) that found that pessimism serves as a significant predictor of various health outcomes in the elderly. Nevertheless, it remains unclear why negative beliefs tend to exert stronger effects on physical well-being than do positive beliefs. Because PBAA and NBAA each taps different domains of aging beliefs, it may be that relative to positive domains, the negative belief domains are more likely to influence later life quality and well-being. Hence, a pessimistic outlook may particularly reflect an individual’s lack of resources or insecurity. Although this hypothesis cannot be tested directly, breaking down PBAA and NBAA into five separate dimensions can assess whether a specific domain is more relevant than others to physical well-being over time. As expected, all five domains (leisure, family, activity and autonomy, boredom and uselessness, and financial insecurity) significantly predict self-rated health over a 3-year period. Moreover, consistent with my hypotheses, the links between positive domains of aging are generally fully explained by the mediators introduced in the analysis. Only the pessimistic belief of “boredom and uselessness” remains strong and significantly related to prospective self-rated health. These results imply that the unexplained, substantial link between negative beliefs and self-rated health largely arises from the pessimistic view of aging as “boring and useless.” It is reasonable to argue that “emotional states” at baseline may be responsible for this observed pattern. In other words, persons with greater emotional problems are more likely to view the process of growing old as “hopeless” and “useless,” and such pessimistic views may, in turn, influence physical well-being over time. In an additional analysis (not shown), I

found that the inclusion of baseline depression indeed explains the link between “boredom and useless” and subsequent poor self-rated health by a large amount, but the association remains strong and significant.

Therefore, perhaps, the health protective (detrimental) effects of believing something good (bad) will happen is not purely psychological, but also biological. Evidence suggests that the positive illusions trigger the release of a number of chemicals in the body that may promote healing (e.g., the placebo effects) and improve mood (Taylor 1998). While, chronic stressful experiences (thoughts) cause a chain of physiological reactions across the neuroendocrine, sympathetic nervous, immune and cardiovascular system, which may accelerate the wear and tear of the body in the long run (Weinstein et al. 2003). An experiment conducted by Levy et al. (2002), demonstrated that older individual’s self-stereotypes of aging can strongly impact their memory performance, walking and other physical functioning. Likewise, viewing one’s own aging as “hopeless” and “useless” may also result in poor physical health by triggering a complex set of biochemical effects.

Why Beliefs about Aging Matter to Physical Health: The Mediators

What accounts for the observed associations between beliefs about aging and subsequent physical well-being? In addition to advantaged social status and better initial health, positive beliefs improve physical well-being by motivating individuals to engage in a variety of leisure and/or social activities. Active participation in a range of daily activities, especially in later life, may strengthen physical functioning and stimulate cognitive ability (thus preventing dementia). It may also reduce a sense of loneliness and meaninglessness by cultivating social relationships and helping to develop deep bonds with family and friends. It is well documented that interpersonal relationships and the fulfillment of social roles lead to lower morbidity and improved subjective health (e.g.,

Seeman et al. 1987). In addition, health behaviors (primarily lower levels of exercise) partially explain why negative beliefs are particularly detrimental to physical well-being over time. More specifically, pessimism toward aging may produce less incentive to take care of oneself, including getting regular exercise or engaging in healthy habits. All of these factors are strongly predictive of physical illness and mortality (Rogers et al. 2000). However, even when controlling for older adults' health behaviors and other relevant factors such as perceived support and engagement in activities, these variables alone do not fully explain the detrimental effect of pessimistic beliefs about growing old on physical health, which suggests that other mechanisms not examined in this analysis may be involved.

For example, previous research on aging and well-being shows that the characteristic experiences of later life are likely to include deterioration of health, loss of life-defining work, an empty nest, involuntary migration, or loss of loved ones (Marris 2002 p. 23). Pessimism about aging may lead to less adaptive coping strategies (Gretchen et al. 2001) in the face of stressful situations, which may in turn lead to stress, anxiety, and other physiological dysregulation. Pessimistic beliefs about aging may also impair an individual's sense of personal control, which is the extent to which an individual believes that they can actively manage their life (Mirowsky and Ross, 2003). Individuals who believe that they cannot exert authority over or influence their own fate may have less incentive to pursue valued goals and to have an engaged life. They may also lack the motivation for preventive health care and regular exercise. A belief in external control and powerlessness is a well-documented possible cause of physical illness and mortality. Furthermore, as noted earlier, a negative perception of aging may also affect physical well-being through other unmeasured physiological pathways. All of these possibilities are worth investigating in future research.

Conclusion and Limitation

Low levels of disease and disability, high physical and cognitive functioning, and active engagement with life have been widely considered as the most important criteria for “successful aging” (Rowe and Kahn 1998). However, individual’s subjective perceptions of well-being are a part of successful aging is largely unexplored (George 2006). My results suggest that negative beliefs about aging, particularly a belief in “boredom and uselessness,” may have detrimental effects on physical health. In fact, an individual’s perception of aging seems to exert a stronger effect on their physical well-being than their perceived social support and other relevant factors. My results contribute to the aging literature by showing that well-being later in life may be rooted in how individuals view their own aging.

Several limitations of this study warrant discussion. First, I focused on the elderly population of Taiwan aged 67 years and older. Previous research suggests that being older increases the likelihood of having traits associated with survival (Mirowsky and Ross, 2003). Consequently, those who are most pessimistic about aging may have been excluded from our sample by selection due to mortality (i.e., those who are most pessimistic may die earlier than their less pessimistic counterparts, and vice versa). Therefore, the magnitude of negative beliefs may be understated. Meanwhile, the association between positive beliefs and health is likely to be inflated. Second, some positive elements of aging are not included in the measure of positive beliefs due to limitations in the data. For example, according to Mirowsky and Ross (2003), growing old may suggest more experience, accomplishment, and maturity. By not including these positive aspects of aging, we may be missing the full picture.

Table 2.1. Measures of Beliefs about Aging

| Beliefs about Aging | Domains | Item Description |
|-----------------------------------|------------------------------------|---|
| Positive (Optimistic) | <i>Family</i> | Can spend more time with spouse |
| | | Can spend more time with children |
| | <i>Leisure</i> | Can live a more relaxed, leisurely life |
| | <i>Activity and Autonomy</i> | Can be your own boss; do not have to listen to others' directions |
| | | Can spend more time taking part in social activities |
| | | Can have more time traveling |
| | | Can have more time to pursue what you like to do |
| Negative (pessimistic) | <i>Boredom and Uselessness</i> | Too much time on hands; life is more boring |
| | | No way to do useful or constructive things. |
| | <i>Financial Insecurity</i> | Income is insufficient |
| | | Saving devaluate while cost of living rises |

Table 2.2. Descriptive Statistics (1996-1999, N= 1850)

| | Range | Mean(%) |
|-----------------------------------|-------|---------|
| Beliefs about Aging | | |
| General | 1-40 | 22.76 |
| Positive | 1-4 | 2.51 |
| Negative | 1-4 | 1.82 |
| Sociodemographic Variables | | |
| Urban | 0-1 | 35.89% |
| Female | 0-1 | 44.82% |
| Age | 67-94 | 72.66 |
| Married | 0-1 | 62.41% |
| Education | 0-17 | 4.89 |
| Employed | 0-1 | 14.96% |
| Economic Hardship | 1-4 | 2.20 |
| Physical Health | | |
| Self-Rated Health (1996) | 1-5 | 3.13 |
| Self-Rated Health (1999) | 1-5 | 2.95 |
| Health Behaviors | | |
| Smoking | 0-1 | 25.15% |
| Drinking | 0-1 | 19.45% |
| Exercising | 0-3 | 1.69 |
| Social Support | | |
| Perceived Support | 1-5 | 3.98 |
| Activity Engagement | | |
| Daily Activities | 0-10 | 3.58 |

Table 2.3. Ordered Logistic Regression Estimating the Effects of General Beliefs about Aging (GBAA) on Subsequent Self-Rated Health (N= 1850), 1996-1999

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Beliefs about Aging | | | | | | | |
| Aggregate Measure | 1.090**** | 1.054**** | 1.045**** | 1.041**** | 1.046**** | 1.040**** | 1.040**** |
| | (.001) | (.008) | (.045) | (.045) | (.046) | (.045) | (.046) |
| -2 Log Likelihood | 5151.865 | 4897.562 | 4856.969 | 4837.589 | 4856.696 | 4849.689 | 4834.682 |

Notes: Cells entries are cumulative odds ratios

Model 2 controls for baseline self-rated health

Model 3 controls for baseline self-rated health and sociodemographics

Model 4 controls for baseline self-rated health, sociodemographics and health behaviors

Model 5 controls for baseline self-rated health, sociodemographics and perceived support

Model 6 controls for baseline self-rated health, sociodemographics and activity engagement

Model 7 controls for baseline self-rated health, sociodemographics, health behaviors, perceived support and activity engagement

****p< .0001 ***p< .001 **p< .01 *p< .05 †p< .1

Table 2.4. Ordered Logistic Regression Estimating the Effects of Positive Beliefs about Aging (PBAA) on Subsequent Self-Rated Health, 1996-1999

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|----------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|------------------------------|
| Beliefs about Aging | | | | | | | |
| Positive | 1.537**** (.065) | 1.268*** (.066) | 1.171* (.069) | 1.150* (.069) | 1.164* (.072) | 1.113 (.071) | 1.107 (.074) |
| Health Behaviors | | | | | | | |
| Smoking | | | | 1.029 (.114) | | | 1.032 (.114) |
| Drinking | | | | 1.295* (.117) | | | 1.279* (.118) |
| Exercising | | | | 1.143**** (.033) | | | 1.130*** (.034) |
| Social Support | | | | | | | |
| Perceived Support | | | | | 1.018 (.056) | | 1.002 (.056) |
| Activity Engagement | | | | | | | |
| Daily Activities | | | | | | 1.101** (.033) | 1.075 [†] (.034) |
| Baseline Health | | 2.126**** (.044) | 1.934**** (.047) | 1.880**** (.047) | 1.930**** (.047) | 1.908**** (.065) | 1.865**** (.047) |
| Sociodemographics | | | | | | | |
| Urban | | | 1.249* (.093) | 1.212* (.093) | 1.252* (.093) | 1.224* (.093) | 1.196 [†] (.094) |
| Female | | | .703*** (.102) | .793* (.114) | .701*** (.102) | .707** (.102) | .792* (.115) |
| Age | | | .971** (.010) | .973** (.010) | .971** (.010) | .972** (.010) | .974** (.010) |
| Married | | | .951 (.097) | .974 (.097) | .950 (.097) | .954 (.097) | .973 (.097) |
| Education | | | 1.014 (.010) | 1.010 (.011) | 1.014 (.010) | 1.006 (.010) | 1.004 (.011) |
| Employed | | | 1.024 (.036) | 1.057 (.126) | 1.025 (.126) | 1.054 (.126) | 1.077 (.127) |
| Economic Hardship | | | .788*** (.071) | .802** (.071) | .791** (.072) | .804** (.071) | .813** (.073) |
| -2 Log Likelihood | 5246.188 | 4930.702 | 4876.567 | 4854.227 | 4876.469 | 4867.994 | 4849.486 |

Notes: Cells entries are cumulative odds ratios

****p< .0001 ***p< .001 **p< .01 *p< .05 [†]p< .1

Table 2.5. Ordered Logistic Regression Estimating the Effects of Negative Beliefs about Aging (NBAA) on Subsequent Self-Rated Health, 1996-1999

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|----------------------------|--------------------|---------------------|---------------------|------------------------------|---------------------|-----------------------------|-----------------------------|
| Beliefs about Aging | | | | | | | |
| Negative | .599**** (.053) | .762**** (.055) | .816*** (.060) | .830** (.060) | .819*** (.060) | .816*** (.060) | .827** (.060) |
| Health Behaviors | | | | | | | |
| Smoking | | | | 1.040 (.114) | | | 1.044 (.114) |
| Drinking | | | | 1.311* (.117) | | | 1.289* (.118) |
| Exercising | | | | 1.137**** (.033) | | | 1.120*** (.033) |
| Social Support | | | | | | | |
| Perceived Support | | | | | 1.029 (.054) | | 1.002 (.055) |
| Activity Engagement | | | | | | | |
| Daily Activities | | | | | | 1.114*** (.032) | 1.089** (.033) |
| Baseline Health | | 2.057**** (.045) | 1.906**** (.047) | 1.854**** (.047) | 1.900**** (.047) | 1.871**** (.047) | 1.831**** (.048) |
| Sociodemographics | | | | | | | |
| Urban | | | 1.207* (.093) | 1.175 [†] (.093) | 1.212* (.093) | 1.186 (.093) | 1.161 (.094) |
| Female | | | .692*** (.102) | .786* (.115) | .689*** (.102) | .695*** (.102) | 0.783* (.115) |
| Age | | | .970** (.010) | .973** (.010) | .970** (.010) | .973** (.010) | 0.975** (.010) |
| Married | | | .925 (.096) | 1.000 (.096) | .977 (.096) | .972 (.096) | 0.990 (.097) |
| Education | | | 1.015 (.010) | 1.012 (.010) | 1.015 (.010) | 1.005 (.011) | 1.004 (.011) |
| Employed | | | .996 (.126) | 1.029 (.126) | .998 (.126) | 1.031 (.127) | 1.053 (.127) |
| Economic Hardship | | | .847* (.075) | .857* (.075) | .853* (.076) | .872 [†] (.075) | .876 [†] (.077) |
| -2 Log Likelihood | 5193.756 | 4918.972 | 4870.079 | 4848.496 | 4869.803 | 4858.519 | 4841.503 |

Notes: Cells entries are cumulative odds ratios

****p< .0001 ***p< .001 **p< .01 *p< .05 [†]p< .1

Table 2.6. Ordered Logistic Regression Estimating the Effects of Five Dimensions of Aging Beliefs on Subsequent Self-Rated Health (N= 1850), 1996-1999

| | Model 1 | Model 2 |
|-------------------------|-----------|-------------------|
| Positive Beliefs | | |
| Family | 1.129* | 1.076 |
| | (.049) | (.053) |
| Leisure | 1.125** | 1.054 |
| | (.045) | (.047) |
| Activity and Autonomy | 1.273**** | 1.099 |
| | (.061) | (.065) |
| Negative Beliefs | | |
| Boredom and Uselessness | .750**** | .839** |
| | (.053) | (.054) |
| Financial Insecurity | .848*** | .920 [†] |
| | (.045) | (.046) |

Notes: Cells entries are cumulative odds ratios
 Model 1 controls for only sociodemographic characteristics
 Model 2 controls for baseline self-rated health, sociodemographics,
 health behaviors, perceived support and activity engagement

****p< .0001 ***p< .001 **p< .01 *p< .05 [†]p< .1

Conceptual Framework

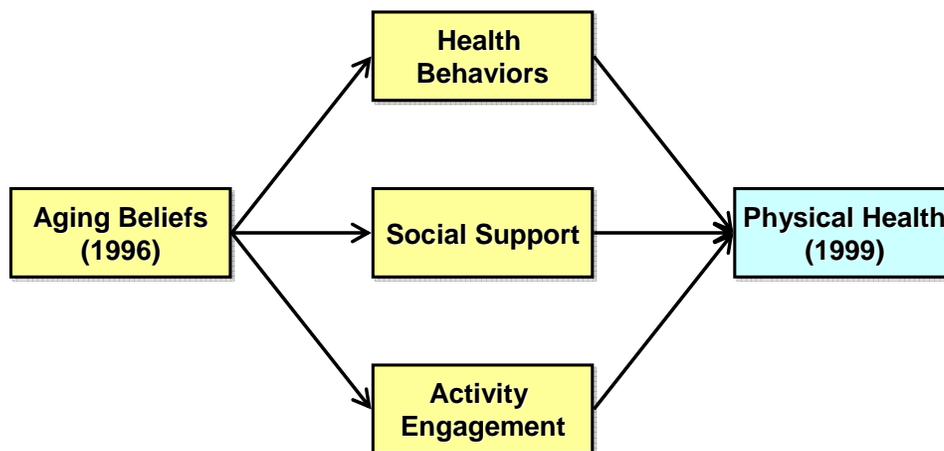


Figure 2.1. The Conceptual Framework

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Chapter 3: Beliefs about Aging and Psychological Well-Being among the Elderly in Taiwan

INTRODUCTION

Several studies document a U-shaped age pattern for depression and psychological distress (e.g., Mirowsky and Ross 1999; Schieman et al. 2001). The evidence suggests that middle age is the best time of life, and that depression increases with age. If the age pattern for depression is accurate, could it be that the elderly take a pessimistic view of the future, and that this partly accounts for their increasing emotional problems in late old age? Alternatively, does a positive outlook on aging help to promote the emotional well-being of the elderly over time? If so, what might account for the salutary effect on emotional health of holding positive beliefs about aging?

Studies of stress have long recognized that stressful experiences could be traced back to surrounding social structures. In addition, accumulating evidence indicates that individuals with exposure to similar stressors may have different emotional outcomes due to variations in personal resources, values and socially define belief system (e.g., Pearlin 1989). Studies show that social-psychological resources such as the extent to which individuals feel they control the outcome (e.g., Mirowsky and Ross, 2003), find a sense of purpose of their life, and engage in supportive and rewarding relationships may all influence individual's capacity to cope with stress. This study builds on previous research by suggesting that an optimistic/pessimistic view about aging may also contribute to differential emotional well-being among the elderly populations.

However, a majority of research still focuses on structural and functional aspects of aging, and tends to ignore the extent to which social stratification facilitates or impedes the development of psychosocial resources (Van Willigen 1997), such as

optimistic/pessimistic explanatory styles and other cognitive traits in shaping the emotional well-being. An investigation of the way people view (interpret) their own aging, may offer an alternative but significant viewpoint in understanding why some older adults in Taiwan adapt better and are emotionally healthier than others, above and beyond the influence of structural factors.

BACKGROUND

This study is based on large national representative samples that examined beliefs about aging among older people in Taiwan. The prime concern of this study stems from the potential impact, on the well-being of the elderly in Taiwan, of an aging population and rapid social changes, as a result of which social and economic development seems to downgrade traditional values and transform family structures dramatically.

