

ABSTRACT

Cross-National Analysis of the Association between Subjective Social Status and Health

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Socioeconomic discrepancies and their associations with health have been a persistent issue in the sociology of health and illness across the globe. Throughout the extensive research effort, subjective social status (SSS) has emerged as a relevant tool for social science and health researchers to investigate socioeconomic disparities in health. Despite the increasing evidences of a significant relationship between SSS and health, most of the findings have been drawn from Western countries. We have little knowledge about how SSS could be associated with health and illness in other countries like Asia and possible explanations of a different social and cultural context. Drawing on cross-national multiple data sets at the individual levels, the three national analyses in this project demonstrate the influence of SSS on a wide range of physical and mental health outcomes of mid and later life adult populations in South Korea, the United States, and a metropolitan area in Japan. The findings for each study are discussed. This study concludes with implications for policy and suggestions for future research.

Cross-national Analysis of the Association between Subjective Social Status and Health

by

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A Dissertation

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TABLE OF CONTENTS

List of Tables	vii
Acknowledgments.....	viii
Dedication	xx
Chapter One: Introduction	01
Chapter Two:	
Association between Subjective Social Status and Health of Adults in South Korea.....	09
Introduction.....	09
Data	14
Methodology.....	18
Results.....	19
Conclusion	27
Chapter Three:	
The Association between Subjective Social Status and Health of Adults in the United States.....	31
Introduction.....	31
Data	34
Methodology.....	39
Results.....	44
Conclusion.....	47
Chapter Four:	
A Comparison between Adult Population of Metropolitan Areas in Seoul, South Korea and Tokyo, Japan on Subjective Social Status and Health linkage.....	51
Introduction.....	51
Data	55
Methodology.....	61
Results.....	62
Conclusion.....	75
Chapter Five: Conclusion	80
Appendices	
Chapter Two Additional Tables.....	92
Chapter Three Additional Tables.....	94

Chapter Four Additional Tables.....	96
Bibliography	98

LIST OF TABLES

Table 2.1 The sociodemographic characteristics of the participants, Korean Longitudinal Study of Ageing at baseline (2008).....	17
Table 2.2 Bivariate Correlation for Key Variables, Korean Longitudinal Study of Ageing.....	26
Table 2.3 Ordinary Least Square (OLS) Coefficients from the Regression of Overall Life Satisfaction, Current Health Quality, and Depressive Symptoms (CES-D10) in Subjective Social Status (SSS), Health behaviors, and Sociodemographic Control Variables	23
Table 2.4 Odds Ratios from Ordered Logistic Regression of Self-rated Health and Binary Logistic Regressions of Prevalence of Functional Limitation (ADL/IADL), Chronic Diseases, Bodily Pain, and Cognitive Disability Symptoms (MMSE) on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables.....	24
Table 3.1 The sociodemographic characteristics of the White non-Hispanic participants, Midlife in the United States at baseline (2005).....	41
Table 3.2 Bivariate Correlation for Key Variables, Midlife in the United States.....	26
Table 3.3 Coefficients from the Ordinary Least Squares (OLS) of Overall Quality of Life, Perceived Control over Health, Self-rated Health, Current Health Quality, and Depressive Symptoms (log-transformed) on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables	42
Table 3.4 Odds Ratios from Ordered Logistic Regression of Self-rated Mental/Emotional Health and Health Comparison to People in the Same Age, Binary Logistic Regression of Prevalence of Functional Disability (ADL/IADL), Chronic Condition, and Bodily Pain on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables	45
Table 4.1 The sociodemographic characteristics of the participants residing in Seoul, Korean Longitudinal Study of Ageing at baseline (2008)	65
Table 4.2 The sociodemographic characteristics of the participants residing in Seoul, Korean Longitudinal Study of Ageing at baseline (2008)	66
Table 4.3 Bivariate Correlation for Key Variables, Midlife Development in Japan.....	73

Table 4.4 Bivariate Correlation for Key Variables, Korean Longitudinal Study of Ageing (Seoul).....	74
Table 4.5 Coefficients from the Ordinary Least Squares (OLS) Regression of Overall Life Satisfaction, Perceived Control over Health, Current Health Quality, and Depressive Symptoms on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables, MIDJA (JAPAN).....	67
Table 4.6 Coefficients from the Ordinary Least Squares (OLS) Regression of Overall Life Satisfaction, Perceived Current Health Quality, and Depressive Symptoms (CES-D10) on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables, KLoSA (Seoul, South Korea).....	68
Table 4.7 Odds Ratios from Binary Logistic Regression of Prevalence of Functional Disability (ADL/IADL), Chronic Condition, and Bodily Pain on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables, MIDJA (JAPAN)	69
Table 4.8 Odds Ratios from Ordered Logistic Regression of Self-Rated Health and Binary Logistic Regression of Prevalence of Functional Disability (ADL/IADL), Chronic Disease, Bodily Pain, and Cognitive Disability Symptoms (MMSE) on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables, KLoSA (Seoul, South Korea).....	70

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DEDICATION

To my forever loving and supporting God, parents, and my sister, Yejin.

CHAPTER ONE

Introduction

Health disparities have persisted over historical periods, despite the improvements in health care at different levels of units of analysis, including individuals, households, and countries (Adler and Newman, 2002; Braveman et al., 2005,2010; Elo, 2009). Research on the individual health disparities has been using objective measures of socioeconomic status (SES). Socioeconomic status is an individual's location in a socioeconomic structure, typically measured by education, income, occupation, and wealth. It is a consistent and strong robust predictor of an individual's health (Mirowsky and Ross, 2000; Robert and House, 2000; Yu and Williams, 1999). Objective SES provides specific resources: knowledge, financial resources, and levels of prestige. Decades of research has established both theoretical and empirical knowledge on the relationship between objective SES and health on individual, societal, and cross-cultural levels. The evidences reinforce that SES is one of the fundamental social causes of mortality and morbidity as well as mental and physical health (Green et al., 2010; Mirowsky and Ross, 2000; Ross and Mirowsky, 2006; Yu and Williams, 1999). Despite their persistent findings of SES as one of the fundamental social causes of health, how and why different SES measures matter is still a question among researchers. Part of the reason for this might be that no individual measure of SES completely captures the multidimensional nature of social status.

An emerging subject with increasing significance is one's subjective social status (SSS). Subjective social status indicates one's own perception of her/his social standing. This construct, however, has intrigued public health researchers and studies on health disparities in recent decades (Jackman and Jackman, 1973; Operario et al., 2004). Research findings show that SSS and objective SES are only moderately correlated, concluding that SSS captures more accurate and complicated aspect of social and economic life that objective SES indicators miss. In addition, the objective SES measures such as income and education consider everyone with the same level of socioeconomic resources, assuming these individuals experience their SES in the same way. On the other hand, the SSS measure requires a degree of social comparison, as one must reflect upon their relative position in the social hierarchy. As a result, it is suggested that SSS is capturing the unique variation within objective SES measures (Adler et al., 2000; Singh-Manoux et al., 2003; Lundberg and Kristenson, 2008; Wolff et al., 2009).

Health disparities literature provides emerging evidence that SSS has an independent association with the health net of SES (Garbarski, 2010; Quon and McGrath, 2014). Other findings suggest that SSS is in fact more strongly related to morbidity and mortality than SES (Adler et al., 2000; Singh-Manoux et al., 2003; Demakakos et al., 2008). Overall, research on SSS as an extensive measure in the social hierarchy has increased over the years. However, research on the consequences of SSS is dispersed, mostly cross-sectional, derived from non-representative studies of population, and mostly conducted in Western countries. Therefore, this study aims to examine the association between SSS and changes in health conditions and statuses in mid- and old-aged adult

samples from three nations by utilizing longitudinal and nationally representative datasets of South Korea, the United States, and Japan.

Objective vs. Subjective Socioeconomic Status

According to the fundamental cause perspective, a number of factors such as SES, sex, and social networks are known as “basic” social causes of health and illness (Link and Phelan, 1995; 2000). These social causes incorporate general resources (e.g., knowledge, money, power, prestige, and social relationships), which can be transformed into health-related resources, leading to multiple risk factor mechanisms and health outcomes in all historical times and geographical contexts. The objective SES indicators such as education, income, and occupation provide the most basic resources. Numerous recent findings across multiple nations provide evidences on the relationships between SES and a wide-range of health outcomes (Yu and Williams, 1999; Mirowsky et al., 2000; Ross and Mirowsky, 2006; Green et al., 2010).

Although objective SES measures have been considered the most valid and reliable predictors of social gradients and life chances, there are some contextual problems (Adler et al., 1994; Link and Phelan, 1995; Braveman et al., 2005). They apply a single fixed standard to all groups and are not sensitive to variability in the relative importance and value of certain social milestones. For example, the significance of educational attainment may be more magnified in individuals coming from an environment where social expectations regarding education are low. Comparatively, such individuals may ascribe to a different social hierarchy, which is discordant with societies where expectations about the value of certain achieved milestones may differ significantly. The importance of using education as an indicator of socioeconomic status

is underscored by its value to different subgroups of people. In conclusion, using objective SES measures alone to assess health outcomes neglects accounting for contextual factors surrounding individuals, which SSS considers.