In analyzing an individual's subjective beliefs about growing old, it is useful to understand the meaning of growing old in a given cultural context because cultural frameworks are closely related to aging experiences. Traditionally, the Chinese family has had an authoritarian hierarchy based on generation, age, and gender. Great emphasis was placed on respect for the elderly and caring for them. Filial piety required absolute obedience and complete devotion to elderly parents (Gallin 1994). Consequently, an ideal later life in Chinese culture is likely to involve quality care from one's children, a position of authority and respect in the family, and of course, good physical health. A classic study by Project A.G.E. (Aging, Generation, and Experience; Keith et al. 1994) compared the relationship between cultural frameworks and the experience of aging in seven communities in four countries: China, the United States, Ireland, and Botswana. The A.G.E project researchers found an interesting contrast between the Chinese and American elderly regarding the "meaning of dependence" in later life: for Americans, the

worst change in old age was becoming dependent on others, while for the Chinese, dependence on others was potentially one of the good things about growing old.

Nevertheless, the emerging literature suggests that the norms of filial piety and familial support of the elderly now face challenges from rapid population aging and dramatic social and demographic transformation. Although filial piety toward parents is internalized as a social norm, many of these rapid changes will likely alter the patterns of familial support for the elderly (Hermalin 2002), including caregiving, ideational transformation, and intergenerational co-residence. Meanwhile, and ironically, according to existing research, increasing life expectancy among the elderly actually increases their need for the family (e.g., Lu and Chen 2002). Dramatic socioeconomic development and rapid population aging are placing strains on traditional family support (Cornman et al. 2003), and raise an interesting and important question: how will the elderly respond to these changes?

In sum, elderly in Taiwan have experienced rapid changes in familial structure and social norms in the past few decades (Tien-Hyatt 1987). Some elderly are more adaptive, and some experience turmoil and disenchantment due to maladaptation (e.g., Lu and Chen 2002). This study sets out to document the extent to which older adults' prospects and experiences associated with aging are related to emotional well-being over time.

CONCEPTUAL FRAMEWORK

The Meaning and Origins of Beliefs about Aging

Theoretical and Methodological Constructs

What are beliefs about aging and how do they influence psychological well-being? Beliefs about aging refer to older people's general expectations and prospects

associated with future. Research on beliefs (e.g., beliefs about sex roles, marriage and aging) indicate that beliefs are important because they may serve as a perceptual lens through which life events are interpreted. They influence the extent to which life events are considered beneficial or harmful, and this in turn may have a substantial influence on stress and psychological well-being. A positive belief about aging refers to an optimistic self-perception of aging. An optimistic belief about aging promotes a sense of meaningfulness in later life by providing a motive for people to value their existence, and to make sense of their life experiences. A negative belief about aging, on the other hand, corresponds to a pessimistic self-perception of aging, implies powerlessness and a pessimistic interpretation of life events in later life.

An issue of contention in the emotion literature is whether positive beliefs and negative beliefs are bipolar extremes of the same scale or two separate factors (Pressman and Cohen 2005). Although evidence exists for both schools of thought, results from Life Orientation Test (LOT: Scheier and Carver 1985), the most widely used measure of dispositional optimism and pessimism, seems to suggest that optimism and pessimism should be evaluated independently (Ostir et al. 2004). In other words, positive beliefs could provide benefits independent of negative levels and vice versa. Moreover, separating positive and negative beliefs may be particularly meaningful when studying an older population (Plomin et al. 1992; Mroczek 1993), because older people tend to approach problems more dualistically. That is, they are more likely than their younger counterparts to possess a black-versus-white view (Robinson-Whelan et al. 1997). This study therefore conceptualizes optimistic beliefs and pessimistic beliefs about aging into two separate constructs.

Does Social Status Matter in the Formation of Aging Beliefs?

If beliefs about aging may be related to health and emotional well-being, then it is important to figure out how individuals develop and maintain their beliefs. Studies have suggested that self-perceptions of aging are partially a product of the social environment (Levy et al. 2004). Although personal goals and decisions (human agency) may also play an important role in the creation of meaning and purpose in later, it is important to note that even personal choices are confined within social stratification. In other words, personal goals may not be obvious or feasible, depending on where individuals are situated (Hendricks et al. 2006). Taken together, an individual's "beliefs about aging" are more than a psychological attribute because they are shaped by and contingent upon social capacities and constraints (Settersson 2002).

Beliefs about Aging and Mental Health

Direct Link: Is an Optimistic or Pessimistic Belief about Aging Related to Mental Health?

Most of the evidence for the relationship between optimism/pessimism and psychological well-being has come from people facing difficulty or adversity (Scheier et al. 2001). For example, researchers have examined the experiences of people facing health threats (e.g., Carver et al. 1993), people caring for seriously ill relatives (e.g., Shifren et al. 1995), and the stressful experiences of students entering college (e.g., Aspinwall et al. 1992). I now review some of the most prominent findings.

Carver et al. (1993) examined the effect of optimism on psychological adaptation to treatment for early-stage breast cancer. They found that optimism inversely predicted distress over time, above and beyond the effect of relevant medical variables, and beyond the effect of previous distress. Fontaine et al. (1997) investigated the development of depression before and after childbirth. They found that optimism was associated with

fewer depressive symptoms, both during pregnancy and for two weeks post partum. In addition, studies of students' adjustment to the first year of college generally found that higher levels of optimism when entering college predicted lower levels of psychological distress at the end of the semester (e.g., Aspinwall et al. 1992). Also, optimists were found to be less stressed, less depressed, less lonely and more socially supported over the semester than their pessimistic counterparts (e.g., Scheier et al. 1992).

This evidence indicates that optimists experience less distress than pessimists. Optimists differ from pessimists because optimists have better coping strategies that foster better outcomes, and are more proactive in their response to adversity (Scheier et al. 2002). More specifically, research shows that optimists tend to use more problem-focused coping strategies than pessimists. When problem-focused coping is not an option, they employ adaptive emotion-focused coping strategies, such as acceptance or positive reframing. In contrast, pessimists tend to cope through overt denial, and by mentally and behaviorally disengaging from their goals (Scheier et al. 2002), a strategy that is likely to result in even higher levels of distress eventually. In addition, the health benefits of believing that something good will happen may not be purely psychological, but biological too. There is evidence that the positive illusions held by optimists trigger the release of a number of chemicals in the body, which may, in turn, promote healing and improve mood (Taylor 1989).

I expect the same health benefits to apply to elderly individuals who hold positive beliefs about aging, although, as yet, this has not been empirically tested. Older adults holding optimistic beliefs about aging may adjust better to all kinds of stressful situations because they engage in constructive thinking and effective coping. Moreover, positive beliefs about aging may shape emotional well-being through better self-care and a more active engagement with life, as I will illustrate in the following section.

Indirect Link: Why Beliefs about Aging May Promote or Degrade Psychological Well-Being over Time

Having established the links between beliefs about aging and mental health, in the next section, I summarize the available evidence on the mental health benefits (detriments) derived from optimistic (pessimistic) beliefs about aging, and explore three possible mediating mechanisms: health behaviors, social support, and activity involvement. As shown in the conceptual framework (Figure 3.1), in this study, I consider health behaviors, social support and activity involvement as potential mediators (partly) accounting for the relation between beliefs about aging (predictor) and depression (criterion) (Baron et al. 1986).

The reviews of each mediating factor are divided into two parts⁹. First, drawing on theories and empirical evidence linking dispositional optimism/pessimism to the potential mediator, I extend some existing hypotheses to explore why optimistic or pessimistic beliefs about aging may be related to the given mediator. Second, to validate the association between the given mediator and mental health outcomes, I also review in detail the existing studies that demonstrate the proposed relationship. These strategies provide insights into the development of new theories that relate beliefs about aging to social integration (social support and engagement in social activities) and to health behaviors. In addition, they also provide theoretical grounding for identifying the causal direction between beliefs about aging and mental health. Below, I describe each possible connection.

⁹ The only exception is health behaviors. Developed theories linking perceptions of aging to health behaviors have already existed. Therefore, I do not need to draw from theories of dispositional optimism/pessimism and health behaviors.

Beliefs about Aging, Health Behaviors, and Mental Health

Beliefs about Aging and Health Behaviors

Engagement in preventive health behaviors may be an important pathway through which beliefs about aging improve emotional well-being. Previous studies (e.g., Levy et al. 2004) have suggested that older individuals who had more positive self-perceptions of aging at baseline were significantly more likely to practice preventive health care over the next two decades. A possible explanation is that those with more positive beliefs tend to have higher expectations on successful aging, and thus may view health behaviors as more beneficial and engage in them more often (Mulkana and Hailey 2001). For example, positive beliefs about aging may be related to compliance with medical follow-up, and practice of health-enhancing behaviors (eating a balanced diet, exercising and avoid smoking and heavy drinking). Likewise, although never previously tested, it is possible that older adults holding pessimistic beliefs about aging may have less intention to engage in proactive health behaviors because they tend to have lower expectation on a successful aging, and believe that health problems are inevitable in old age. In addition, since to them the future seems unpredictable and hopeless, no reason exists for these pessimistic older adults to work hard and orient themselves to the future.

Health Behaviors and Mental Health

Several studies have established a link between health behaviors and improved emotional well-being, but these results are not consistent across various health behaviors (Wada et al. 2006). The most consistent finding was the positive association between physical exercise and psychological well-being. Ross et al. (1988) demonstrated that, among the general population, increased participation in exercise, sports and physical activity is associated with improved psychological well-being, even after controlling for

other potential confounders. Other studies focusing on older adults have also shown that regular exercise or physical activity may be associated with decreased levels of depressive symptoms (e.g., Lampinen et al. 2000) and anxiety (e.g., Paluska et al. 2000), and also with individuals experiencing greater meaning in life (e.g., Kahana et al. 2002).

The potential alleviating effect of physical exercise on negative mood is likely to ensue from increased levels of endorphins and improved norepinephrine (Ross et al. 1988), which improve mood, decrease physiological symptoms, and increase the individual's subjective health. In addition, physical exercise may lead to better emotional well-being, because those who exercise frequently tend to report higher levels of a sense of coherence, and stronger feelings of social integration (Hassmen et al. 2000).

Despite the well-documented link between physical exercise and emotional well-being, only limited evidence links alcohol or tobacco use and psychological well-being among older adults. Recent studies suggest that, although mild to moderate consumption of alcohol is protective against dementia, very heavy drinking is associated with depression and suicide (Whelan 2003). Frequency of drinking, on the other hand, is not related to emotional well-being (Graham et al. 1999). In addition, smoking has previously been shown to be associated with an increased prevalence of depression (e.g., Jorm et al. 1999), especially in early adulthood (Breslau et al. 1998). Nevertheless, few data are available for elderly populations. Cassidy et al. (2004) conducted a study of Australians, which found that elderly women who had ever smoked more than 20 cigarettes per day were nearly three times as likely to show symptoms of depression. In general, research indicates that depression and anxiety are common among smokers, but the direction of causality remains unclear.

Beliefs about Aging, Social Support, and Mental Health

Beliefs about Aging and Social Support

Social support may also link beliefs about aging to improved mental health. To the best of my knowledge, no previous study attempt to link the level of optimistic/pessimistic beliefs about aging to social support. In order to provide a theoretical grounding, in this section, I begin by outlining some of the most striking findings that demonstrate the relationship between optimism/pessimism and social support.

The available evidence suggests that optimism is associated with positive outcomes in relationships in general, largely through the promotion and maintenance of social support (Srivastava et al. 2006). For example, optimism is associated with lower social alienation (Scheier and Carver 1985) and with longer lasting friendships (Srivastava et al. 2006). In other words, optimists have greater ability to generate greater social support ((Park and Folkman 1997; Brissette et al. 2002) because an optimistic outlook seems to be attractive to potential relationship partners, and is useful in initiating social ties. In addition, optimism not only leads to better social functioning, it also influences how individuals attend to and interpret others' behaviors and intentions (Srivastava et al. 2006). That is, those with a greater level of optimism may be more likely to believe that one's partner is able and willing to provide support if needed. Given the evidence linking optimism/pessimism to social support, there are several possible explanations as to why having greater levels of optimistic beliefs about aging may also foster the development of supportive social networks.

First, older adults with positive beliefs about aging may be more open-minded, easier to get along with, and thus are more welcomed by others (Carver et al. 1994), which may reinforce their expectations about how others will treat them (Srivastava et al.

2006). Second, the elderly who feel hopeful and secure about the future have more incentives to initiate new social ties and maintain good relationships with the social networks that they have already established, and this may lead to less negative interaction (Lepore and Ituarte 1999) and a higher quality of family and social relationships.

Social Support and Mental Health

Substantial evidence indicates that the perceived availability of social support buffers the effect of stress on psychological distress, depression and anxiety (reviewed by Cohen et al. 1985; Kawachi et al. 2001). The belief that others will provide necessary aid is likely to bolster one's perceived ability to cope with demands, and thus lower the stress level (Cohen 2004). In other words, social connections benefit mental health by providing the psychological and material resources needed to cope with stress (Cohen 2004). Indeed, empirical research generally shows that individuals with an intimate partner experience emotional stress less often than do those who have no-one to whom they can turn to for support (e.g., Kessler et al. 1985; Pearlin et al. 1981; Ross et al. 2002).

Cohen et al. (1985) reported the most striking evidence of stress buffering in mental health. They demonstrated that, among student and adult samples, symptoms of depression and physical ailments under stress were attenuated for those who perceived that social support was available from their social network. There is also evidence relating to older adults and patients. For example, Krause (1989) found that older adults who are unsatisfied with the support they receive are more likely to experience psychological distress. In addition, in a longitudinal analysis of cardiac patients, Helgeson (1993) reported that the perceived availability of support predicts reduced levels of distress. Cornman et al. (2003) conducted the only available study of an Asian setting. They found that, among elderly Taiwanese, greater availability of social support is significantly associated with lower mortality, better subjective health, and lower levels

of depression. However, in the presence of controls for prior health, the coefficient is significant only for depression (Cornman et al. 2003).

The studies reviewed above highlight the importance of social support in promoting psychological well-being. What might account for these observed stress-buffering and emotional-boosting benefits? Ross et al. (2002) argue that the belief that others will provide support when needed reinforces a sense of security, whereas the lack of this belief may leave individuals feeling abandoned psychologically. In addition, Cornman et al. (2003) suggest that perceptions of social support are likely to increase feelings of self-identity, personal control, and social integration, all of which are critical factors in promoting emotional well-being. Taken together, the existing literature is fairly consistent regarding the positive association between perceived social support and psychological well-being among the general population and the elderly.

Beliefs about Aging, Activity Involvement, and Mental Health

Beliefs about Aging and Activity Involvement

Activity engagement (involvement), defined as performance of meaningful social roles for either leisure, social or productive activity (Glass et al. 2006) is likely to be another pathway through which optimistic beliefs about aging influence emotional well-being. Because this area is relatively new in the literature, I started from reviewing some of the existing evidence relating to individual differences in dispositional optimism versus pessimism about one's future (Carver and Scheier 2001).

Theoretically, individuals who feel a deep sense of pessimism about the future are likely to withdraw from meaningful daily activities and goals. In contrast, those who are confident about the future tend to take a goal-engaged approach and lead to continued engagement in life's activities or pursuit of desired incentives (Scheier et al. 1992).

Although the precise causal mechanisms are still unclear, the causal link seems to go both directions. For example, Watson (1988) found that people who socialize more often and participate in more activities tend to be more enthusiastic to the life and hopeful to the future. Rossi and Rossi (1977) also showed that positive mood (affect) generates affectionate feeling that in turn leads to increased social activities. Unfortunately, despite studies linking positive/negative affect and activity engagement (as discussed above), empirical research seldom directly addresses how optimistic/pessimistic explanatory style predicts differences in engagement in versus withdraw from activities among general population (Carver et al. 2003). Most evidence in this regard still came from patients and those who are under great adversity (refer to chapter 2).

Although the empirical evidence is scarce, based on the theoretical framework, it could still be argued that hopefulness promotes a sense of expectation that things will work out well in the future, and thus translates into greater effort (Krause et al. 2003), and vice versa. Following this line of argument, it is likely that older adults feeling hopeful to the future, and with the expectation of a fulfilling and vigorous later life, have more motivations to act on their expectations by participating in different kinds of social, leisure, or productive activities. In contrast, if an individual believes that the future is hopeless and unpredictable, these feelings are likely to lead to withdrawal from meaningful and purposeful pursuits, including decreased desire for social interactions. Noticeably, withdraw from the activities of daily lives might create further risk of adverse psychological outcomes, such as depression or distress (Carver et al. 2003), which will be discussed in the following section.

Engagement in Activities and Mental Health

There is substantial support for the assumption that the more active people are in their later years, the greater is their subjective well-being (Berkman et al. 2000;

Lampinen et al. 2006). However, it remains unclear whether social engagement itself contributes to emotional well-being, independently of other related factors, given that the lines separating social network ties, physical activity, and social engagement are blurred (Glass et al. 2006). In general, several studies have observed the link between social activity (broadly defined) and depression. For example, Bruce et al. (1994) found that being socially isolated and inactive was associated with an increased risk of first onset of a major depressive disorder. Morgan et al. (1998) found that lower levels of outdoor and leisure activities at the baseline were associated with elevated risks of depression over a four-year follow-up. Glass et al. (2006) reported the most prominent finding. They demonstrated that social engagement is associated with lower depression, even after adjustment for sociodemographic characteristics, baseline health, and fitness activities. They also found that social engagement is associated with a change in depressive symptoms among those with greater levels of depression.

More longitudinal studies are needed to uncover the association between engagement in activities and depression, but it seems likely that several reasons explain the stress-buffering effect of activity engagement (Glass et al. 2006). First, social engagement may stimulate multiple body functions (e.g., cognitive, cardiovascular, neuromuscular) and may protect against cognitive decline (e.g., Bassuk et al. 1999). Second, evidence suggests that social engagement may bolster active coping strategies and, in turn, lower the risk of mortality. Third, social activities may reinforce social support. As individuals give up social activities that bring them into contact with others, their feelings of social and emotional isolation and abandonment may be reinforced, and may eventually result in increased psychological distress (Bloom et al. 1984).

RESEARCH QUESTIONS AND HYPOTHESES

In developing my research questions and hypotheses, I organized my investigation around three guiding questions. First, do optimistic or pessimistic beliefs about aging promote or degrade older people's mental health over time? Second, do the relationships between beliefs about aging and emotional well-being differ in relation to optimistic beliefs and pessimistic beliefs? Third, do health behaviors, perceived social support, and engagement in social (leisure) activities explain the association between optimistic/pessimistic beliefs about aging and psychological well-being?

To answer these questions, I draw upon the available evidence to propose the following three hypotheses:

1. An optimistic belief about aging is positively associated with lower levels of depression over time, whereas a pessimistic belief about aging is positively associated with higher levels of depression over time.
2. The links between, and the nature of, beliefs about aging and emotional well-being differ between optimistic beliefs and pessimistic beliefs.
3. Health behaviors, perceived social support and engagement in social (leisure) activities mediate (partially) the effect of optimistic/pessimistic beliefs about aging on depression.

DATA

This study uses a national representative data drawn from 1996-1999 Survey of Health and Living Status of the Elderly in Taiwan. This is a joint project between University of Michigan and the Bureau of Health Promotion in Taiwan, a representative panel study of elderly Taiwanese age 60 and above. This is a long term survey collected from 1989 until now in a three-year interval. The sample was drawn as a multistage probability sample: 1) 56 townships (primary sampling units or PSUs) were randomly

selected, 2) Within each PSU, blocks were randomly selected, and 3) Within each block, two eligible respondents were selected. Both PSUs and blocks were selected with probabilities proportional to size of the population in the sampling unit. Initial interviews started from 1989 (response rate of 91.8%) with 4049 respondents aged 60 and over and were followed up in 1993 (response rate of 91.0%) and 1996 (response rate of 88.9%). The 1996 follow-up remained 2669 respondents, who were then reinterviewed in 1999 with a response rate of 90.1%. Because information on beliefs about aging was only available in 1996 interview, all measures used in the analysis presented below came from the 1996 survey except the outcome variable (i.e., 1999 depression). After using listwise deletion of missing values to deal with item nonresponse, complete data were available for 1824 respondents. Taken together, this paper tracks the emotional well-being of the 1824 elderly respondents in 1996 over a three year period and analyzes the association between beliefs about aging and psychological well-being. Proxies were excluded from the analysis because they were not required to answer any of the self-reported questions such as depression and beliefs about aging.

Key Independent Variable

Beliefs about Aging

The beliefs about aging scale, is a multi-item self-report measure designed to capture the elderly's cognitive tendency and general evaluation toward aging (see Table 3.1). It has two components: positive beliefs about aging and negative beliefs about aging. Positive beliefs about aging (PBAA) are measured by the degree of agreement to the following questions as regard to advantages of growing old: a) "Can be your own boss; do not have to listen to others' directions"; b) "Can live a more relaxed, leisurely life"; c) "Can spend more time with spouse"; d) "Can spend more time with children"; e)

“Can spend more time taking part in social activities”; f) “Can have more time traveling”; g) “Can have more time to pursue what you like to do.” Responses to these perceived advantages are coded “completely unimportant” (1), “not too important” (2), “somewhat important”(3) or “very important” (4), with “not applicable,” or “never thought about it” coded as missing. Responses were averaged across non-missing items with a higher score indicates greater levels of positive (optimistic) beliefs. The overall alpha reliability is .78. Negative beliefs about aging (NBAA) are measured by the degree of concern to the following four questions. a) “Too much time on hands; life is more boring”; b) “No way to do useful or constructive things.” c) “Income is insufficient” and d) “Saving devalue while cost of living rises.” Responses to these questions are “no concern” (1), “a little concern” (2), “some concern” (3) or “great concern” (4). Responses were averaged across non-missing items with a higher score indicates greater levels of negative (pessimistic) beliefs. The overall alpha reliability is .74. Noticeably, under consideration, the NBAA exclude the following two disadvantages: a) “the decline of health¹⁰” b) “will miss old colleagues¹¹.”

A composite measure of beliefs about aging was also created to assess older adults’ general tendency with regard to aging. The scale of general (aggregate) beliefs about aging (GBAA) is a continuum, ranging from pessimistic beliefs to optimistic beliefs (1-40¹²), developed by subtracting the sum of the positive beliefs score from the sum of the negative beliefs score. That is, a higher score for positive beliefs and a lower score for negative beliefs will result in a larger final score (closer to the high end of the belief spectrum), indicating greater levels of general optimism. A lower score in positive

¹⁰ In consideration of possible confounding effect of baseline physical health status, I decided to remove this item from the negative belief index.

¹¹ Holding a paid job is not a shared experience by most of the respondents in this study. Therefore, I decided to remove this item.

¹² The original range for GBAA is from -14 to 25. For presentation purpose, it was transformed to 1-40.

beliefs and a higher score in negative beliefs will result in a lower final score (closer to the lower end of the belief spectrum), suggesting lower levels of general optimism, and greater pessimism. The overall alpha reliability is .69.

In addition, to capture different dimensions of aging beliefs, I further divide the GBAA into five subscales: leisure, family, activity and autonomy, boredom and uselessness and financial insecurity. The PBAA was broken down into three domains: leisure, the score of item b; family, the average score of item c and d ($\alpha = .79$); activity and autonomy, the average score of item a, e, f and g ($\alpha = .67$). The NBAA was also divided into two domains. Boredom and useless is measured by the average score of item a and b ($\alpha = .68$): Financial insecurity is measured by the average score of item c and d ($\alpha = .89$).

Dependent Variables:

Depression (CES-D) (1996 & 1999)

There are many ways to conceptualize and measure psychological well-being or psychological distress. This study focuses on depression because this is a well-tested measure and one of the most common psychological problems experienced by most people to some degree (Pearlin et al. 1977).

The level of depression is measured by the number of symptoms respondents experienced for 1-4 or more days in the previous weeks. Those symptoms are based on the CES-D scale which has been used extensively including 7 negative items and 2 positive items: (a) "have a poor appetite," (b) "feel that doing anything was exhausting," (c) "sleep poorly," (d) "in a trouble mood," (e) "feel lonely," (f) "feel people around weren't friendly," (g) "feel anguished," (h) "have no will to do anything." (i) "have joyful feelings," and (j) "life is going well." The response categories are: "often (over 4 days)"

= 3, “sometimes (2-3 days)” = 2, “rarely (1 day)” = 1, “no” = 0. The last two positive items (i and j) are reversed coded. Responses were averaged across non-missing items, and a higher number represents a higher level of depression. The alpha reliability for depression scale is .85.

Mediators

Health Behaviors: I control for several health behaviors that can have some effects on emotional well-being including (a) “alcohol consumption,” (b) “cigarette smoking,” and (c) “exercise.” Responses for alcohol consumption and cigarette smoking were dichotomized into two sets of dummy variables with no alcohol consumption or no smoking as reference group. Frequency of exercise is measure by one question: “Do you exercise regularly?” Response categories range from “no (coded 0),” “less than twice a week(coded 1),” “three to five times a week(coded 2),” “over six times a week(coded 3).” A higher number indicates a greater frequency of exercise.

Perceived Social Support: Respondents were asked to rate the availability of three type of social support from family and friends: willingness of others to listen when the respondents need to talk, level of caring or love given to the respondent, and the reliability of others to provide sick care. Response categories were recoded into the following five categories: “very poor(coded 1),” “poor(coded 2),” “satisfactory(coded 3),” “good(coded 4),” “very good(coded 5).” A higher score indicates more perceived support. The alpha reliability for perceives support scale is .78.

Daily Activities: Daily activities is measured by whether the respondents take part in the following 10 activities during leisure time (a) “Watch TV/videos,” (b) “Listen to radio/tapes,” (c) “Read newspaper, books, magazine, novels, etc.,” (d) “Play chess or cards (including mah-jongg),” (e) “Chant sutras; Pray and burn incense; go to temple to offer incense or study sutras; pray; go to church,” (f) “Chat with relatives, friends, or

neighbors; drink tea socially,”(g) ” Raise flowers; tend garden; practice garden art or floral arrangement,” (h) ”Group activities like singing groups, dancing, t’ai chi, or karaoke,” (i) “Interests or hobbies: play instruments; paint; woodworking; collecting stamps or other things”(j) ”Attending concerts, Taiwanese and Peking opera.” Activity participation is calculated by the number of activities respondents take part in ranging from 0 to 10. That is, the more activities respondents’ are involved in, the higher the score.

Sociodemographic Variables

Sociodemographic factors are controlled in the equations to rule out the possible selection effect (individuals with higher social status or other advantaged characteristics may perceive aging more positively than others).

Age is coded in number of years.

Sex is represented by a dummy variable contrasting female (coded 1) with male (coded 0).

Urban is coded as a dummy variable contrasting respondents living in urban area (coded 1) from those living in town or rural area(reference).

Education is coded in number of years of formal schooling (0-17). Beyond year of schooling, a substantial number of respondents reported to have no formal education, yet literate. In a separate analysis (not shown), I found that these group of people are much better off¹³ than those with no formal education and illiterate. Therefore, I create another category for “no education but literate (coded 1)” in between “no education (coded 0)” and “with formal education (coded 2-17).” Because of this, for those with at

¹³ Individuals with no formal education, but literate had a greater level of positive beliefs about aging, and better health outcomes compared to their illiterate counterparts.

least one year of schooling, additional one year was added in order to have “no education but literate” coded as 1.

Marital Status is represented by a dummy variable contrasting those currently married(coded 1), with those who are separated, single, divorced or widowed (reference category).

Employment Status is measured by whether respondents were employed either full time or part time (coded 1), or not (coded 0, including those who are not employed at all, home makers, or those with informal jobs such as helping out with family farm or business).

Economic Hardship is measured by one single question: “Do you (and your spouse) have enough money or any difficulty meeting monthly living expenses or other expenditures? “ Responses were “enough money, with some left over” (1), “Just enough money, no difficulty” (2), “some difficulty” (3), “much difficulty” (4), “enormous difficulty” (5). A higher number represents greater levels of economic hardship.

ANALYTICAL STRATEGY

I model the effects of beliefs about aging on subsequent depression over a 3-year period (i.e., 1996–1999). First, I examine the relationship between older adults’ general beliefs about aging and their subsequent emotional well-being using the GBAA scale. Second, to investigate how positive beliefs (PBAA) and negative beliefs (NBAA) are related to emotional well-being over time, I divide the GBAA into positive and negative domains, respectively. Third, given that the PBAA and NBAA measures comprise several different aspects of aging (family, leisure, activity and autonomy, boredom and uselessness, and financial insecurity), I further link each dimension to subsequent emotional health outcomes. This allows me to assess whether a particular aging belief is

particularly important to emotional well-being later in life, and if so, whether the effect can be explained by lifestyle factors.

I estimate seven models for the outcomes of depression (Tables 3.3-3.5). Model 1 includes only beliefs about aging to test the net effect of positive and negative beliefs on subsequent depression. Model 2 incorporates health status at the beginning of the 3-year interval to determine whether any of the effects that are revealed in Model 1 are diminished or eliminated in the presence of baseline mental health controls. For example, respondents with emotional problems are more likely than their healthier counterparts to have a negative assessment of their own aging. Model 3 includes sociodemographic controls to test whether such characteristics may account for the association between beliefs about aging and depression. Models 4–6 adjust for health behaviors, perceived support, and engagement in activities, respectively. These three models examine the degree to which each lifestyle factor accounts for the link between beliefs about aging and mental health status. Model 7 is the full model and includes all of the variables. Table 3.6 is a summary table linking each of the five dimensions of aging beliefs to subsequent depression. Model 1 examines the gross effect of a particular aging belief on depression adjusting for only sociodemographic characteristics. Model 2 incorporates all of the variables introduced in the analysis. The purpose of Table 3.6 is to examine whether any of the sub-domain of aging beliefs influence subsequent depression through life style factors (health behaviors, social support and activity engagement) examined in this study. Taken together, because the dependent variable, depression, is a continuous variable¹⁴, I use ordinary least square (OLS) regression to examine the association between aging beliefs and depression. All of the models are shown as OLS regression coefficients.

¹⁴ Because the dependent variable, depression, is positively skewed, a square-root transformation was applied to adjust for the skewness. However, since the results with or without transformation are basically identical, for the interpretation purpose, I decide to keep the variable “depression” in its original form.

RESULTS

Table 3.1 presents the items that were used to construct the measures of aging beliefs. Descriptive statistics for all variables are presented in Table 3.2. There were 1824 respondents, ranging in age from 67 to 94 at baseline; approximately 45% were female, 62% were married at the time of the study, and the average number of years of schooling was less than 5 years.

General Beliefs about Aging and Depression (Table 3.3)

Table 3.3 presents the Ordinary Least Squares (OLS) regression model that estimates the net effect of GBAA on depression. In line with previous studies, Model 1 shows that individuals with greater levels of optimistic belief (i.e., a higher score in the belief spectrum), are significantly less likely to report mental health problems ($b = -.037$, $p < .0001$). In other words, those with greater levels of pessimistic beliefs (i.e., a lower score in the belief spectrum) are significantly more likely to suffer from depression in the follow-up period. The introduction of baseline health, sociodemographics and lifestyle factors (particularly engagement in activities) indeed reduces the magnitude of GBAA on depression (from $p < .0001$ to $p < .01$), but these factors alone do not fully explain why overall greater levels of optimism and lower pessimism (i.e., scoring high on the overall scale) are prospectively related to lower depression among the elderly in Taiwan. To have a better understanding of the precise nature of beliefs about aging and their effects on the emotional well-being, GBAA is further divided into the positive and negative domain, and each is linked to depression in the next step of the analysis.

Positive and Negative Beliefs about Aging and Depression (Tables 3.4 and 3.5)

Tables 3.4 and 3.5 present OLS regression coefficients linking PBAA and NBAA to subsequent depression over time. As expected, model 1 of Tables 3.4 and 3.5 show

that positive beliefs measured at baseline significantly predict less depression over a 3-year interval ($b = -.187, p < .0001$); whereas, negative beliefs at baseline is significantly associated with higher subsequent depression ($b = .217, p < .0001$).

Model 2 of Tables 3.4 and 3.5 take into account possible effects of health selection by incorporating the initial mental health status. The inclusion of Time 1 depression reduces the effects of positive and negative beliefs on Time 2 depression by about 70% and 59%, respectively. Although the initial mental health status exerts considerable influence on an individual's emotional well-being, the substantial link between beliefs about aging (positive and negative) and depression remains ($b = -.057, p < .01$; $b = .089, p < .0001$).

When sociodemographic factors are included as additional controls in Model 3, the effect of positive beliefs on depression is totally eradicated, suggesting that individuals with advantaged social backgrounds and personal characteristics simply tend to view aging more positively. Indeed, in a separate analysis (not shown), I found that individuals who were younger, married, well educated, and with lower levels of economic hardship were significantly more likely to report greater levels of positive beliefs about aging. On the other hand, however, the effects of negative beliefs on depression remain significant only with reduced magnitude, even in the presence of the controls of prior mental health.

With Models 4–6, I seek to explain the possible mechanisms of this association by introducing three types of potentially mediating lifestyle factors: health behaviors, perceived social support, and activity engagement, respectively. All three models control for baseline self-rated health and sociodemographic characteristics. Several interesting findings emerge when comparing the coefficients of the positive and negative beliefs in Models 4–6 to the baseline model (Model 3), respectively. First, although the effects of

positive beliefs have become non-significant with the adjustment of baseline health and sociodemographics, the introduction of perceived support and activity engagement further reduce the magnitude of positive beliefs on depression by 70% and 100%, respectively. In other words, in addition to advantaged personal characteristics, greater perceived support and active involvement in activities may also explain why individuals with greater levels of positive beliefs tend to enjoy better emotional well-being in late old age. Second, health behaviors, perceived support and activity engagement all appear to have very little bearing on the relationship between NBAA and depression. Model 7 of Table 3.5 further implies other unexplained mechanisms not examined in this analysis may be responsible for the relationship between NBAA and depression ($b = .054, p < .01$). Overall, no persistent mediating patterns are found in the effects of positive and negative beliefs on depression. In the next step of the analysis, I divide PBAA and NBAA into several subscales (dimensions) to determine the aspects of aging beliefs that are particularly responsible for long-term effects on emotional well-being.

The Five Dimensions of Aging Beliefs and Depression (Table 3.6)

The positive belief index includes three dimensions of aging beliefs: “family,” “leisure,” and “activity and autonomy.” While, the negative belief index comprises two domains of aging beliefs: “boredom and uselessness” and “financial insecurity.” As shown in Model 1 of Table 3.6, each of the five dimensions of aging beliefs exerts a strong significant effect on subsequent depression, above and beyond sociodemographic controls. Among them, the beliefs of “boredom and uselessness,” and “financial insecurity” appear to have the strongest net effect on depression. Model 2 implies that, consistent with my hypothesis, the links between four dimensions of aging beliefs (“family”, “leisure”, “activity and autonomy,” and “boredom and uselessness.”) and subsequent depression are largely explained by life style factors introduced in the

analysis (health behaviors, social support and activity engagement). The only exception is “financial insecurity.” That is, financial insecurity exerts a substantial long-term influence on depression ($b = .044$, $p < .01$), even after taking into account the initial depression, sociodemographics, and lifestyle factors. Therefore, it seems reasonable to argue that the substantial unexplained effects of NBAA on depression (as indicated in Table 3.5) come predominantly from the belief of financial insecurity in later life.

DISCUSSION

The purpose of this study is to examine whether an individual’s beliefs about aging helps to shape their emotional well-being in old age. I used a multidimensional framework to explore how an individual's outlook and subjective beliefs about growing old influence their emotional well-being over time later in life.

General Beliefs and Depression (Overall Pattern)

Overall, individuals with higher GBAA scores (relatively higher optimistic and lower pessimistic beliefs) were significantly more likely to report better mental health in the follow-up period. As expected, in addition to initial mental health and sociodemographics, proactive life styles (particularly greater involvement in activities) account for part of the reason why the optimistic elderly are less likely to feel depressed over time. As mentioned earlier, most of the evidence for the relationship between optimism/pessimism and psychological well-being came from people facing difficulty or adversity. To the best of my knowledge, this is the first study to show that a general positive orientation toward aging among the community-dwelling elderly may also boost emotional well-being over time. It should be noted that the strong significant association between GBAA and depression remains even after the adjustment of all relevant factors in the analysis, indicating other unexplained mechanisms in shaping this association.

Optimistic or Not Pessimistic?

The GBAA results confirm the substantial health-promoting effects of a relatively positive perception of aging. However, because the elderly tend to view aging more dualistically and independently than other age groups, it may be that individuals with negative views of aging also report positive beliefs. In an additional empirical test, positive and negative beliefs were found to be negatively but weakly correlated, suggesting that among the Taiwanese elderly, PBAA and NBAA can be seen as an independent variables and not simply the polar opposites of the same trait. To boost emotional well-being, is it therefore more important to be optimistic or to not be pessimistic? Our evidence supports both arguments: when optimism and pessimism are explored separately, although in an opposite direction, both are significantly related to the emotional health over time. The major difference is that the strong robust effects of negative beliefs on depression cannot be explained by life style factors introduced in the analysis. In contrast, most of the observed associations between positive beliefs and subsequent emotional well-being can be explained fully by the advantages offered by the respondent's personal characteristics (younger, married, better educated, and with a lower level of economic hardship), and less emotional problems at baseline (which is likely to be a by-product of advantaged social backgrounds as well). In addition, greater social resources (i.e., perceived support from family and friends) and proactive lifestyle (i.e., higher levels of engagement in activities) were also found to be two important pathways through which positive beliefs contribute to improved emotional health.