Subjective Social Status (SSS) refers to “a person’s belief about his location in a status order” (Davis, 1956), namely, one’s self-perception of the individual’s socioeconomic status in comparison to others. One key element in one’s self-perceived social position is “relativity:” a comparison to other members in the society or any reference groups. Therefore it is closely linked to the notion of “relative deprivation” or “relative social standing” (Singh-Manoux et al., 2003). According to relative deprivation theory, individuals tend to make comparisons within a reference group. The theory claims that one’s relative position in the SES hierarchy matters more than one’s absolute level of SES. As a result, people “further down in the hierarchy would feel relatively deprived to others, marginalized and angry” (Link and Phelan 2000:37). All these cumulated stressful circumstances and feelings would in turn influence the individual’s well-being both directly and indirectly.

A materialist perspective assumes a strong correlation between objective SES and SSS since objective, material conditions are the foundation for every resource and element. This relationship suggests that SSS serves as a proxy for objective SES. However, Jackman and Jackman (1973) and recent findings (Adler et al., 2000; Singh-Manoux et al., 2003; Demakakos et al., 2008) indicate that people’s subjective belief about their social status. In other words, SSS can be a more powerful and consistent measure of overall health when compared to the objective SES indicators. Researchers suggest that SSS captures more complicated features of social and economic life than

traditional, which objective SES measures miss (Adler et al., 2000; Singh-Manoux et al., 2003; Demakakos et al., 2008; Bradshaw and Ellison, 2010). For example, educational attainment is traditionally measured categorically. However, not all college degrees are equal in social perception. Recipients of college degrees from Ivy League institutions attain greater symbolic status and value in terms of earning potential than those who received college degree from non-Ivy League colleges. Therefore, objective measures of education miss this specific social perception/ position whereas SSS may capture.

The traditional SES measurement of income reveals some of the same difficulties. Subjective social status may account for flexible dynamics such as purchasing power for goods and services or regional cost of living disparities, which are not included in the traditional income measurements. For instance, fifty thousand dollars carries different purchasing power in rural Texas than in Upper Manhattan. Therefore, although SSS correlates with objective SES indicators, it accounts for more nuances than the assumed materialist perspective of SES. In fact, asking respondents to rank their position compared to other residents in the country or community, is believed to capture an inherent element of relative status as well as their perceived connection to past, present, and future expected SES (Singh-Manoux et al., 2003; Andersson, 2015).

Interconnection between Objective Social Status, Subjective Social Status, and Health

Previous literature on health disparities confirms a strong relationship between subjective social status (SSS) and three main SES indicators, including education, income, and occupation (Ostrove et al., 2000; Wright and Steptoe, 2005; Dunn et al., 2006; Goldman et al., 2006; Cohen et al., 2008; Demakakos et al., 2008). The findings

show that increases in education, income, and occupational grade are all positively associated with better health outcomes.

Link and Phelan (1995) describe that while objective SES reflects inequality of accessing to material resources, which persist health disparities, SSS may help understand how inequality influences health through a stress process. The relative deprivation hypothesis suggests that those people who have lower income and education have worse health outcomes than those with higher income and education. This inequality results not simply from a lack of access to affordable social and economic resources, but because they experience stress that come from social comparison with others. In other words, those who experience a greater relative gap would have greater stress levels. These higher stress levels lead to worse health-related outcomes (Singh-Manoux et al., 2003; Wright and Steptoe, 2005; Adler, Epel, and Ickovics, 2000; Rabin and Charro, 2001; Haan, Kaplan, and Syme, 1989). These hypotheses and findings focus on the individual's experience of stress. They suggest that those who perceive themselves as having low social status are more likely to work in jobs with low autonomy, less power, low sense of control, and experience the same negative social phenomenon outside of the work environment (Wilkinson, 1999; Bjornstrom, 2011; Marmot, 2004). Bjornstrom (2011) states that as a result, these individuals are more likely to internalize this inequality and experience increasing levels of stress due to lack of social cohesion which all lead to physiological dysregulation and poor health outcomes.