“Financial Insecurity” and Depression

Taken together, the results support the argument that a pessimistic outlook on aging has a more robust effect on emotional well-being than an optimistic one, after multivariate adjustments. Nevertheless, since very few previous studies have examined

the link between elderly people's views on aging and their emotional well-being, it remains unclear why negative beliefs tend to exert stronger effects on emotional well-being than positive beliefs. Several possibilities exist in relation to this issue. First, because positive beliefs about aging (PBAA) and negative beliefs about aging (NBAA) each tap different domains of aging beliefs, it may be that the negative belief domains are more likely than the positive domains to influence later life quality and well-being. In other words, issues related to financial needs (i.e., "financial insecurity") and to the search for meaning and purpose in later life (i.e., "boredom and uselessness") may cause greater emotional concern to the elderly than the benefits created by their positive beliefs. Second, it is also possible that, relative to lower levels of positive beliefs, higher levels of negative beliefs reflect, in particular, an individual's lack of resources or insecurity. Individuals who are less resourceful and more insecure regarding their future may be more likely to suffer from anxiety, distress, or other forms of emotional turmoil. These hypotheses cannot be tested directly. However, by breaking down PBAA and NBAA into five separate dimensions, it is possible to assess whether any specific domain is more relevant than the others to psychological well-being over time.

As expected, four dimensions ("leisure", "family", "activity and autonomy", "boredom and uselessness") of aging beliefs influence depression through life style factors introduced in the analysis. Nevertheless, contrary to my expectation, the pessimistic belief of "financial insecurity" predicts depression above and beyond behavioral and life style factors introduced in the analysis. In other words, the unexplained, but substantial, link between negative beliefs and depression largely arises from the financial concerns of elderly Taiwanese. These results are consistent with previous studies (e.g., Lu et al. 2002), which found that finance and health are two focal concerns for the elderly in Taiwan. The analysis has already been adjusted to take

account of financial difficulty, but my results reveal that a sense of insecurity regarding later life income/saving is still likely to exert a tremendous effect on emotional well-being. Specifically, beyond the “need” factor, excessive concern or insecure regarding economic resources per se seems to take a toll on elderly people’s sense of psychological well-being.

Why Negative Beliefs about Aging Matter to Mental Health: The Mediators

As mentioned earlier, in addition to personal characteristics, life style factors introduced in the analysis such as health behaviors, engagement in activities and social support have little bearing on explaining the detrimental effect of pessimistic beliefs on emotional health, which suggests that other mechanisms not examined in this analysis may be involved.

The sense of control, the perception that one can exercise authority and influence one’s own life, and the extent that an individual perceives having personal power and direction over outcomes in life (Ross et al. 2002; Schieman 2000) may be an important pathway that was not explored in this analysis. In fact, NBAA to some extent implies a lower sense of personal control, because pessimistic beliefs lead to a tendency to be helpless in frustrating situations and a sense of powerlessness, which is likely to decrease active copings and eventually producing psychological distress (Ross et al. 2002).

On the other hand, perhaps, the health benefit (detriment) of believing something good (bad) will happen in later life is not purely psychological, but also biological. Evidence suggests that positive illusions trigger the releases of a number of chemicals in the body and may promote healing and improve mood (Taylor 1989). On the contrary, stressors related to negative beliefs may also cause a chain of physiological reactions, which may interrupt normal homeostatic processes, trigger a complex set of hormonal and physiological responses across the neuroendocrine, sympathetic nervous, immune

and cardiovascular system (Weinstein et al. 2003), and eventually lead to the wear and tear of body as well as other psychological dysregulation, including a depressed mood.

Conclusion and Limitation

Scholars have attempted to show that changing norms in the support systems of the elderly and evolving family structures are responsible for the increased incidence of emotional disorders and suicide among elderly Taiwanese. However, little attention has been given to the potential detrimental effect of viewing the process of growing old as “hopeless” and “useless” on mental health. My results suggest that negative beliefs about aging, particularly a sense of financial insecurity may have detrimental effects on emotional well-being above and beyond life style factors. In fact, an individual’s perception of aging seems to exert a stronger effect on their mental health than their perceived social support and other relevant factors. My results contribute to the aging literature by showing that seeing aging in a more positive light may preserve later life emotional well-being in the long run.

A possible limitation of this study is mortality selection. This study focused on the elderly population of Taiwan aged 67 years and older. It is well-recognized that being older increases the likelihood of having traits associated with survival (Mirowsky and Ross, 2003). In other words, those who are most pessimistic about aging and those who are most depressed may have been excluded from our sample by selection due to mortality (i.e., those who are most pessimistic may die earlier than their less pessimistic counterparts, and vice versa). Therefore, the magnitude of negative beliefs on depression may be understated. In addition, it should be noted that culture may also play an important role in influencing the formation and presentation of psychological problems. For example, mental disorders or depression are highly stigmatized in traditional Chinese culture, and the fear of being labeled is likely to lead to a low reporting of depressive

symptoms (Parker et al. 2001). This may reduce the identification of depression in the survey and influence results of this study. Thus, to have a more accurate prediction of the associations between beliefs about aging and later life emotional well-being, future study should work on conceptualizing and measuring depression in a relatively cultural-sensitive way.

Table 3.1. Measures of Beliefs about Aging

| Beliefs about Aging | Domains | Item Description |
|-----------------------------------|------------------------------------|---|
| Positive (Optimistic) | <i>Family</i> | Can spend more time with spouse |
| | | Can spend more time with children |
| | <i>Leisure</i> | Can live a more relaxed, leisurely life |
| | <i>Activity and Autonomy</i> | Can be your own boss; do not have to listen to others' directions |
| | | Can spend more time taking part in social activities |
| | | Can have more time traveling |
| | | Can have more time to pursue what you like to do |
| Negative (pessimistic) | <i>Boredom and Uselessness</i> | Too much time on hands; life is more boring |
| | | No way to do useful or constructive things. |
| | <i>Financial Insecurity</i> | Income is insufficient |
| | | Saving devaluate while cost of living rises |

Table 3.2. Descriptive Statistics (1996-1999, N= 1824)

| | Range | Mean(%) |
|-----------------------------------|-------|---------|
| Beliefs about Aging | | |
| General | 1-40 | 22.76 |
| Positive | 1-4 | 2.52 |
| Negative | 1-4 | 1.82 |
| Sociodemographic Variables | | |
| Urban | 0-1 | 35.89 |
| Female | 0-1 | 44.82 |
| Age | 67-94 | 72.66 |
| Married | 0-1 | 62.41 |
| Education | 0-17 | 4.89 |
| Employed | 0-1 | 14.96 |
| Economic Hardship | 1-4 | 2.20 |
| Physical Health | | |
| Depression (1996) | 0-3 | 0.61 |
| Depression (1999) | 0-3 | 0.63 |
| Health Behaviors | | |
| Smoking | 0-1 | 25.15 |
| Drinking | 0-1 | 19.45 |
| Exercising | 0-3 | 1.69 |
| Social Support | | |
| Perceived Support | 1-5 | 3.98 |
| Activity Engagement | | |
| Daily Activities | 0-10 | 3.57 |

Table 3.3. OLS Regression Estimating the Effects of General Beliefs about Aging (GBAA) on Subsequent Depression (N= 1824), 1996-1999

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|----------------------------|---------------------|---------------------|---------------------|--------------------|--------------------|-------------------|-------------------|
| Beliefs about Aging | | | | | | | |
| Overall Measure | -.037**** (.002) | -.017**** (.002) | -.011**** (.003) | -.011*** (.003) | -.010*** (.003) | -.009** (.003) | -.008** (.003) |
| Intercept | 1.462**** (.056) | .763**** (.065) | .049 (.243) | .059 (.247) | .138 (.247) | .183 (.245) | .246 (.252) |
| R-Square | .115 | .245 | .266 | .269 | .267 | .271 | .275 |
| Adjusted R-Square | .114 | .244 | .262 | .265 | .263 | .267 | .269 |

Notes: Cells entries are cumulative odds ratios

Model 2 controls for baseline depression

Model 3 controls for baseline depression and sociodemographics

Model 4 controls for baseline depression, sociodemographics and health behaviors

Model 5 controls for baseline depression, sociodemographics and perceived support

Model 6 controls for baseline depression, sociodemographics and activity engagement

Model 7 controls for baseline depression, sociodemographics, health behaviors, perceived support and activity engagement

****p < .0001 ***p < .001 **p < .01 *p < .05 †p < .1

Table 3.4. OLS Regression Estimating the Effects of Positive Beliefs about Aging (PBAA) on Subsequent Depression (N= 1824), 1996-1999

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|----------------------------|---------------------|--------------------|-----------------------------|-----------------------------|-----------------------------|------------------------------|-----------------------------|
| Beliefs about Aging | | | | | | | |
| Positive | -.187**** (.022) | -.057** (.021) | -.020 (.021) | -.018 (.021) | -.006 (.022) | .000 (.022) | .012 (.022) |
| Health Behaviors | | | | | | | |
| Smoking | | | | .052 (.035) | | | .052 (.034) |
| Drinking | | | | -.014 (.036) | | | -.009 (.036) |
| Exercising | | | | -.028** (.010) | | | -.022* (.010) |
| Social Support | | | | | | | |
| Perceived Support | | | | | -.047** (.018) | | -.044* (.017) |
| Activity Engagement | | | | | | | |
| Daily Activities | | | | | | -.040**** (.010) | -.036**** (.010) |
| Baseline Depression | | .477**** (.022) | .389**** (.025) | .376**** (.025) | .371**** (.025) | .377**** (.025) | .352**** (.026) |
| Sociodemographics | | | | | | | |
| Urban | | | .089** (.028) | .096*** (.028) | .087** (.028) | .100*** (.028) | .101*** (.028) |
| Female | | | .045 (.031) | .055 (.035) | .053 [†] (.031) | .043 (.031) | .065 [†] (.035) |
| Age | | | .005 [†] (.003) | .006 [†] (.003) | .006* (.003) | .005 (.003) | .005 [†] (.003) |
| Married | | | -.041 (.030) | -.044 (.030) | -.037 (.030) | -.042 (.029) | -.040 (.029) |
| Education | | | -.010** (.003) | -.008* (.003) | -.009** (.003) | -.006 [†] (.003) | -.005 (.003) |
| Employed | | | -.039 (.038) | -.046 (.038) | -.040 (.038) | -.048 (.038) | -.055 (.038) |
| Economic Hardship | | | .135**** (.022) | .131**** (.022) | .126**** (.022) | .128**** (.022) | .117**** (.022) |
| Intercept | 1.095**** (.059) | .476**** (.060) | -.229 (.240) | -.020 (.243) | -.092 (.245) | -.068 (.242) | .053 (.250) |
| R-Square | .036 | .227 | .259 | .263 | .262 | .266 | .272 |
| Adjusted R-Square | .036 | .227 | .255 | .259 | .258 | .262 | .266 |

Notes: Cell entries are OLS regression coefficients
 ****p< .0001 ***p< .001 **p< .01 *p< .05 [†]p< .1

Table 3.5. OLS Regression Estimating the Effects of Negative Beliefs about Aging (NBAA) on Subsequent Depression (N= 1824), 1996-1999

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|----------------------------|--------------------|--------------------|-----------------------------|-----------------------------|-----------------------------|---------------------|-----------------------------|
| Beliefs about Aging | | | | | | | |
| Negative | .217**** (.018) | .089**** (.017) | .060** (.018) | .056** (.018) | .056** (.018) | .061**** (.018) | .054** (.018) |
| Health Behaviors | | | | | | | |
| Smoking | | | | .049 (.035) | | | .049 (.034) |
| Drinking | | | | -.016 (.036) | | | -.009 (.036) |
| Exercising | | | | -.027** (.010) | | | -.020* (.010) |
| Social Support | | | | | | | |
| Perceived Support | | | | | -.044** (.017) | | -.038* (.017) |
| Activity Engagement | | | | | | | |
| Daily Activities | | | | | | -.041**** (.010) | -.036**** (.010) |
| Baseline Depression | | .450**** (.023) | .375**** (.025) | .364**** (.025) | .357**** (.026) | .359**** (.025) | .337**** (.026) |
| Sociodemographics | | | | | | | |
| Urban | | | .098*** (.028) | .104*** (.028) | .094*** (.028) | .107**** (.028) | .106**** (.028) |
| Female | | | .049 (.031) | .059 [†] (.035) | .057 [†] (.031) | .049 (.031) | .068* (.035) |
| Age | | | .005 [†] (.003) | .006 [†] (.003) | .006* (.003) | .004 (.003) | .005 [†] (.003) |
| Married | | | -.043 (.029) | -.046 (.029) | -.037 (.029) | -.041 (.029) | -.037 (.029) |
| Education | | | -.009** (.003) | -.008* (.003) | -.009** (.003) | -.005 (.003) | -.005 (.003) |
| Employed | | | -.031 (.038) | -.039 (.038) | -.034 (.038) | -.042 (.038) | -.050 (.038) |
| Economic Hardship | | | .113**** (.023) | .111**** (.023) | .105**** (.023) | .104**** (.023) | .097**** (.023) |
| Intercept | .231**** (.035) | .188**** (.032) | -.339 (.229) | -.297 (.234) | -.164 (.239) | -.110 (.235) | .025 (.246) |
| R-Square | .076 | .235 | .263 | .267 | .266 | .270 | .275 |
| Adjusted R-Square | .075 | .235 | .259 | .262 | .262 | .267 | .269 |

Notes: Cell entries are OLS regression coefficients
 ****p< .0001 ***p< .001 **p< .01 *p< .05 [†]p< .1

Table 3.6. OLS Regression Estimating the Effects of Five Dimensions of Aging Beliefs on Subsequent Depression (N= 1824), 1996-1999

| | Model 1 | Model 2 |
|-------------------------|--------------------|------------------|
| Positive Beliefs | | |
| Family | -.056*** (.016) | .005 (.016) |
| Leisure | -.049** (.015) | -.002 (.015) |
| Activity and Autonomy | -.059** (.020) | .007 (.020) |
| Negative Beliefs | | |
| Boredom and Uselessness | .088**** (.017) | .018 (.016) |
| Financial Insecurity | .075**** (.014) | .044** (.014) |

Notes: Cells entries are OLS regression coefficients
 Model 1 controls for only sociodemographic characteristics
 Model 2 controls for baseline self-rated health, sociodemographics,
 health behaviors, perceived support and activity engagement

****p < .0001 ***p < .001 **p < .01 *p < .05 †p < .1

Conceptual Framework

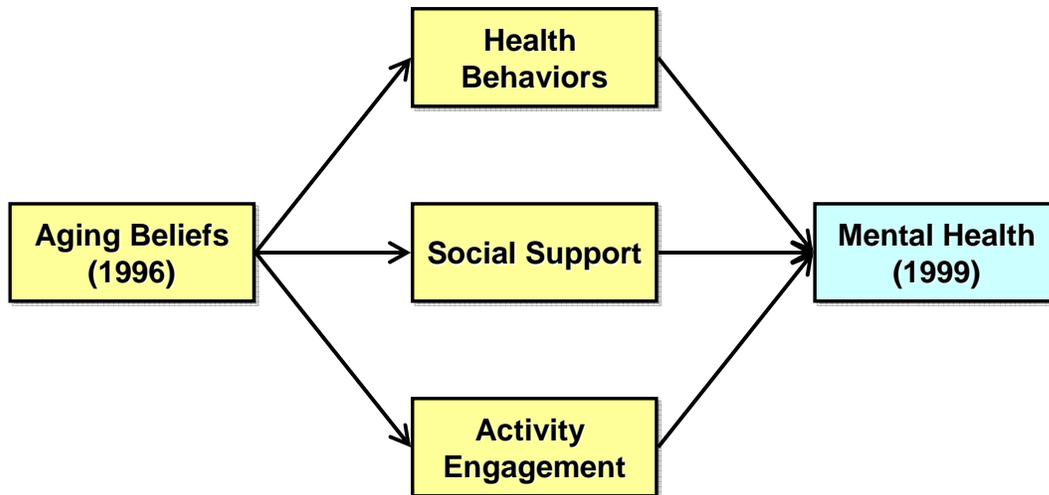


Figure 3.1. The Conceptual Framework.

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Chapter 4: Beliefs about Aging and Mortality among the Elderly in Taiwan

INTRODUCTION

Do older people with a more positive view of aging live longer than their pessimistic counterparts? If so, what might account for the salutary effect of these positive beliefs on survival?

While researchers have generally acknowledged that differences in personal beliefs may help explain the variation in the effects of life events on health and well-being among individuals, few studies have assessed the beliefs of individuals and empirically tested their importance (Simon and Marcussen 1999). Using a national representative sample of adults aged 50 years and older, I have taken a new approach to studying middle- and old-age mortality in Taiwan. First, I examined whether an individual's beliefs about aging can predict their survival over time. Second, I tested the hypothesis that optimists may have a lower risk of death than pessimists because they tend to have more supportive social relationships, engage in healthy behaviors, and are more involved in social activities.

Researchers have previously examined the role of hope (hopelessness) and optimism (pessimism) in shaping the recovery and survival outcomes of patients (e.g., Allison et al. 2003), but few studies have looked at the contribution that optimistic or pessimistic beliefs may make to the survival of community-dwelling near-elderly and elderly individuals, especially in a non-Western setting. This study contributes to the current discussion of the factors determining mortality in the elderly by proposing a new pathway to longevity: the belief that later life is hopeful, meaningful, and controllable.

BACKGROUND

Because of the rapid decline in fertility and increased longevity during the last 30 years, the proportion of older individuals in Taiwan is expected to be more than double over the next 30 years. By that time, more than one in four Taiwanese will be at least 60 years old (Zimmer et al. 2005). Research on public health planning and the development of new policies are necessary to deal with Taiwan's rapidly aging population.

Due to limited data, longevity among middle-aged and elderly populations has been studied less extensively in non-Western settings. Research on the factors that determine mortality has focused mainly on socioeconomic gradients. In an important study, Liu et al. (1998) used the 1989–1993 Survey of Health and Living Status of the elderly in Taiwan, adjusting for age, sex, education, self-rated health, and functional status, and found that education had an indirect influence on mortality through health, functional status, and health behaviors. Zimmer et al. (2005) built on this study, adding six additional years of follow-up (1989–1999) and an analysis of health behaviors and chronic diseases. Their study showed that the amount of education, self-rated health, and functional limitations are highly predictive of survival among elderly persons in Taiwan aged 60 years and older. Moreover, Zimmer et al. (2005) found survival advantages among women, mainlanders, married individuals, and those exhibiting healthier behaviors (i.e., those who had never smoked or chewed betel nut).

Previous studies have provided invaluable insight into the factors that determine mortality among the elderly in Taiwan. However, most research has focused on the process of aging and the functional changes that result, and has tended to ignore the effect of psychosocial factors, such as an optimistic or pessimistic explanatory style, on survival. The lack of attention to this aspect of aging is understandable because subtle variations in beliefs are difficult to directly measure and interpret, and they are

methodologically complex to model. Nevertheless, beliefs and subjective perceptions influence the perceived stress of an event and its effect on an individual (Tylor et al. 1999). Studying how individuals view and interpret their own aging may provide unique insights into why some elderly Taiwanese are healthier, live longer, and cope better with aging than their counterparts.

CONCEPTUAL FRAMEWORK

The Meaning and Origins of Beliefs about Aging

This study proposes that variations in people's beliefs about aging may help explain variations in the risk of mortality. Before closely examining the consequences of holding a positive or negative belief, it is helpful to provide an overview of the meaning and theoretical construct of beliefs about aging. Beliefs refer to cognitions that involve understanding of, and convictions about, some aspects of reality (Simon et al. 1999). They reflect culturally shared systems and personal experiences, group membership, and the prevailing social climate (Simon et al. 1999). Beliefs are grounded in values and may serve as a perceptual lens through which life events are interpreted as beneficial or harmful (Simon and Marcussen 1999).

A positive belief about aging corresponds to an optimistic view on aging, may provide a sense of direction and purpose in later life by fostering the expectation that things will work out well in the future (Krause and Shaw 2003). A negative belief about aging, on the other hand, implies powerlessness and pessimistic understanding of life events in later life. This study conceptualizes optimistic beliefs and pessimistic beliefs about aging into two separate constructs because studies suggest that optimism and pessimism are not simply bipolar ends but each provides benefits independent of the other (see the conceptual framework for Chapter 2 and 3).

Beliefs about Aging and Mortality

Direct Link: Is an Optimistic or Pessimistic Belief about Aging Related to Survival?

Evidence Linking General Optimism/Pessimism and Survival

Many studies have investigated the relationship between optimistic/pessimistic beliefs and mortality. Reports examining optimistic beliefs among patients generally suggest that an optimistic attitude prior to treatment enhances survival (e.g., Allison et al., 2003). In addition, optimism increases survival among community-dwelling older adults. For example, Giltay et al. (2004) found that optimism significantly reduced all-cause and cardiovascular mortality. Meanwhile, Nekanda-Trepka et al. (1983) demonstrated that greater hopelessness (pessimism) was associated with morbidity and negative expectations toward life problems. Anda et al. (1993) showed that an individual's level of hopelessness was predictive of their cardiovascular morbidity and mortality during a 12-year follow-up period; the effect was independent of depression and other factors. Everson et al. (1996) reported that hopelessness predicted mortality from all causes, as well as from specific causes including violence, cardiovascular disease, and cancer.

Empirical Studies Linking Beliefs about Aging and Survival

The survival advantages/disadvantages of general optimism/pessimism have been well studied, but few studies have focused on specific types of optimism/pessimism. I am aware of only three studies that directly link beliefs about aging and survival. All three of these studies used the "Attitudes toward Own Aging" index, a subscale of the Philadelphia Geriatric Center Morale Scale (PGCMS; Liang and Bollen, 1983), which analyzes responses to the following five items: (1) "Things keep getting worse as I get older," (2) "I have as much pep as I did last year," (3) "As you get older, you are less

useful,” (4) I am as happy now as when I was younger,” and (5), “As I get older, things are (better, worse, or the same).”

The first study, conducted by Maier and Smith (1999), used data from the Berlin Aging Study to investigate the association between 17 indicators of psychological functioning (including perceptions of aging) and mortality over a 7-year period, among respondents aged 70 and older. After multivariate control, they found that dissatisfaction with aging is an excellent predictor of mortality (RR = 1.16). The two follow-up studies by Levy et al. (2002, 2005) collected 23 years of data in a longitudinal examination of older adults’ self-perceptions of aging. The studies, which controlled for sociodemographic factors, loneliness, and functional health, showed that older individuals with more positive self-perceptions can live 7.5 years longer (RR = .090) than those with lower self-perception. In another study, Levy et al. (2005) found that individuals with a higher positive self-perception of aging at baseline were significantly less likely to die of respiratory causes over the next 23 years, even after adjustment for socioeconomic status, age, functional health, loneliness, marital status, and self-rated health. The researchers further suggested that an individual’s view of aging has a greater effect on survival than physiological measures such as systolic blood pressure and cholesterol, and health predictors including body mass index, history of smoking, and exercise.

Noticeably, the “will to live” is considered one of the most important underlying mechanisms explaining the link between aging beliefs and survival (Levy et al. 2002). Individuals with greater optimism toward aging tend to believe that the benefits of life outweigh its perceived hardships. Such a positive view on aging helps individuals cope more effectively with stressors, and thus reduces their risk of death.

The studies by Levy et al. (2002, 2005) are invaluable for understanding the link between aging beliefs and survival in later life. The present study is different for the following reasons. First, instead of conceptualizing positive and negative aging beliefs as a single bipolar construct (as in the PGCMS), I view them as two distinct dimensions. As noted earlier, this approach has proved particularly meaningful with older adults. Second, rather than having individuals compare their past and current life conditions to determine their attitudes about their own aging, as does the PGCMS index, I determine aging beliefs with measures that are more closely tied to an older adult's general assessment of aging (positive/negative beliefs) and their outlook on the future. A potentially confusing factor in the PGCMS is that old people may indicate that their young or middle adulthood was a better life stage than their later life, but this does not necessarily mean that they have a negative view of aging. Third, in addition to investigating the effect of individual beliefs about aging on survival, I examine mediating factors that impact the relationship between the two. Finally, few studies have investigated the psychosocial aspects of aging in Asia, and, to my knowledge, this study is the first in a non-Western setting to examine the effects on longevity of holding positive and/or negative beliefs about aging.

Indirect Link: Why Beliefs about Aging May Prolong or Diminish Life Expectancy Over Time?

Having reviewed some of the most dramatic direct evidence as to why beliefs about aging may be associated with survival, in the next section, I summarize the available evidence on the links between beliefs about aging and mortality, and explore three possible pathways: health behaviors, social support, and activity involvement. As shown in the conceptual framework (Figure 4.1), here, I hypothesize that beliefs about aging shape physical and emotional health through three mediators introduced in the

analysis (health behaviors, social support and activity involvement). Health status then, in turn, shapes the risk of mortality.

For the purposes of presentation, I divide the reviews of each mediating factor into two parts.¹⁵ First, drawing on theories and empirical evidence linking dispositional optimism/pessimism to the potential mediator, I extend some existing hypotheses to explore why optimistic or pessimistic beliefs about aging may be related to the given mediator. Second, to validate the association between the given mediator and mortality, I also review in detail the existing studies that demonstrate the proposed relationship. These strategies provide insights into the development of new theories that relate beliefs about aging to social integration (social support and engagement in social activities) and to health behaviors. In addition, they also provide theoretical grounding for identifying the causal direction between beliefs about aging and mortality. Below, I describe each possible connection.

Beliefs about Aging, Health Behaviors, and Mortality

Beliefs about Aging and Health Behaviors

Previous studies have demonstrated that older adults who held positive about their own aging were more likely to practice preventive health care over the next two decades (Levy et al. 2004). The preventive health behaviors included exercise, drinking in moderation, avoiding fatty foods, and the like. There are two explanations as to why optimistic beliefs may be linked to better health behaviors. First, older adults with more optimistic beliefs may deal with stressors such as illness in a more adaptive manner than pessimists (Scheier and Carver 1987). Therefore, they may be better at staying out of

¹⁵ The only exception is health behavior. Developed theories linking perceptions of aging to health behaviors already exist. Therefore, I do not need to draw from theories of dispositional optimism/pessimism and health behaviors.

distressed mood, which may, in turn, decrease the likelihood of engaging in risky behaviors, such as binge drinking, reckless driving and heavy smoking (Mulkana and Hailey 2001). Second, with a higher expectation of a successful aging, older adults with optimistic beliefs may take better self-care. While, those who felt pessimistic about their own aging may have less motivation to engage in proactive health behaviors because they tend to believe that health problems are inevitable in old age.

Health Behaviors and Survival

Health-related behaviors are closely related to mortality risk, with cigarette smoking the dominant factor affecting adult mortality (Rogers et al. 2000). Research suggests that heavy smokers or those who quit late in life are at significantly higher risk of premature death than those who never smoked, quit early, or smoked few cigarettes (e.g., Hummer et al. 1998; Rogers et al. 2000). Compared to non-smokers, smokers are more likely to die from a range of diseases, including cancer, heart disease, respiratory disease, and social pathologies (Rogers et al. 2000).

Although binge drinking is usually higher among younger people, alcohol consumption accounts for significant all-cause and cause-specific mortality among middle-aged and older adult populations. An individual's mortality risk from alcohol consumption is affected by their consumption level, past problems with drinking, the presence of other health conditions, and health-promoting behavior (Rogers et al. 2000). Previous studies have indicated that heavy drinking can increase the risk of cancer, cirrhosis of the liver, and social pathologies (e.g., Thun et al. 1997; Rogers et al. 2000). However, other studies have associated light or moderate drinking with a reduced risk of death (DeLabry et al., 1992), perhaps because some alcoholic beverages improve food digestion and raise the level of cholesterol-reducing lipids (DeLabry et al. 1992; Thun et al. 1997; Rogers et al., 2000).

In addition, exercise may improve survival. A classic study by Kaplan et al. (1987) using data from the Alameda County Study reported that physically inactive individuals have significantly higher risks of mortality than active ones. Other studies have shown similar results (e.g., Blair et al. 1989). In general, regular exercise reduces the risk of overall mortality and the risk of death from cardiovascular disease, cancer, diabetes, and respiratory diseases (e.g., Donahue et al. 1988; Paffenbarger et al. 1986). Rogers et al. (2000) argued that exercise may reduce mortality by increasing physical functioning, improving mental health, muscle strength, and flexibility, and, most importantly, by enhancing social engagement. The benefits of exercise apply to individuals of all ages, even those who begin to exercise late in life (Rogers et al. 2000).

Beliefs about Aging, Social Support, and Survival

Beliefs about Aging and Social Support

Social support may also link beliefs about aging to survival. The link between beliefs about aging and social support is relatively unexplored in the literature. Therefore, in this section, I begin by outlining existing evidence linking optimism/pessimism to social support.

Why might optimists report greater perceived support than pessimists? Studies suggest that optimism influences the way individuals attend to and interpret others' behaviors (Srivastava 2006). In other words, even under relationship conflict, optimists tend to attribute specific instances of unsupportive events to temporary and situationally limited states (Srivastava 2006). This "positive biases" in evaluating and remembering supportive behaviors may prevent cycles of negative reciprocity and promote supportive relationships. In addition, studies indicate that optimists have greater ability to generate supportive social networks (Brissette et al. 2002), and report longer lasting friendships

(Geers et al. 1998) because others are drawn to form attachments with pleasant individuals (Pressman and Cohen 2005).

Given the evidence linking optimism/pessimism to social support, there are good reasons to expect that having greater levels of optimistic beliefs about aging may also foster the development of supportive social networks. First, older adults with optimistic beliefs about aging tend to be more open-minded and cope more effectively with adversity and interpersonal conflicts arise in life (Krause et al. 2002) than their pessimistic counterparts. Therefore, they may be more independent and are less likely to demand excessive support from family and friends. Members of their social networks may thus feel less pressure and become more willing to provide support. Furthermore, with optimists' general tendency to see constructive things rather than negative affects, they may prevent negative interactions and elicit more social support (Srivastava 2006). Second, individuals who anticipate a secure and fulfilling later life may have more motivation to initiate new social ties and maintain good relationships with the social networks that they have already established, and this may lead to higher quality social ties and greater perceived support.

Social Support and Survival

Many community studies have found an association between perceived social support and decreased risk of mortality and morbidity (e.g., Berkman et al. 1979; House et al. 1988; Kaplan et al. 1988). This beneficial effect has been found for all-cause mortality, and for several other cause-specific deaths, including cancer and coronary heart disease (Lyyra et al. 2006). Perceived social support may benefit older people in two ways. First, the anticipation of support may be an effective resource during stressful times (Krause, 1997). The belief that others will be supportive reinforces an individual's sense of security and bolsters their perceived ability to cope with demands (Cohen et al.

2000). Being able to handle their own problems may, in turn, enhance an individual's sense of control, which is associated with a lower mortality risk (Krause et al., 1997). Striking evidence in this regard was reported by Rosengren et al. (1993), who examined the stress-buffering effect of social support among healthy Swedish men aged 50 years and older. Individuals who had experienced a greater number of stressful life events prior to baseline assessment had a significantly higher mortality risk over a 7-year follow-up period. However, this effect was mitigated in individuals with higher levels of perceived emotional support. Among individuals experiencing stressful life events, a greater level of emotional support may exert a protective effect against the risk of mortality. Second, perceived support may improve survival by enhancing an individual's self-esteem and sense of belonging. The absence of this belief may leave individuals feeling abandoned psychologically (Ross et al. 2002), and may lead to higher mortality risks. Indeed, a number of community studies have associated social isolation with increased risk of mortality and morbidity (e.g., Berkman et al. 1979; Schoenbach et al. 1986; House et al. 1988).

Beliefs about Aging, Activity Involvement, and Survival

Beliefs about Aging and Activity Involvement

Greater involvement in social, leisure and productive activities is likely to be another pathway through which optimistic beliefs about aging shapes survival. In general, elevated positive affect (optimism, happiness, life satisfaction and the like) is associated with enhanced affiliative feelings and increased preferences for social and prosocial activities (e.g., Cunningham 1988; Watson et al. 1988; Watson et al. 1992). However, no consistent results have been reached between negative affect and activity engagement. Cunningham (1988) proposed that positive affect produces (a) an increased interest in

social and physically strenuous activities; (b) a heightened sense of energy and vigor, so that one feels more capable of performing these activities; (c) greater self-confidence so that one expects to be rewarded for engaging in these activities (Watson et al. 1992). In addition, since interactions with high positive affect (e.g., pleasant and/or optimistic) individuals are particularly enjoyable, others may be especially likely to seek out their company, thus increasing their opportunities for social and leisure activity (Berry and Hensen 1996).

Although there is limited direct evidence linking optimistic/pessimistic explanatory style to activity engagement, following this line of argument, it is possible that a positive outlook reinforces the desire to engage in activities or pursuit of desired incentives. In contrast, a negative outlook is believed to lead to withdrawal from such activities and incentives (Scheier et al. 1992). Similarly, it is likely that older adults with the expectation of a fulfilling and vigorous later life derive especially high levels of pleasure and a sense of purpose from participating in different kinds of social, leisure, or productive activities. The enjoyment they derive from activity participation may reinforce their desire for additional social activities. Meanwhile, because others tend to perceive them as engaging and interesting partners, this may, in turn, increase their opportunities for social contacts (Berry and Hensen 1996).

Engagement in Activities and Survival

Numerous studies have suggested an association between reduced risk of death and social participation with friends, with relatives outside the household, and within the community (e.g., Berkman et al. 1979; House et al. 1982; Rogers et al. 2000). In a classic study in Alameda County, Berkman et al. (1979) found that healthy adults who were more socially integrated, married, had close family and friends, and belonged to a church or other formal or informal group were more likely to be alive 9 years later than were

their more socially isolated counterparts. The strong positive association between social integration and mortality has since been replicated (Cohen et al. 2004). Moreover, social isolation was found to predict all-cause mortality, in addition to other causes of deaths including heart disease, cerebrovascular and circulatory disease, and cancer (reviewed by Berkman et al. 2000).

Recent evidence also indicates that beyond the emotional and instrumental support that it provides, social engagement and participation are related to the maintenance of cognitive function in old age and to reduced mortality risk (Glass et al. 1999; Bassuk et al. 1999). Social engagement is probably predictive of survival in the elderly because social integration gives meaning to an individual's life by obligating them to participate in activities and allowing them to feel attached to their community (Berkman et al. 2000). Social engagement may enhance health and reduce mortality by increasing an individual's sense of belonging and attachment.

RESEARCH QUESTIONS AND HYPOTHESES

In developing my research questions and hypotheses, I organized my investigation around three guiding questions. First, do optimistic or pessimistic beliefs about aging shape the risk of mortality? Second, do the relationships between beliefs about aging and mortality differ in relation to optimistic beliefs and pessimistic beliefs? Third, do health behaviors, perceived social support, and engagement in activities explain the associations between optimistic/pessimistic beliefs about aging and survival?

To answer these three questions, drawing upon available evidence, I propose the following three hypotheses:

1. An optimistic beliefs about aging is positively associated with a lower risk of mortality over time through better physical and emotional health; whereas, a

pessimistic beliefs about aging is positively associated with a higher risk of mortality over time through worse physical and emotional health.

2. The links between, and the nature of, beliefs about aging and mortality differ between optimistic beliefs and pessimistic beliefs.
3. Health behaviors, perceived social support and engagement in social (leisure) activities mediate (partially) the effect of optimistic/pessimistic beliefs about aging on health, and in turn, shapes the risk of mortality.

DATA

The survey of Health and Living Status of the Elderly in Taiwan, a joint project between University of Michigan and the Bureau of Health Promotion in Taiwan, is a representative panel study of elderly Taiwanese. Initial interviews started from 1989 (response rate of 91.8%) with 4049 respondents aged 60 and over and were followed up in 1993 (response rate of 91.0%) and 1996 (response rate of 88.9% for elderly samples and 81.2% for near-elderly samples). The 1996 follow-up remained 2669 respondents, and was expanded to include a sample of 2462 near elderly persons aged 50-67. Thus, the 1996 survey contains a sample of all Taiwanese aged 50 and above, who were then reinterviewed in 1999 (response rate of 90.1% for elderly samples and 90.6% for near-elderly samples). This paper tracks the survival of the 5131 elderly and near elderly respondents in 1996 over the three year period and analyzes the association between beliefs about aging and the risk of mortality. The 1996 data is used as baseline because measures of beliefs about aging are only available in the 1996 survey. In addition, because of the low number of deaths during 1996-1999 among the elderly sample, I combined near-elderly and elderly samples to increase the overall sample for decedents. Due to different sampling scheme, a weighting variable is applied.