In the last decade, public health researchers discovered that SSS has similar associations with health as objective SES does (Adler et al., 2000; Singh-Manoux et al., 2005; Demakakos et al., 2008). The findings also show that when SSS and objective SES

are adjusted in the model, SSS often persists as the stronger predictor of health outcomes than objective SES. Based upon previous findings, SSS therefore is salient yet under-researched aspect of objective SES that is associated with various health outcomes. One possible explanation of why the objective SES indicators- income and education- influence health outcomes is suggested in part by shaping perceptions of one's location in the status hierarchy of society. How individuals see themselves in relation to others has critical consequences for both mental and physical health beyond actual and material conditions (Adler et al., 2000; Singh-Manoux et al., 2005). Perhaps, this greater association between SSS and health is because despite the established evidences, which show that SES predicts a portion of SSS, there is still plenty of unexplained variance in the correlates of SSS.

Current Limitation

Notwithstanding the growing data collection of SSS and increasing evidences, most current findings and samples predominantly draw from Western countries. Very little research examines the relationship between SSS and health among Asian populations. Previous research done in Asia typically focuses on objective SES measures, primarily education and income, while neglecting subjective or self-perceived social status. East Asian countries (e.g., China, South Korea, Japan), which comprise one fifth of the whole world population and share similar Confucian heritage and culture, experience the largest increase in the proportion of ageing population. The evaluation of SSS and health associations with a focus on mid and later life adult populations in these Asian countries therefore is crucial, yet limited. The prior findings of SSS and health association with Western samples provide a good foundation and resources for my

dissertation. Furthermore, the current findings of the interrelationships between objective SES, SSS, and health from samples in the United States and other Western regions, are mostly taken from non-nationally representative and small samples. A systemic and empirical examination of the under-researched Asian population and a nationally representative sample offers a valuable lens which can advance our knowledge and address major gaps in current SSS and health research.

Research Agenda

The following study will address the above mentioned research gap in the cross-national health literature on SSS and health. This study further addresses the gap in the current data from a nationally representative sample. The goal of this dissertation is to disentangle SSS from objective SES and to examine whether SSS is independently associated with various health outcomes net of objective SES.

Each of the following chapters identifies and investigates an intersection of SSS, SES, and health in cross-national comparisons: mid and later life adults in South Korea, the United States, and a metropolitan area in Japan. Utilizing quantitative techniques and the most recent longitudinal and appropriate data available, in chapter two, I examine the relationship between subjective social status and various health outcomes with a nationally representative adult sample in South Korea. Chapter three addresses the link between subjective social status and health with nationally representative samples in the United States. The fourth chapter focuses on specific metropolitan regions: Tokyo, Japan, and Seoul, South Korea. Prior research finds that health outcomes distinctively differ between urban vs. rural areas. No existing literature examines SSS and health by comparing the data from multiple cities in Asian countries.

The final chapter highlights the conclusions that can be drawn from each analysis and this dissertation as a whole. It will provide cross-cultural explanations as well as outline possible areas for future research that extend the work featured here. Finally, I offer thoughts on the relationship between subjective social status and health as well as applications for policy in ageing societies.

CHAPTER TWO

The Association between Subjective Social Status and Health of Adults in South Korea

Introduction

Previous health literature focuses on the interpretation of an individual's socioeconomic status (SES) and health. Past findings suggest that an individual's SES plays an important role in maintaining good physical and mental health (Williams, 1990; Adler et al., 1994; Krause, Borawski-Clark, 1995; Adler and Ostrove, 1999). Eaton and colleagues (2001) claim that the relationship of SES and demographic characteristics; including gender, age, and marital status, is one of the most important aspects of the social structure for healthy life. The indicators of SES, such as income or education attainment, provide individuals access to social and economic resources as well as levels of consumption. One of the most firmly established finding in the cross-national health stratification literature is that individuals with lower SES have poor health than those who have higher SES, regardless of measurement and/or methodology. These studies relate lower SES to increased risks of deteriorating health, such as poor self-rated health, low life satisfaction, greater depressive symptoms, functional limitations, chronic disease incidences, and mortality (Marmot et al., 1987; Sobal and Stunkard, 1989; Anderson and Armstead, 1995; Yamazaki et al., 2005; Cohen, 2008; Chun et al., 2008; Park et al., 2009).

In addition to the current findings, some researchers demonstrate that access to health care is the key in eliminating socioeconomic disparities in health (Andrulis, 1998).

This concern would also suggest that universal coverage for health care would substantially reduce these disparities (Adler et al., 1993). However, even in European and Asian countries, which have universal coverage (e.g., England, Scandinavia, Japan, and South Korea), the SES-health gradient still exists (Adler et al., 1993). This persistent health gradient suggests that some other lesser studied factors may account for differential health outcomes amongst insured individuals across all social status groups.