Data were linked to a death register that provides exact month and year of death for elderly and near-elderly respondents who had completed the 1996 interview and were followed up until August 1999. By the end of three year and eight month period (44 months), 484 original respondents were deceased. The survival time ranges from 5 months to 44 months.

Proxies were used in case in which the respondent was unable to answer questions, mostly due to health reasons. Among 484 deaths occurred between May 1996 to August 1999, proxies account for 111 of total deaths. Although proxies are likely to be those among the highest risk of mortality, they were excluded from this study because proxies had non-response (not required to answer) on most of the key variables in this study including self-reported questions (e.g., self-rated health) or psychological/cognitive orientation (e.g. beliefs about aging).

My final inclusion criteria required participants to have provided complete data at baseline (1996): unadjusted analysis utilizes 4745 participants who met the above criteria. However, due to missing data for covariates among some of the respondents, the multivariate analysis was limited to 4661 respondents who had completed data for all covariates of interest (4291 confirmed alive and 370 confirmed dead over a 44-month period).

MEASURES

Dependent Variable: *Mortality*

The outcome for this study is mortality. Survival time is indicated by death registry information on month and year of death. 4661 respondents were followed prospectively from January 1996 until August 1999 to assess the number of mortality that occurred during this period. For the time scale of survival analysis, I calculated the

number of months participants survived after January 1996 until a death occurred (ranges from 5-44 month).

Key Independent Variable

Beliefs about Aging

The beliefs about aging scale, is a multi-item self-report measure designed to capture the elderly's cognitive tendency and general evaluation toward aging (see Table 4.1). It has two components: positive beliefs about aging and negative beliefs about aging. *Positive beliefs about aging (PBAA)* are measured by the degree of agreement to the following questions as regard to advantages of growing old: a) "Can be your own boss; do not have to listen to others' directions"; b) "Can live a more relaxed, leisurely life"; c) "Can spend more time with spouse"; d) "Can spend more time with children"; e) "Can spend more time taking part in social activities"; f) "Can have more time traveling"; g) "Can have more time to pursue what you like to do." Responses to these perceived advantages are coded "completely unimportant" (1), "not too important" (2), "somewhat important"(3) or "very important" (4), with "not applicable," or "never thought about it" coded as missing. Responses were averaged across non-missing items. The overall alpha reliability is .78. *Negative beliefs about aging (NBAA)* are measured by the degree of concern to the following four questions. a) "Too much time on hands; life is more boring"; b) "No way to do useful or constructive things." c) "Income is insufficient" and d) "Saving devaluate while cost of living rises." Responses to these questions are "no concern" (1), "a little concern" (2), "some concern" (3) or "great concern" (4). Responses were averaged across non-missing items with higher number indicates greater levels of concern (pessimism). The overall alpha reliability is .75. Noticeably, under consideration,

the NBAA exclude the following two disadvantages: a) “the decline of health¹⁶” b) “will miss old colleagues.¹⁷”

A composite measure of beliefs about aging was also created to assess older adults’ general tendency with regard to aging. The scale of *General (aggregate) beliefs about aging (GBAA)* is a continuum, ranging from pessimistic beliefs to optimistic beliefs (1-42¹⁸), developed by subtracting the sum of the positive beliefs score from the sum of the negative beliefs score. That is, a higher score for positive beliefs and a lower score for negative beliefs will result in a larger final score (closer to the high end of the belief spectrum), indicating greater levels of general optimism. A lower score in positive beliefs and a higher score in negative beliefs will result in a lower final score (closer to the lower end of the belief spectrum), suggesting lower levels of general optimism, and greater pessimism. The overall alpha reliability is .68.

In addition, to capture different dimensions of aging beliefs, I further divide the GBAA into five subscales: leisure, family, activity and autonomy, boredom and useless and financial insecurity. The PBAA was broken down into three domains: *leisure*, the score of item b; *family*, the average score of item c and d ($\alpha = .79$); *activity and autonomy*, the average score of sum of item a, e, f and g ($\alpha = .67$). The NBAA was also divided into two domains¹⁹. *Boredom and useless* is measured by the average score of item a and b ($\alpha = .68$); *Financial insecurity* is measured by the average score of item c and d ($\alpha = .89$).

¹⁶ In consideration of possible confounding effect of baseline physical health status, I decide to remove this item from the negative belief index.

¹⁷ Holding a paid job is not a shared experience by most of the respondents in this study. Therefore, I decided to remove this item.

¹⁸ The original range for GBAA is from -14 to 27. For presentation purpose, it was transformed to 1-42.

Mediators

Baseline Health Status: This study assumes a causal link between individual's health status and the risk of mortality (see figure 4.1). Baseline self-rated health and depression are adjusted to rule out the possibility that being healthier at baseline contributes to greater positive beliefs and to the lower risk of subsequent mortality. In this study, self-rated health captures respondents' own assessment of their overall level of health with one single question, "Regarding your state of health, do you feel it's:" "poor"=1, "not good"=2, "fair"=3, "good"=4 or "excellent"=5. A higher score represents better self-rated health. The level of depression is measured by the number of symptoms respondents experienced for 1-4 or more days in the previous weeks. Those symptoms are based on the CES-D scale which has been used extensively including 7 negative items and 2 positive items: (a) "have a poor appetite," (b) "feel that doing anything was exhausting," (c) "sleep poorly," (d) "in a trouble mood," (e) "feel lonely," (f) "feel people around weren't friendly," (g) "feel anguished," (h) "have no will to do anything." (i) "have joyful feelings," and (j) "life is going well." The response categories are: "often (over 4 days)" = 3, "sometimes (2-3 days)" = 2, "rarely (1 day)"= 1, "no" = 0. The last two positive items (i and j) are reversed coded. Responses were averaged across non-missing items, and a higher number represents a higher level of depression. The alpha reliability for depression scale is .85.

Health Behaviors : I control for several health behaviors that can have life-long influences on health and mortality, including (a) "alcohol consumption," (b) "cigarette smoking," and (c) "exercise." Alcohol consumption and cigarette smoking were recognized as two major health risk behaviors. In addition, regular exercise is well-recognized as an important predictor for elderly health. Responses for alcohol consumption and cigarette smoking were dichotomized into two sets of dummy variables

with no alcohol consumption²⁰ or no smoking as reference group. Frequency of exercise is measure by one question: “Do you exercise regularly?” Response categories range from “No (coded 0),” “Less than twice a week(coded 1),” “Three to five times a week(coded 2),” “Over six times a week(coded 3).” A higher number indicates a greater frequency of exercise.

Perceived Social Support: The measure of perceived support was included because previous research has shown that perceived support has a great impact on health and mortality (Cornman et al. 2003). Respondents were asked to rate the availability of three type of social support from family and friends: willingness of others to listen when the respondents need to talk, level of caring or love given to the respondent, and the reliability of others to provide sick care ($\alpha = .79$). Response categories were recoded into the following five categories: “very poor(coded 1),” “poor(coded 2),” “satisfactory(coded 3),” “good(coded 4),” “very good(coded 5).” A higher score indicates greater perceived support.

Daily Activities: The construct of activity participation concerns the elderly’s level of participation in all kinds of social, leisure and productive activities. Involvement in social activities is typically associated with health and survival among the elderly. It is measured by whether the respondents take part in the following 12 activities during leisure time (a) “Watch TV/videos,”(b) “Listen to radio/tapes,” (c) ”Read newspaper, books, magazine, novels, etc.,” (d) ”Play chess or cards (including mah-jongg),” (e) “Chant sutras; Pray and burn incense; go to temple to offer incense or study sutras; pray;

²⁰ Research generally suggests that the effects of alcohol consumption on health and mortality depend on the amount of consumption and past problems with drinking (Rogers et al. 2000). However, because of the following two reasons, I decided to keep “current drinkers” as the indicator of drinking. First, most of the current drinkers (approximately 19%) drink rather modestly, and thus it is hard to further breaking down into different amount (frequency) of consumption. Second, in an additional analysis (not shown), although past drinkers (currently not drinking) reported greater physical problems than current drinkers, drinking history is not associated with mortality over time.

go to church,” (f) ”Chat with relatives, friends, or neighbors; drink tea socially,”(g) ”Raise flowers; tend garden; practice garden art or floral arrangement,” (h) ”Group activities like singing groups, dancing, t’ai chi, or karaoke,” (i) “Interests or hobbies: play instruments; paint; woodworking; collecting stamps or other things,” (j) ”Attending concerts, Taiwanese and Peking opera.” Activity participation is calculated by the number of activities respondents take part in ranging from 0 to 10. That is, the more activities respondents’ are involved in, the higher the score.

Sociodemographic Variables

Sociodemographic factors are controlled in the equations to rule out the possible selection effect (individuals with higher social status or other advantaged characteristics may have lower risks of mortality).

Age is coded in number of years.

Sex is represented by a dummy variable contrasting female (coded 1) with male (coded 0).

Urban is coded as a dummy variable contrasting respondents living in urban area (coded 1) from those living in town or rural area (reference).

Education is coded in number of years of formal schooling (0-17). Beyond year of schooling, a substantial number of respondents reported to have no formal education, yet literate. In a separate analysis (not shown), I found that these group of people are much better off²¹ than those with no formal education and illiterate. Therefore, I create another category for “no education but literate (coded 1)” in between “no education (coded 0)” and “with formal education (coded 2-17).” Because of this, for those with at

²¹ Individuals with no formal education, but literate have higher level of positive beliefs about aging, and better health outcomes compared to their illiterate counterparts.

least one year of schooling, additional one year was added in order to have “no education but literate” coded as 1.

Marital Status is represented by a dummy variable contrasting those currently married(coded 1), with those who are separated, single, divorced or widowed (reference category).

Employment Status is measured by whether respondents were employed either full time or part time (coded 1), or not (coded 0, including those who are not employed at all, home makers, or those with informal jobs such as helping out with family farm or business).

Economic Hardship is measured by one single question: “Do you (and your spouse) have enough money or any difficulty meeting monthly living expenses or other expenditures? “ Responses were “enough money, with some left over” (1), “Just enough money, no difficulty” (2), “some difficulty” (3), “much difficulty” (4), “enormous difficulty” (5). A higher number represents greater levels of economic hardship.

ANALYTICAL STRATEGY

This study tracks the survival of 4661 respondents over a 44-month period (between 1 January 1996 and 31 August 1999) and analyzes the link between beliefs about aging and mortality using the Cox proportional hazard model (Cox 1972). I use the multivariate Cox proportional hazard model to test the hypothesis that greater positive beliefs about aging at baseline predict subsequent lower risks of mortality, while negative beliefs at baseline predict an increased risk of mortality. First, I examine the relationship between older adults’ general beliefs about aging (GBAA) and the risk of mortality using the GBAA scale. Second, to investigate how positive (PBAA) and negative beliefs about aging (NBAA) are related to mortality over time, I divide the GBAA into positive and negative domains, respectively. The PBAA and NBAA measures comprise several

different aspects of aging (family, leisure, activity and autonomy, boredom and uselessness, and financial insecurity), so I further link each dimension to mortality. This allows me to assess whether a particular aging belief is particularly important to longevity later in life, and, if so, whether the effect can be explained by lifestyle factors. Months since baseline interview are used as the time scale for the regression analysis. Survivors were censored on 1 September 1999.

Tables 4.3-4.5 examine the links between beliefs about aging (GBAA, PBAA and NBAA) and mortality. Given my interest in testing the relationship between aging beliefs and mortality, I include only positive or negative beliefs in Model 1. Model 2 introduces the self-rated health of the participants at the beginning of the study to rule out the possibility of health selectivity. Model 3 incorporates additional sociodemographic controls including age, sex, urban/rural residency, education, marital status, economic hardship, and working status. Models 4–6 adjust for health behaviors, perceived support, and engagement in activities, respectively. These three models examine the degree to which each lifestyle factor accounts for the link between aging beliefs and mortality risk. Model 7 includes all of the variables listed earlier (baseline health status, sociodemographics and all three life style factors). Model 8 further incorporates the adjustment for baseline depression because, in addition to physical health, emotional health may also shape the risk of mortality. Table 4.6 presents the summary table testing the association between five dimension sof aging beliefs and the risk of mortality. Model 1 of Table 4.6 only adjusts for sociodemographic factors. Model 2 incorporates baseline health status, sociodemographic and three life style factors. As reported earlier, all analyses are weighted to adjust for the different schemes used to sample elderly and near-elderly participants. Therefore, all coefficients presented in Tables 4.3-4.6 are weighted hazard ratios.

RESULTS

Table 4.1 presents the items that were used to construct the measures of aging beliefs. Table 4.2 presents descriptive statistics for the total sample and for the deceased and survived respondents separately. A significance test is conducted to compare baseline characteristics for survivors and decedents over a 44-month period. As shown in Table 4.2, compared to survived respondents, those who died between 1996-1999 were significantly older, lower educated, less likely to work, with greater economic hardship and poorer baseline health status. Furthermore, they reported significantly lower levels of perceived support and engaged in fewer activities. In addition, one difference is noteworthy, survivors reported significantly higher levels of positive beliefs, whereas, no statistical difference was found relating to negative beliefs.

General Beliefs about Aging and Mortality (Table 4.3)

Table 4.3 presents the weighted risk ratios from a series of Cox proportional hazard models that estimate the effects of GBAA on mortality. Consistent with previous studies, Model 1 shows that individuals with a unit increase in the belief spectrum (ranges from 1-42) are significantly associated with a .071 unit decrease in the risk of mortality (RR= .929, $p < .0001$). Likewise, individuals with greater levels of pessimistic beliefs (i.e., in the lower end of the belief spectrum) are at a significantly higher risk of mortality in the follow-up period. In other words, those who are most optimistic (GBAA= 42) have only 5% of the mortality risk of those who are most pessimistic (GBAA= 1)²²: the risk of mortality decreases by approximately 95% from the low end to the high end of the belief spectrum. The introduction of baseline self-rated health and sociodemographics in Models 2 and 3 indeed substantially weakens the link between GBAA and mortality

²² The relative risk of mortality is calculated by $\exp(b \cdot 42) / \exp(b \cdot 1) = .929^{42} / .929 = .049$ (approximately 5%)

(RR= .976, P< .01), but the significant association remains until the inclusion of health behaviors and social integration (perceived support and engagement in activities). In other words, in addition to personal characteristics, proactive life style factors (particularly greater involvement in activities) also account for the survival advantages among those with higher levels of GBAA. In the next section, GBAA is further divided into the positive and negative domain, to investigate how positive beliefs (PBAA) and negative beliefs (NBAA) are related to the risk of mortality, respectively.

Positive and Negative Beliefs about Aging and Mortality (Tables 4.4 and 4.5)

Tables 4.4 and 4.5 present weighted hazards ratios for positive beliefs and negative beliefs, respectively. As shown in Model 1 of Table 4.4, positive beliefs are associated with a significantly lower risk of mortality (RR= .54, p< .0001). A similar pattern is observed across Models 1-5. The inclusion of self-rated health and sociodemographic characteristics in Models 2 and 3, respectively, explain a large portion of the relationship between positive beliefs and mortality ($\Delta x^2 = 268.951$). In other words, the survival advantages among the optimistic elderly largely come from their better physical health and advantaged social and personal characteristics. Contrary to my expectation, Models 4 and 5 (compared to Model 3) show that the introduction of health behaviors and social support explains only a small portion (or almost no bearing) of the link between positive beliefs and mortality. Nevertheless, activity engagement appears to be an important mediator: with the adjustment of greater involvement in activities (Model 6), the effects of positive beliefs on mortality reduce by roughly 28%²³, and become non-significant (RR= .858, NS). Model 7 shows that the adjustment of baseline health, sociodemographics, perceived support and daily activities have almost fully eradicated the link between positive beliefs and mortality (RR= .836, p< .1). In other words, in

²³ $[(1 - .803) - (1 - .858)] / (1 - .803) = .28$

addition to personal characteristics, proactive life style factors as well as a greater perceived support indeed explain the survival advantages among the elderly with greater levels of positive beliefs. Noticeably, with the adjustment of baseline depression in Model 8 (full model), the link between positive beliefs and mortality is fully eliminated.

In contrast to positive beliefs, negative beliefs about aging appear to have no significant association with mortality (RR= 1.09, NS) as presented in Model 1 of Table 5. This pattern remains across each model. In the next step of the analysis, I further divide PBAA and NBAA into several subscales (dimensions) to determine the aspects of aging beliefs that are most relevant to mortality.

The Five Dimensions of Aging Beliefs and Mortality (Tables 4.6)

Positive beliefs are broken into three domains (“family”, “leisure”, “activity and autonomy”); while negative beliefs are divided into two domains (“boredom and uselessness”, and “financial insecurity”). As shown in Model 1 of Table 4.6, beliefs related to “leisure,” “activity and autonomy,” and “boredom and uselessness” are significantly related to mortality, above and beyond the control of sociodemographics. Model 2 suggests that the associations between all three dimensions of aging beliefs and mortality have been fully explained by the inclusion of baseline health and life style factors. In a separate analysis (not shown), I found that only the belief of “activity and autonomy” shapes the risk of mortality through life style factors, independent of baseline health status (RR= .892, NS). In other words, better health behaviors and active involvement in all kinds of social, leisure and productive activities fully explain the mortality gap between those who anticipate greater levels of activity and autonomy involved later in life and those who do not.

DISCUSSION

This study examines whether the risks of mortality among near elderly and elderly Taiwanese increase or decrease because of positive or negative beliefs about aging over time. Individuals with higher overall scores (relatively higher optimistic and lower pessimistic beliefs) had a significantly lower risk of mortality in the follow-up period. This pattern remains even after adjustment for baseline health and sociodemographic factors. The survival advantage of these individuals extends beyond the effects of social background and initial health status, and is partially attributable to their proactive lifestyles. These results agree with studies suggesting that positive attitudes toward aging are one of the best predictors of survival (Liang et al. 1983; Levy et al. 2002).

Why Do Positive Beliefs Matter?