Social position in a hierarchical society is multidimensional in nature (Jackman and Jackman, 1973; Bullock and Limbert, 2003). Yet, researchers often treat social status as exclusively represented by one's socioeconomic characteristics. Social status is dynamically communicated, not simply reducible to crude measures of the objective SES indicators. In fact, some researchers raise contextual problems when challenging the use of these standard indicators of SES as the "best" technique for capturing one's status in society (Adler et al., 2000; Goodman et al., 2005; Kopp et al., 2005; Singh-Manoux et al., 2005). Although objective SES measures are valid and reliable predictors of social gradients and life chances, they only apply a single fixed standard to all groups and are not sensitive to variability in the relative importance and value of purchasing power for goods and services or regional cost of living disparities. For instance, fifty thousand dollars means different in rural Texas than it does in Upper Manhattan. Therefore, SSS is correlated with objective SES indicators, but SSS is much more than a simple reflection of SES which a materialist perspective assumes. In fact, asking respondents to rank their position compared to other residents in the country or community, is believed to capture an inherent element of relative status and considered connecting to past, present, and future expectation of one's SES (Singh-Manoux et al., 2003; Andersson, 2015).

In recent years, there has been a growing interest in investigating SSS as an important health predictor in addition to the traditional objective SES measures. Subjective social status is an individual's perception of where he or she places himself or herself in a social hierarchy, relative to others (Davis 1956; Jackman and Jackman, 1973). Previous studies indeed found that SSS predicts numerous health outcomes including: self-rated health (Ostrove et al., 2000), cardiovascular disease risks (Gallo and Ghaed, 2007), cortisol habituation to repeated stress (Adler et al., 2000), and depression (Singh-Manoux et al., 2003). Even after adjusting for objective measures of SES and other covariates, SSS significantly predicted health (Ostrove et al., 2000; Singh-Manoux et al., 2003; Hu et al., 2005; Frazini and Fernandez-Esquer, 2006).

Health researchers argue that the way the individuals perceive situations may be just as consequential as the material conditions. According to the theory of relative deprivation, subjective comparisons are essential in affecting individual's reaction to objective situations (Walker and Smith, 2002). Some findings show biological evidence of the effect of the perceived social status on health. When individuals encounter threatening situations, their stress response system is activated (McEwen, 2000). Those individuals with low SSS may feel deprived relative to others, less optimistic about the future, feeling out of control, others look down on them (Link and Phelan, 1995; Wilkinson, 2005). These feelings and beliefs might trigger physiological stress responses that increase allostatic load over time, leading to poor mental and physical health outcomes (Ferraro and Shippee, 2009).

Subjective social status, furthermore, better measures the multifaceted nature of SES categories and better reflects internalized inequality, which is a key in health

disparities. While objective SES indicators reflect the overall differences in access to material resources that perpetuate health disparities (Link and Phelan, 1995), SSS taps into how inequality gets under the skin through a stress process. Scholars argue that those who internalized inequality and perceive themselves into a lower social status may feel greater stress and be less equipped to cope with this stress. This stress may lead to a decline of physiological functioning (Marmot 2004; Seeman et al., 2014). Although the literature currently reveals no clear pathway between SSS and health, the person's health outcome is likely strongly influenced by psychological, cultural, and environmental factors (Adler et al., 2000; Operario et al., 2004; Franzini and Fernandez-Esquer, 2006). Thus, SSS draws from a perceived closeness to others in these dimensions. While the objective SES indicators may denote one's place in society based on concrete measures, subjective measure of status refers to the gravity of one's social positioning. With this capability, SSS could also incorporate one's self-worth, a criterion that is not measurable through the objective measures of status.

Factors other than traditional objective SES, employment status and home ownership, which are also embedded in socioeconomic and cultural contexts, are considered additional elements of social standing that shape both mental and physical health. Some studies suggest that these characteristics serve as significant indicators of status, success, failure, security, and insecurity in most Western and Asian societies (Jackman, 1979; Mirowsky and Ross, 2003). Therefore, one expects that those with employment and home ownership would have higher life satisfaction and a healthier life than those who lack such contexts. These characteristics then help us understand the SSS and health linkage besides the conventional objective SES indicators.