Separating the positive and negative domains of aging beliefs shows that the positive domain accounts for the survival advantage of individuals with relatively optimistic beliefs. Not surprisingly, beliefs about aging are related to an individual's current health status and their anticipation of a secure future based on their social background, but the link between positive beliefs and survival may go beyond health and sociodemographic factors. Lifestyle factors, particularly greater involvement in activities, have a substantial influence on this association. Furthermore, the introduction of lifestyle factors reduces, but does not eliminate, the survival advantage of positive beliefs until the adjustment for emotional health.

It is possible that positive beliefs about aging in general indicate an individual's greater desire for survival. A classic example is Frankl's study of Nazi concentration camps (1963), which revealed that the individuals most likely to survive were those who could find meaning and purpose in the face of adversity (Krause et al. 2003). People who are determined to achieve certain goals and who retain hopefulness about the future may

value their existence more, and this may enable them to cope with difficulty and stress, leading to a lower level of distress and a survival advantage. For example, individuals with more positive beliefs about aging may believe that health problems are preventable and treatable. These beliefs may, in turn, facilitate regular check-ups and adherence to medical regimens, which reduce the occurrence of severe illness and increase survival. In addition, individuals who feel hopeful to the future may be more likely to believe that they have control over life, and the environment is responsive to their efforts, choices and actions (Krause and Shaw 2003). Feelings of control may, in turn, enhance mood and immune function (Mirowsky and Ross 2003) and reduce the risk of mortality indirectly through improved health.

No Link between Social Support and Mortality?

Based on the theoretical framework, the building and maintenance of social resources is one pathway through which optimistic beliefs may reduce the risk of mortality (e.g., House et al. 1988). However, I found no such pattern in my study. Although the bivariate analysis (as shown in Table 4.2) suggests a significantly lower level of perceived support among deceased respondents compared to their surviving counterparts, multivariate analysis (not shown) reveals that perceived support is not predictive of mortality after adjusting for both positive beliefs and baseline self-rated health. There are two possible explanations. First, the effects of social support on mortality may be largely explained by baseline health condition. For example, an individual's poor health may be a barrier to their ability to participate in or maintain social relationships (Ren et al. 1999). In addition, the effects of social relationship may vary with the specific construct and the particular outcome assessed (House et al. 1988). In particular, previous studies have indicated that very low levels of social relationships (i.e., social isolation) appear to be more predictive of health and mortality (House et al.

1988); variation in the level of social support may be more consequential to psychological outcomes.

Longevity Increased by the Belief of “Activities and Autonomy”

When breaking down positive and negative beliefs into five dimensions, only the belief of “activities and autonomy” reduces the risk of mortality through life style factors, above and beyond the influence baseline health status. In other words, survival advantages among optimistic elderly largely arise from the belief in “activity and autonomy” in late old age. How does a positive belief in this domain lead to a lower risk of mortality? One possible pathway is through a “self-fulfilling prophecy” (Merton, 1957), in which expectations internalized during one’s lifetime evoke behaviors that cause the original conception to become reality (Levy et al. 2002). For example, individuals who anticipate that good things will happen in later life are likely to act on those perceptions, and therefore will be more likely to enjoy that phase of their life. Thus, an individual who expects to be autonomous and to be involved in activities in their later life will be more likely put time and effort into their retirement planning. In addition, they may actively participate in a wide range of activities to ensure that their later life is fulfilling and exciting. All of these possibilities may contribute to a survival advantage. Although an ideal later life does not necessarily involve activities and autonomy, an individual’s positive/negative beliefs or their image of later life may dictate their behavior, with proactive or passive behaviors affecting health and mortality.

No Price for Negative Beliefs?

Contrary to my expectations, I found no significant association between negative beliefs and mortality. These results should be interpreted with caution. The effects of negative beliefs on mortality may have been deflated because a substantial number of

proxy respondents were excluded from the study. Proxies were sought for individuals who were hospitalized or suffered from severe illness, hearing or mental impairment, or emotional disturbance (Zimmer et al. 2005), and the individuals requiring proxy responses may therefore have been in particularly bad health. Indeed, such individuals accounted for almost one-fourth (111 of 484) of the deaths between 1996 and 1999. In a separate study, I found that poor physical condition was strongly and significantly associated with higher levels of negative beliefs. Therefore, the physical condition of individuals requiring proxies may have led to negative beliefs, and their exclusion may have deflated the influence of these beliefs on mortality. Further development of the theory and more observations are necessary to address this issue.

Limitation

The major weakness of this study is its 44-month period for assessing the survival status of respondents. The short time span, coupled with high item-non-response rates (largely due to proxy respondents), produces a relatively small sample of deceased respondents. As previously discussed, this may have deflated the magnitude of aging beliefs on survival. Despite these weaknesses, this study enhances our understanding of the factors determining the mortality of middle-aged and elderly individuals in a non-Western setting, by suggesting that an individual's view of aging may influence his or her longevity.

Table 4.1. Measures of Beliefs about Aging

| Beliefs about Aging | Domains | Item Description |
|-----------------------------------|----------------------------------|---|
| Positive (Optimistic) | <i>Family</i> | Can spend more time with spouse |
| | | Can spend more time with children |
| | <i>Leisure</i> | Can live a more relaxed, leisurely life |
| | <i>Activity and Autonomy</i> | Can be your own boss; do not have to listen to others' directions |
| | | Can spend more time taking part in social activities |
| | | Can have more time traveling |
| | | Can have more time to pursue what you like to do |
| Negative (pessimistic) | <i>Boredom and Useless</i> | Too much time on hands; life is more boring |
| | | No way to do useful or constructive things. |
| | <i>Financial Insecurity</i> | Income is insufficient |
| | | Saving devaluate while cost of living rises |

Table 4.2. Weighted Baseline Sociodemographics and Health Characteristics of Middle Aged and Elderly Samples by Survival Status (1996-1999, N= 4661)

| Baseline Characteristics | Total(N=4661) Mean(SD) % | Survived(N=4291) Mean(SD) % | Dead(N=370) Mean(SD) % |
|----------------------------|-----------------------------|--------------------------------|---------------------------|
| Beliefs about Aging | | | |
| General 1-42 | 23.92(5.90) | 24.09(5.89) | 21.40(5.54)**** |
| Positive 1-4 | 2.70(0.65) | 2.72(0.64) | 2.45(0.68)**** |
| Negative 1-4 | 1.96(0.86) | 1.95(0.86) | 2.02(0.81) |
| Sociodemographics | | | |
| Age 50-95 | 62.87(8.37) | 62.41(8.56) | 68.72(8.38)**** |
| Women | 46.96% | 47.82% | 34.29% |
| Married | 81.82% | 82.82% | 67.03% |
| Formal Education 0-18 | 5.68(4.89) | 5.73(4.92) | 4.35(4.24)** |
| Economic Hardship 1-4 | 2.21(0.62) | 2.20(0.62) | 2.32(0.60)** |
| Employed | 37.75% | 39.32% | 14.68% |
| Health Status | | | |
| Self-Rated Health 1-5 | 3.25(1.12) | 3.29(1.12) | 2.60(0.98)**** |
| Depression 0-3 | .55(.59) | .53(.57) | .89(.65)**** |
| Health Behaviors | | | |
| Smoking | 28.05% | 27.75% | 46.96% |
| Drinking | 5.86% | 5.64% | 9.15% |
| Exercising 0-3 | 1.31(1.40) | 1.32(1.41) | 1.14(1.24)* |
| Social Support | | | |
| Perceived Support 1-5 | 4.04(0.76) | 4.05(0.76) | 3.88(0.80)*** |
| Activity Engagement | | | |
| Daily Activities 0-10 | 3.62(1.55) | 3.66(1.56) | 3.09(1.38)**** |

****p< .0001 ***p< .001 **p< .01 *p< .05 †p< .1

Table 4.3. Weighted Cox Proportional Hazard Model Estimating the Effects of General Beliefs about Aging (GBAA) on Mortality (N= 4661), 1996-1999

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 | Model 8 |
|----------------------------|--------------------|--------------------|-----------------|-----------------------------|-----------------|----------------|----------------|----------------|
| Beliefs about Aging | | | | | | | | |
| Overall Measure | .929**** (.009) | .957**** (.010) | .976* (.011) | .980 [†] (.011) | .975* (.011) | .984 (.011) | .982 (.012) | .989 (.012) |
| -2 Log Likelihood | 5009.974 | 4931.696 | 4750.904 | 4741.182 | 4750.602 | 4741.894 | 4736.302 | 4722.309 |

Notes: Cells entries are Cox proportional hazard ratios

Model 2 controls for baseline physical health

Model 3 controls for baseline physical health and sociodemographics

Model 4 controls for baseline physical health, sociodemographics and health behaviors

Model 5 controls for baseline physical health, sociodemographics and perceived support

Model 6 controls for baseline physical health, sociodemographics and activity engagement

Model 7 controls for baseline physical health, sociodemographics, health behaviors, perceived support and activity engagement

Model 8 controls for baseline physical health, sociodemographics, health behaviors, perceived support, activity engagement and depression

****p< .0001 ***p< .001 **p< .01 *p< .05 [†]p< .1

Table 4.4. Weighted Cox Proportional Hazard Model Estimating the Effects Positive Beliefs about Aging (PBAA) on Mortality (N= 4661), 1996-1999

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 | Model 8 |
|----------------------------|--------------------|--------------------|---------------------|---------------------|---------------------|---------------------|-----------------------------|------------------------------|
| Beliefs about Aging | | | | | | | | |
| Positive | .541**** (.086) | .649**** (.088) | .803* (.094) | .820* (.094) | .789* (.097) | .853 (.096) | .838 [†] (.100) | .853 (.100) |
| Health Behaviors | | | | | | | | |
| Smoking | | | | 1.047 (.140) | | | 1.061 (.140) | 1.075 (.140) |
| Drinking | | | | .845 (.208) | | | .878 (.209) | .894 (.209) |
| Exercising | | | | .876** (.045) | | | .893* (.047) | .912* (.046) |
| Social Support | | | | | | | | |
| Perceived Support | | | | | 1.049 (.076) | | 1.069 (.075) | 1.146 [†] (.077) |
| Activity Engagement | | | | | | | | |
| Daily Activities | | | | | | .882** (.037) | .902* (.046) | .914 [†] (.046) |
| Baseline Health | | | | | | | | |
| Physical Health | | .582**** (.059) | .610**** (.094) | .628**** (.063) | .608**** (.063) | .625**** (.063) | .634**** (.064) | .691**** (.067) |
| Depression | | | | | | | | 1.474**** (.103) |
| Sociodemographics | | | | | | | | |
| Urban | | | 1.001 (.126) | 1.037 (.127) | 1.006 (.126) | 1.025 (.126) | 1.056 (.127) | 1.016 (.127) |
| Female | | | .431**** (.135) | .419**** (.151) | .427 (.136) | .426**** (.135) | .416**** (.151) | .405**** (.151) |
| Age | | | 1.064**** (.008) | 1.066**** (.008) | 1.063**** (.008) | 1.062**** (.008) | 1.064**** (.008) | 1.061**** (.008) |
| Married | | | .967 (.137) | .959 (.138) | .959 (.137) | .967 (.137) | .948 (.138) | .970 (.139) |
| Education | | | .991 (.014) | .996 (.014) | .991 (.014) | 1.000 (.015) | 1.003 (.015) | 1.002 (.015) |
| Employed | | | .533*** (.181) | .493*** (.183) | .534*** (.181) | .516*** (.182) | .486**** (.183) | .491**** (.183) |
| Economic Hardship | | | .954 (.089) | .930 (.090) | .968 (.092) | .923 (.090) | .928 (.093) | .843 [†] (.096) |
| -2 Log Likelihood | 5019.148 | 4927.222 | 4750.197 | 4739.996 | 4749.792 | 4742.318 | 4734.399 | 4720.638 |

Notes: Cells entries are Cox proportional hazard ratios

****p< .0001 ***p< .001 **p< .01 *p< .05 [†]p< .1

Table 4.5. Weighted Cox Proportional Hazard Model Estimating the Effects of Negative Beliefs about Aging (NBAA) on Mortality (N= 4661), 1996-1999

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 | Model 8 |
|----------------------------|-----------------|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Beliefs about Aging | | | | | | | | |
| Negative | 1.092 (.066) | .922 (.068) | .974 (.075) | .952 (.075) | .974 (.075) | .965 (.075) | .952 (.075) | .902 (.076) |
| Health Behaviors | | | | | | | | |
| Smoking | | | | 1.039 (.140) | | | 1.055 (.140) | 1.066 (.140) |
| Drinking | | | | .844 (.208) | | | .878 (.209) | .894 (.209) |
| Exercising | | | | .867** (.045) | | | .889** (.046) | .907* (.046) |
| Social Support | | | | | | | | |
| Perceived Support | | | | | .993 (.073) | | 1.028 (.073) | 1.105 (.075) |
| Activity Engagement | | | | | | | | |
| Daily Activities | | | | | | .867** (.044) | .888** (.045) | .903* (.045) |
| Baseline Health | | | | | | | | |
| Physical Health | | .540**** (.060) | .599**** (.063) | .617**** (.064) | .600**** (.064) | .618**** (.064) | .628**** (.064) | .687**** (.068) |
| Depression | | | | | | | | 1.523**** (.104) |
| Sociodemographics | | | | | | | | |
| Urban | | | 1.015 (.126) | 1.052 (.127) | 1.014 (.126) | 1.037 (.126) | 1.066 (.127) | 1.018 (.128) |
| Female | | | .434**** (.135) | .420**** (.151) | .435**** (.135) | .428**** (.135) | .419**** (.151) | .405**** (.151) |
| Age | | | 1.066**** (.008) | 1.068**** (.008) | 1.066**** (.008) | 1.063**** (.008) | 1.065**** (.008) | 1.062**** (.008) |
| Married | | | .929 (.135) | .923 (.136) | .931 (.137) | .940 (.136) | .926 (.138) | .948 (.138) |
| Education | | | .987 (.014) | .992 (.014) | .987 (.014) | .999 (.015) | 1.001 (.015) | 1.000 (.015) |
| Employed | | | .525*** (.180) | .484**** (.183) | .525*** (.180) | .508*** (.180) | .477**** (.182) | .483**** (.183) |
| Economic Hardship | | | .995 (.098) | .976 (.098) | .992 (.100) | .955 (.098) | .955 (.100) | .882 (.102) |
| -2 Log Likelihood | 5066.610 | 4949.832 | 4755.529 | 4743.981 | 4755.519 | 4744.777 | 4737.055 | 4721.300 |

Notes: Cells entries are Cox proportional hazard ratios

****p< .0001 ***p< .001 **p< .01 *p< .05 †p< .1

Table 4.6. Weighted Cox Proportional Hazard Model Estimating the Effects of Five Dimensions of Aging Beliefs on Mortality (N= 4661), 1996-1999

| | Model 1 | Model 2 |
|-------------------------|------------------------------|-----------------------------|
| Positive Beliefs | | |
| Family | .905 (.069) | .930 (.073) |
| Leisure | .888 [†] (.065) | .967 (.067) |
| Activity and Autonomy | .779** (.087) | .892 (.090) |
| Negative Beliefs | | |
| Boredom and Uselessness | 1.127 [†] (.062) | .972 (.065) |
| Financial Insecurity | .973 (.059) | .900 [†] (.062) |

Notes: Cells entries are Cox proportional hazard ratios
 Model 1 controls for only sociodemographic characteristics
 Model 2 controls for baseline health status (physical and mental),
 sociodemographics, health behaviors, perceived support and activity
 engagement

****p< .0001 ***p< .001 **p< .01 *p< .05 [†]p< .1

Conceptual Framework

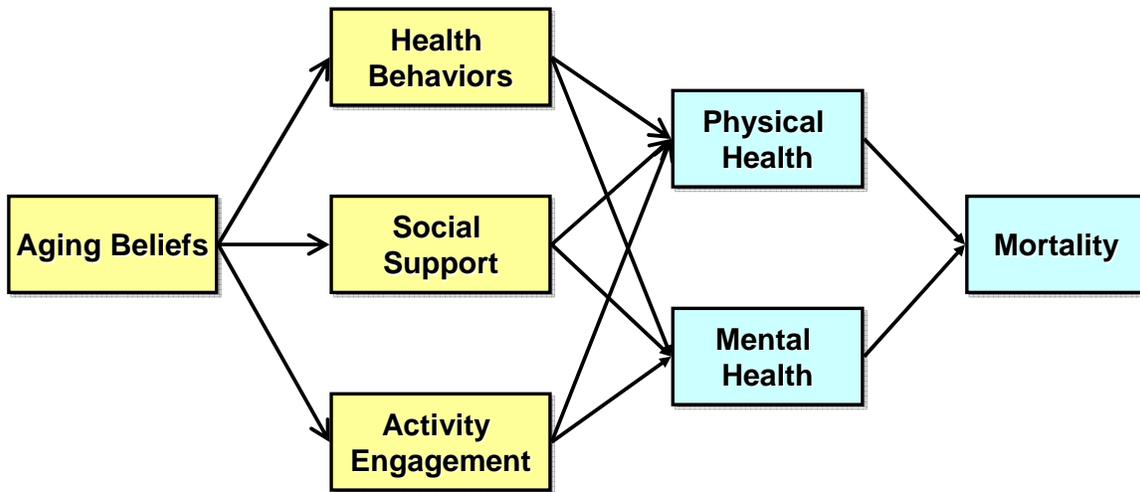


Figure 4.1. The Conceptual Framework

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Chapter 5: Discussion and Conclusion

~ A cheerful heart is good medicine.

I sought to understand whether and how experiences and prospects associated with aging shape later life health and survival. To capture different dimensions of aging beliefs, the concept of “beliefs about aging” was broken down into several constructs: general beliefs about aging (GBAA), positive beliefs about aging (PBAA), negative beliefs about aging (NBAA), and other sub-domains of aging beliefs (e.g., “leisure,” “family,” “activity and autonomy,” “boredom and uselessness,” and “financial insecurity”). Each is linked to three dimensions of health outcomes: physical health, mental health, and mortality risk.

SUMMARY OF RESULTS

Overall, I found that greater levels of positive beliefs and lower levels of negative beliefs are generally predictive of improved health (physical and mental) and survival over time, above and beyond the influence of baseline health status and sociodemographic characteristics. However, the explanatory power and magnitude of aging beliefs on health and longevity depend on the specific belief construct and the particular health outcome assessed. Here, I outline my most important findings.