Notwithstanding the growing body of work on SSS and health associations, most of the research has been conducted almost exclusively in Western countries and hardly in Asia. Several studies find that the relationship between SES and SSS may vary by ethnicity. Ostrove and colleagues (2000) find that SSS measure has an independent effect on self-rated health in a sample of white and Chinese-American women, but not in a sample of African-American and Latina women. Another study using biomarker data finds no significant relationship between SSS and physiological functioning indicators among North American and Japanese samples (Cornman et al., 2015). Thus, the relationship between ethnicity, SSS, and health remains unclear.

There have been numerous social changes in South Korea over several decades, including rapid economic growth and a sharply declining birthrate (Korean National Statistics Office, 2006). Nevertheless, a societal level of inequality is still prevalent which is reflected in the prevalence of disability and diseases, psychological distress, and death. A number of studies with a South Korean sample support a strong relationship between objective SES and health, including physical, mental, and subjective well-being (Son et al., 2002; Jang et al., 2009; Kim, 2011). However, compared to previous findings on objective SES, SSS, and health in other countries, very little is known about the relationship between SSS and health of adult population in South Korea (Kim et al., 2012). Studying SSS and examining its relation to various health outcomes is particularly important in South Korea. In fact, self-reported indicators that relates to well-being are reported among the lowest in the world even though the overall health for the population in South Korea is better than the average of Organization for Economic Co-operation and Development (Choi, Kim, and Park, 2015a; 2015b).

Based on the current research findings and gaps in the literature, this chapter therefore aims to investigate the association between objective SES, SSS, and a variety of psychological and physical health outcomes among mid- and old-aged adults in South Korea, using the Korean Longitudinal Study of Ageing (KLoSA). This study seeks to provide evidence for the impact of SSS on health independent of a number of objective SES indicators, such as education, income, and home ownership.

Data

This study draws on data from the second (2008) and the fifth (2014) waves of the Korean Longitudinal Study of Aging (KLoSA). The sample population of the KLoSA was selected by multistage, stratified, and cluster sampling (based on geographical area) to be representative of the nation. The survey is designed to identify and observe different dimensions of an aged society, build datasets that enable studies in different fields, and generate data comparable with similar panel studies in other countries (e.g. the U.S., Europe) that can provide the basis to implement effective social and economic policies. The KLoSA is conducted by Computer Assisted Personal Interviewing (CAPI) every two years, started in 2006 among the aged 45 and older living in households. While the first wave of the KLoSA was collected in 2006, the question on subjective social status (SSS) was only asked beginning at the second wave (2008). The analysis in this project therefore focus on the period in which the KLoSA asked respondents about subjective social status, from 2008-2014.

The second wave (2008) of the KLoSA has a total of 8688 and the fifth wave (2014) has a total N of 7029. The overall response rate for the individual was 89.2 percent for the second wave and 79.2 percent for the fifth wave of living longitudinal

participant. The KLoSA data are available at Employment Survey and Analysis (survey.keis.or.kr). All multivariate analyses have been adjusted by sample weights. A list of personal characteristics used in these analyses can be found in Table 2.1 along with minimum and maximum values for each.

Dependent Variables

This study uses eight outcome measures to assess the relationship between subjective social status and health in South Korea: Self-rated health, self-reported overall quality of life, health quality, depressive symptoms (CES-D10), functional difficulty (ADL/IADL), cognitive impairment symptom (MMSE), chronic disease diagnosis by physician, and bodily pain. All health outcome measures are self-reported.

The first focuses upon the outcome of self-reported physical and psychological health. First, for self-rated health, respondents were asked to rate their health on a five-point scale from excellent (1) to poor (5) which were reverse coded so that higher score indicates better health. Next, self-reported overall quality of life was measured with the question, “Compared to people of your age, how would you rate your overall quality of life?” and recorded each respondent’s current overall state on a vertical, visual analogue scale ranging from “best imaginable overall state” (100) to “worst imaginable overall state” (0). For perceived health quality, the question asks, “Compared to people of your age, how would you rate your current health satisfaction?” and recorded each respondent’s current overall state on a vertical, visual analogue scale ranging from “best imaginable overall state” (100) to “worst imaginable overall state” (0). Lastly, the Korean version of the short-form (10-item) Center for Epidemiological studies of Depression (CES-D10) scale was used to assess the respondent’s depressive symptoms during the

most recent week. The negatively phrased eight items (loss of interest, trouble concentrating, feeling depressed, feeling tired or low in energy, feeling afraid, trouble falling asleep, feeling alone, and hard to get going), and two positively phrased items, which were reverse coded (feel very good, generally satisfied), ranged from 0 to 3; Very rarely or less than once a day; Sometimes or 1-2 days during the past week; Often or 3-4 days during the past week; Almost always or 5-7 days during the past week. All ten items were summed and higher number indicates more depressive symptoms for the respondent. The alpha reliability coefficient for the index was 0.83.

The second focuses on the prevalence of various physical health outcomes. First, self-reported functional limitations (ADL/IADL) was assessed with a measure with the Korean version of Instrumental Activities of Daily Living (IADL)/ Activities of Daily Living (ADL) disability on the same underlying continuous dimension. A summation of seven ADLs (eating, dressing, transferring, toileting, and bathing) and ten IADL items (preparing meals, using the telephone, cleaning one's room, shopping, using transportation, walking outside with or without walking aids, and using stairs) was recoded as binary (1= need any help). The alpha reliability coefficient for the index was 0.94. Next, the measure of cognitive functioning was assessed with the Korean version of the Mini-Mental State Examination (K-MMSE) which is a widely used screening tool for cognitive impairment and dementia diagnosis. A total of 19 items were scored with a maximum of 30 points. Based on the K-MMSE score, cognitive impairment was defined as scoring 17 points or less and recoded as binary (1= impaired). The alpha reliability coefficient for the index was 0.88. The physician-diagnosed eight chronic conditions (hypertension, diabetes, cancer, lung disease, cardiovascular, liver disease,

cerebrovascular disease, and arthritis) since the second wave (2008) were used. The items were summed and coded as binary (1= having any diagnosis). Lastly, the self-reported any bodily pain was asked if the person currently has any pain in the body and recoded as binary (1= any bodily pain).

Table 2.1

The sociodemographic characteristics of the participants, Korean Longitudinal Study of Ageing at baseline (2008)

Variables	N	Mean	SD	Minimum	Maximum
Subjective social status	8684	2.58	1.14	1	6
Health Outcomes					
Self-rated health (1-5)	8688	2.66	1.01	1	5
CES-D10	8688	3.76	3.19	0	10
Overall life satisfaction	8683	60.99	19.2	0	100
Current health satisfaction	8686	56.99	22.13	0	100
IADL/ADL (difficulty=1)	8688	0.11	0.33	0	1
K-MMSE (any symptom=1)	8374	0.24	0.43	0	1
Chronic disease (any=1)	8688	0.097	0.29	0	1
Prevalence bodily pain (any=1)	8688	0.62	0.48	0	1
Demographic Covariates					
Age	8688	60.24	10.91	47	99
Sex (Male=1)	8688	0.47	0.49	0	1
Married (=1)	8688	0.8	0.43	0	1
Education (1-4)	8685	2.2	10.6	1	4
Family Income from past year	8514	4.99	2.73	1	10
House (owned=1)	8688	0.79	0.41	0	1
Currently employed (=1)	8688	0.5	0.49	0	1
Urban (=1)	8688	0.45	0.49	0	1
Friendship contact	8688	2.04	1.02	1	4
Number of people living in a household	7763	2.99	1.34	1	9
Health behavior covariates					
Smoking (current=2, past=1)	8687	0.55	0.78	0	2
Alcohol (current=2, past=1)	8688	1.07	0.93	0	2
Exercise regularly (=1)	8688	0.37	0.47	0	1

Independent Variables of Interest

The independent variable of interest is measuring respondents' subjective social status. The question asked respondents to assess their socioeconomic status and rank themselves. Possible responses were "Lower Lower Class," "Upper Lower Class," "Lower Middle Class," "Upper Middle Class," "Lower Upper Class," and "Upper Upper Class." Higher values corresponded to higher subjective social class (1= Lower Lower Class to 6= Upper Upper Class).

Control Variables

Building upon past research analyzing health outcomes, the study includes a variety of socio-demographic and health-related behavior variables as a baseline. Demographic variables are age (in years), gender (1= male), annual household income (1=\$3,500 or less to 10=\$ 55,000 or more), education in four categories (1= elementary school or lower to 4= college degree or higher), marital status (1= married), home ownership (1=owned), employment (1= currently employed), number of household member (numbers). Frequency of interacting with close friends is used as a social support measure. The question asks "How often do you see your close friends?" Responses are coded into four categories (1= almost none to 4= more than once a week). Cigarette smoking (2= current, 1=past, 0=never), alcohol drinking (1= current), and exercise (1=yes) are used for health-related behaviors. Each exhibited a significant association with various health outcomes among the mid-and-later life adults in past research.