First, a general positive perception on aging (scoring high on the overall scale) is associated with greater levels of physical health, mental health, and lower mortality, above and beyond baseline health, sociodemographic characteristics, and a wide range of controls (except for mortality²⁴). Second, negative domains of aging appear to have more robust effects on both physical and mental health outcomes, whereas positive domains

²⁴ The reduced risk of mortality among those with greater GBAA is fully adjusted by better health habits and greater engagement in activities.

seem to have stronger bearings on survival. Third, most of the effects of positive beliefs on health and survival can be fully explained by the mediators (better health habits, greater perceived support, and engagement in activities) introduced in the analysis. In contrast, the association between negative beliefs and health (physical and mental) is largely unexplained. Fourth, when breaking down beliefs about aging into several sub-domains, the belief of “boredom and uselessness” appears to be responsible for most of the unexplained association between negative beliefs and physical health, whereas the unexplained links between negative beliefs and depression is largely attributable to the belief of “financial insecurity.”

DISCUSSION

Do Negative Beliefs Matter More?

First, *compared to positive beliefs, do negative beliefs matter more to health in later life?* There are two possibilities. First, because positive beliefs about aging (PBAA) and negative beliefs about aging (NBAA) each tap into different domains of aging beliefs, it is possible that the negative aspects of aging influence health through factors not examined in this analysis. An alternative possibility is that domains related to negative beliefs simply concern the elderly more, and thus cause more robust effects.

Positive beliefs tap closely into the scenario of an exciting, caring, and fulfilling later life. Because perception shapes behavior, the effects of PBAA on health can largely be explained by greater levels of perceived support and involvement in activities. However, NBAA may be more relevant to an individual’s basic needs and desires in later life: a search for meaning, self-worth, and a sense of security (in particular, financial security). To some extent, a sense of meaninglessness (implied by the beliefs of “boredom and uselessness”) and insecurity may diminish an individual’s self-esteem, and

in turn, influence the way he/she cares for the self and relationships with others, as revealed by my results. However, a sense of meaninglessness and financial concerns may affect older people's health and well-being well beyond the influence of self-care and life engagement. I do not suggest that "financial security" and "the search for meaning and purpose" (domains related to NBAA) are necessarily more important than "the company of family" and "life engagement" (domains related to PBAA) to the elderly. All of these are critical components for successful aging. However, older people may be more affected by these negative beliefs because they simply touch upon an individual's deepest needs and desires for an ideal later life: to be able to find a sense of the inherent significance and value of one's existence (Mirowsky et al. 2003) and to be free from economic insecurity, which is one of the focal concerns among the elderly in Taiwan. Thus, perhaps those who report particularly high levels of "boredom and uselessness" and "financial insecurity" are likely to be the ones that are most deprived and insecure.

Negative Beliefs and Health

Second, *why are negative beliefs ("boredom and uselessness" and "financial insecurity") particularly related to physical and emotional health, above and beyond life style factors? What are other possible factors unexplored in this study?* As suggested earlier, a search for meaning and purpose may be especially critical in later stages of life (Erikson, 1997; Nilsson et al. 2003). A self-image of uselessness or worthlessness is likely to stop people from pursuing valued goals, and the internalization of these stereotypes may further trigger some biochemical effects (see Chapters 2 and 3) and cause people to become the way they think they are (e.g., memory loss, poor physical functioning; Levy et al. 2002). The belief that later life is routine and boring implies a sense of powerlessness and helplessness over one's life (e.g., the situation is

uncontrollable and nonreversible). Such a view is likely to impair people's problem-solving skills, and weaken their abilities to cope in moments of crisis (Thoits, 1995).

In addition, money may somehow imply power and autonomy in later old age. Certainly, money cannot guarantee a happier and fulfilling later life, and it is no substitute for love, support, and care from family and friends. However, financial resources may grant older people more options and flexibility in the negotiation of stressful situations (e.g., health care). In contrast, financial difficulties may constrain their autonomy in life choices and increase the potential of reliance on others. No doubt, reliance on family for care (family members are still the primary care providers of the elderly in Taiwan) in later stages of life is not necessarily a bad thing in the Taiwanese context (Setterson, 2002), depending on the family structure, values, and resources. However, over-reliance on others may pose excessive demands on network members and cause family conflict and other depressive symptoms because of a lack of personal control (Mirowsky et al. 2003). In other words, "secure economic resources" in later life may be considered as a plus, but the lack of property to support oneself in later old age may risk one's old age security (Sung, 1981), causing the elderly to become a "burden" on their descendants (Cornman, 1999). Interestingly, after adjusting for financial needs, older adults with greater concerns about their economic well-being are still significantly more likely to be depressed than others. Indeed, "no financial difficulty" does not guarantee that the elderly feel satisfied and secure about their financial status because "economic well-being" is a relatively subjective assessment. The strong association between "financial insecurity" and depression may somehow reflect recent trends of transforming family support to the elderly and the dramatic increase in longevity: enough savings are not only important for additional years of living, but essential for ensuring that adult children will treat them with respect (Cornman, 1999).

Negative Beliefs and Survival

Third, *in contrast to the results of physical and emotional health, why do negative beliefs have almost no bearing on survival?* There are several possible explanations. First, the lack of a significant association between negative beliefs and mortality may be related to the short follow-up time (44 months); it might take longer for the detrimental effects of negative beliefs to be fully reflected in the risk of mortality. For example, Levy et al. (2002) established a link between self-perceptions of aging and mortality with a 27-year follow-up period.

Second, this study excluded respondents that required proxies (proxies were sought when respondents were in particularly bad health). Therefore, relatively speaking, those who remained in the sample may not have had particularly acute physical or emotional conditions likely to cause immediate death. In other words, although some of the respondents may have held strong negative beliefs on aging, the potentially negative effects might be reflected more in a trajectory of declining health (Idler and Benyamini 1997), than in an increased risk of death. Indeed, the results indicate that those with higher levels of negative beliefs were significantly more likely to experience a decline in self-rated health (a general assessment of well being) and an increase in depression over time. It should be noted that poor self-rated health and depression may increase the risk of mortality in the long term.

In fact, the results of GBAA (the composite measure of beliefs about aging) show that individuals with more positive perceptions of aging at baseline have a significantly lower risk of mortality than those with less positive perceptions. The advantage remained after the baseline factors of health status, age, sex, socioeconomic status, and urban/rural residence were included as covariates (RR = .976). Therefore, despite the unclear link

between negative domains of aging beliefs and survival, there is evidence that holding a relatively pessimistic view on aging may still pose a higher risk of death.

Positive Beliefs and Health

Fourth, *how can positive beliefs about aging influence health and survival?* Positive beliefs about aging may shape health and survival through behaviors and physiological systems. My results suggest that perception shapes behavior, which in turn shapes tangible outcomes. Thus, individuals who anticipate good things via the aging process are likely to act on these expectations. Furthermore, positive beliefs may generate psychological resources by promoting resilience, endurance, and optimism (Pressman et al. 2005). All of these may translate into greater efforts to maintain higher-quality social ties, reduce health-risk behaviors, and engage in more exercise and social activities. These proactive behaviors may help reduce stress appraisals and improve overall health.

In addition, although beyond the scope of this study, research suggests that positive beliefs may improve health beyond social and behavioral factors. For example, positive beliefs can protect people from negative responses to stress through the release of endogenous opioids, which can diminish autonomic and endocrine responses that are often triggered by stress or by altering immune function (Pressman et al. 2005). Optimistic beliefs may also alter older people's disease susceptibility via the dampening of SNS (sympathetic nervous system) activity, and decreasing the heart rate, blood pressure, and blood concentrations of the hormones epinephrine and norepinephrine (Pressman et al., 2005).

Beliefs about Aging and the SES

Fifth, *are positive or negative views on aging more than personal choices?* Rowe and Kahn's (1998) study emphasizing personal agency argued that, "successful aging is

dependent upon individual choice and behaviors....” (p. 37). I also found that individuals’ beliefs about aging shape their well-being in later life, partly through lifestyle and behavioral factors. However, from where do these beliefs about aging come? Is an optimistic or pessimistic view on aging simply a life-style choice made by an individual?

In a separate study²⁵, I found that individual’s social status is closely related to their beliefs about aging, even after a wide range of controls. People with advantaged social backgrounds, higher education, and less economic hardship tended to have more optimistic outlooks on aging than their less fortunate counterparts. In other words, social status and access to resources can actually facilitate or hobble adaptive responses and shape individuals’ beliefs in the long run (Hendricks et al. 2006). As a matter of fact, the seemingly flexible personal choices regarding how people live and how they respond to changes associated with aging are still restricted and highly dependent on where the individuals are situated.

For example, the perceptions and expectations of growing old may come from social comparisons with networks members (relatives, friends, and neighbors) surrounding older adults. It is likely that well-educated and affluent people may have more opportunities to encounter people with exciting retirement plans, including interesting activities, travel, and leisure pursuits. Under adequate health conditions, wealthier people are likely to project their future to be as rich and colorful as those of people who are in the same social stratum. With the resources to carry out those plans, they may also feel more hopeful toward their later lives.

It should also be added that being wealthy, better educated, or having other advantaged personal characteristics do not guarantee a positive perception on growing

²⁵ The study is titled as “The origin of beliefs about aging,” which is an extension of this dissertation, looking at the links between SES and individual’s beliefs about aging.

old or more fulfilling aging experiences. The point I wish to emphasize is that elders' perceptions of their own aging are more than psychological attributes; they also reflect a full range of possibilities and constraints. Future research can build on my results by exploring the processes by which individuals develop their beliefs about aging.

CONTRIBUTIONS AND IMPLICATIONS IN THE TAIWANESE CONTEXT

As noted in Chapter 1, the Common Health Magazine in Taiwan conducted a "Health and Longevity Survey" in 1999 regarding the general attitudes of Taiwanese toward aging. One of the survey questions was, "What is the most important factor contributing to a happy and fulfilling later life?" In addition to health and economic well-being, "an optimistic and active view on aging" was reported by Taiwanese as the most important determinant in shaping successful aging. Furthermore, an optimistic perception of aging was reported to be more influential to well-being in later life than "support from family and friends," "life engagement," and "social welfare."

My findings support the belief generally held by Taiwanese people relating to the importance of viewing aging in a positive light. As a matter of fact, my research presents evidence that an individual's optimistic or pessimistic beliefs about aging have a stronger bearing on health and survival than some aspects of social integration (e.g., perceived social support) and proactive behaviors (e.g., health behaviors), above and beyond other important determinants (e.g., health, economic hardship) in shaping well-being later in life.

Although filial piety and care of the elderly are still considered central cultural norms in Chinese culture and will persist beyond sociodemographic changes (Hermalin & Yang 2004), research suggests that the practice of filial piety is on the decline and no longer commands the same degree of absolute adherence that it once did (Yeh & Bedford, 2003). In fact, despite strong beliefs that children should step in when needed, a

growing body of research documents a substantial decline in expectations for living with and receiving support from adult children (Coombs & Son 1981; Cornman, 1999). This pattern is increasingly apparent with each successive cohort and each elevated level of the social ladder (Hermalin & Yang 2004). Furthermore, cumulative evidence indicates the changing nature of the intergenerational contract: it is now based not only on obligation, but also on exchange (Hermalin & Yang 2004). For example, older parents may take on substantial responsibilities for meal preparation and grandchild care to assist their adult children.

It is still unclear whether the weakening endorsement of filial responsibility reflects the older adults' growing preferences for independence or is instead simply a response to the current trend. Nevertheless, the changing nature of family support and the increase in the dependency ratio, coupled with the dramatic improvement in old age survival, implies that a healthy and fulfilling later life nowadays may count on more than luck, children's support, or social welfare programs; the way individuals view and prepare for their own aging may also play a part. My study demonstrates that despite physically intact, generally active, and supportive relationships, the individual's subjective perception of aging is another determinant in securing a healthy later life among elderly Taiwanese.

Taken together, I found that beyond social constraints, individuals *to some extent* are still active agents in controlling the quality of their later lives. Indeed, as addressed earlier, objective or realistic views of the resources possessed by individuals (and the opportunities and constraints that apply) matter in the formation of aging beliefs and well-being in later life. However, an individual's beliefs about aging may not be fully founded on objective conditions, and in fact, positive beliefs may help individuals translate limited resources into opportunities and deal with problems that inevitably arise,

eventually leading to better health outcomes. In contrast, individuals who view aging in an unfavorable way as involving boredom, uselessness, and resource constraints may limit their pursuit for a better life. These stereotypes may, in turn, impact health and well-being, regardless of the actual amount of property or resources possessed by the individuals. Therefore, the definition of successful aging (Rowe et al. 1998) in the Taiwanese context should probably include not only “objective health conditions,” (e.g., physical and functional health), but also “subjective health” (the positive self-perception of aging).

A Chinese saying goes, “The setting sun appears sublime and glorious, but unfortunately, it will soon be buried by the coming night.” This proverb aptly describes the fear, anxiety, and avoidance with which Chinese people view later stages of life. It also reflects the fact that many Taiwanese have no preparation or planning for later years of life until they actually reach retirement age. In some extreme cases, the elderly simply rely on arrangements made by their children or spouse (Lu et al. 2002). In light of the changing nature of society, policy makers need to make special efforts to help older people to prepare for their later years physically, mentally, and financially. A case can also be made that understanding the key to later life well-being should not be passively controlled by others: with optimistic and active views on aging, old age can also be a time of enjoyment, opportunities, and comfort.

LIMITATIONS AND FUTURE RESEARCH

Despite the contributions of my study, it has several limitations. First, a major limitation is the short follow-up period (1996–1999) and the use of only two waves of data. It will be important to replicate this study as new waves become available to assess whether the beneficial effects of positive beliefs about aging observed here persist over a longer period. Also, I cannot rule out the possibility that mediators introduced in the

analysis (e.g., access to social support) are also important sources (i.e., precursors) in the formation of an individual's beliefs about aging (i.e., individuals with more perceived support are more likely to feel secure and optimistic about their own aging). Thus, with three waves of data, the causal directions of the relationships between beliefs about aging, life style factors (or social ties), and health may be better discerned.

Second, another potential limitation is mortality selection. Individuals who survive to later stages of life tend to be more robust and possess certain survival advantages (e.g., are healthier and more resilient, with fewer health-risk behaviors and more positive self-perceptions). Some of these patterns are reflected in the descriptive statistics of Chapter 4. Thus, the effects of negative beliefs on health and mortality are likely to be deflated (i.e., those who were most pessimistic and least healthy may have been excluded from our samples by early death).

Third, the measure of beliefs about aging is not all-inclusive. Some of the most important advantages (positive beliefs) or disadvantages (negative beliefs) associated with aging are not included in my data. For example, in Taiwan's social and cultural contexts, the benefits of growing old may involve "less responsibility, burden, and worry," "gaining more respect and courtesy," "enjoying the flourishing family," and "the satisfaction of watching descendents grow up." With regard to negative beliefs, as a result of a growing discrepancy between traditional norms and contemporary trends, the disadvantages of aging may involve the fears of "being neglected and disrespected by descendents," and "becoming a burden on family members." By incorporating different facets of aging beliefs based on the specific cultural context, we may be able to capture a fuller, more balanced picture of the beliefs–health connection.

Fourth, this study may not be generalizable to future elderly because the results may reflect special cohort experiences. The cohort examined here is a very special group.

They were raised according to traditional values, witnessed dramatic social transformations in Taiwan during mid-adulthood, and in later stages of life, they found themselves to be the first generation to encounter challenges against traditional belief systems. In addition, a majority of the elderly subjects had gone through the period of Japanese ruling (1895–1945), which partially explains their lower educational attainment, World War Two, and the Chinese Civil War (1949). A large number of young soldiers migrated to Taiwan during the Chinese Civil War, which may be part of the reason that the elderly sample includes slightly more males than females. It is unclear how wars and relative deprivation in earlier stages of life shaped their subjective perceptions of aging later in life. However, some of the unique cohort experiences may come into play and may not be applicable to succeeding generations. In addition, as noted earlier, due to a small number of deaths among the elderly sample (largely because of the exclusion of proxy respondents) from 1996–1999, the analysis of survival combines both elderly and the near elderly (> 50) subjects. Thus, my results cannot be transparently applied to all elderly populations in Taiwan.

DIRECTIONS FOR FUTURE STUDY

Future research can build on this study in several ways. First, this study shows that individuals' beliefs about aging may exert a substantial influence on health and survival later in life. A subsequent unanswered question is: Why do some older people perceive aging more positively than others? Beliefs about aging may come from different sources, including the individual's social background (as discussed earlier), personal experiences to date (whether they have already experienced a health decline or decreased financial capacity), general evaluation toward the past and present (Nilsson et al. 2003), physical and mental health status, resources and support available, and social

comparisons (upward or downward; George, 2006). A high priority for future research should be studies that observe patterns of beliefs about aging over the lifetime.

Second, another direction for future research involves exploring whether optimistic beliefs about aging are particularly helpful for older adults who are dealing with stressful events and conditions. A positive view on aging may buffer the detrimental effects of specific stressors (e.g., loss of a loved one, health problems, family conflict, and financial difficulty), as well as other personal difficulties confronted by an individual, on health. This is because individuals with optimistic cognitive orientation tend to cope more effectively with stressors (Scheier et al. 1986), which may yield salutary effects on both physical and psychological outcomes. Taken together, future research may gain insights on the stress-buffering effects of positive beliefs by examining the extent to which the GBAA may moderate or buffer the deleterious effects of stressful events on well-being in later life.

Third, subsequent research should also examine whether there are subgroup differences in the links between beliefs about aging and health (or survival) in later life. For example, are individuals with lower SES more affected by negative beliefs about aging? Do beliefs about aging exert different effects on health among young-elderly and older-elderly, males and females, and married and non-married (including divorced or widowed) people?

Fourth, two possible limitations of my study were its reliance on survey data and the fact that most theories and hypotheses came from Western settings. With the recognition that the meanings of aging and well-being are defined in terms of cultural values, an important avenue for future research is the inclusion of non-questionnaire data (e.g., field research or in-depth interviews) to test survey results and provide further culture-specific insights into the topic.

Finally, as discussed earlier, positive or negative beliefs about aging may shape health and well-being in later life through biochemical factors. However, only a small body of research has given attention to the effects of social factors on the expression of biological and physiological parameters (Weinstein et al. 2003). New directions for future research should include studies that observe how optimistic or pessimistic beliefs influence health through other unexplored physiological pathways (e.g., the concept of allostatic load).

In summary, the quest to understand the foundations of well-being in later life has been a central theme of research on aging. As a first step in the exploration of the link between individual's self-perception on aging and later life health and survival in a non-Western setting, my study highlights the need for empirical and conceptual development in the study of aging and subjective well-being.

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