Methodology

Analysis will begin with a bivariate correlation for all tested variables in this study. I then move to multivariate analysis of these relationships¹. The first set of multivariate analysis is done by performing Ordinary Least Square (OLS) regression to investigate the association between subjective social status and perceived overall quality of life, health satisfaction, and depressive symptoms². Due to unequal proportions within self-rated health status, Ordered Logistic Regression is performed. Next, because measures of prevalence symptom in functional disability (ADL/IADL), cognitive impairment (K-MMSE), bodily pain, and chronic disease diagnosis are coded as binary, I use binary logistic regression to estimate the probability of reporting symptoms and diagnoses. All models are weighted and adjusted by control variables, including health results of the baseline survey data. In addition, Table A1 and Table A2 in Appendix present the bivariate relationship between SSS and health outcomes as well as the influence of main control variables on SSS and health. The results in Table A1 and Table A2 will be discussed in Chapter Five.

Results

Table 2.2 presents bivariate Pearson correlation for all tested variables in this study. Education and family income, both similarly have stronger bivariate correlation with most of dependent variables followed by subjective social status and age. Subjective

¹ Analyses were conducted on missing data to ensure that excluded respondents do not differ significantly on the dependent measure compared to those respondents retained in the analysis. I found no significant differences.

² Multicollinearity is a common concern when subjective social status is present with socioeconomic variables in a regression model. Variance inflation scores for the independent variables never exceeded 1.9 in any model. Therefore, multicollinearity does not appear to adversely affect the results.

social status shows the highest correlation coefficient with self-reported overall quality of life.

Table 2.3 contains the results for multivariate regression models. Model 1 demonstrates prediction on self-reported overall life satisfaction compared to others in the same age. Consistent with past research on this topic, I find that those who perceive themselves in a higher social status are more likely to report greater overall life satisfaction. Male, household size, and alcohol consumption fail to achieve a significant association with self-reported overall life satisfaction. Model 2 explains prediction on self-reported health satisfaction compared to others in the same age. Net of all controls, the subjective social status shows a highly significant relationship with changes in current health satisfaction. Age, education attainment, being employed, family income, home ownership, and frequency of contact with friends show a significant link with health satisfaction. Lastly, in Model 3, SSS shows significance predicting self-reported depressive symptoms. After controlling all covariates and the baseline effects, I find those who perceive higher in social status are less likely to report depressive symptoms. Depressive symptoms show a significant relationship with education, family income, household size, frequency of contact with friends, and residing in urban areas.

Table 2.4 demonstrates the results for ordered logistic regression predicting self-rated health and binary logistic regressions predicting prevalence of various health outcomes: functional limitation (ADL/IADL), chronic disease diagnosis, bodily pain, and cognitive disability (MMSE). Model 1 assesses the ordered logistic regressions analysis on self-rated health. Accounting for sociodemographic and other covariates, SSS shows a significant and higher likelihood of reporting better self-rated health. I find that men have

1.26 greater odds of better self-rated health, and fulltime employment have 1.23 greater odds to report better self-rated health.

Model 2 assesses prediction on prevalence of any functional limitation (ADL/IADL). I find that those who perceive themselves higher in social standing, net of all controls, are 20 percent less likely to report any functional limitation. Increases in age, men, living in a larger household size, and alcohol consumption are increases the odds of reporting any functional limitation whereas being married decreases these odds by 27 percent.

Model 3 introduces binary logistic regression on predicting chronic disease diagnosis by a physician since the previous survey. Subjective social status fails to achieve a significant relationship. Only age is significantly associated with higher odds of reporting a number of chronic diseases. Next, Model 4 looks at predicting bodily pain. I find that those who perceive themselves higher in social status are about 14 percent less likely to report any bodily pain. Mid- and old-aged men, educational attainment, family income, residing in urban, and regular exercise show lower odds of reporting any bodily pain. Increases in age and household size on the other hand, show higher odds. It is noted that mid- and old-aged men have 50% lower odds to report having any bodily pain than women. Lastly, model 5 focuses on predicting symptoms on cognitive disability (MMSE). Subjective social status is negatively correlated with the odds of reporting signs of cognitive disability. Educational attainment, being married, and residing urban area also show a significant lower odds. On the other hand, increases in age shows higher odds of reporting any sign of cognitive disability. It is noted that educational attainment

and being married decreases the likelihood on reporting any negative symptom on cognitive disability (MMSE) by 25 percent.

Conclusion

In this chapter, I investigate the effects of objective socioeconomic status (SES) and subjective social status (SSS) upon various health outcomes of mid- and old-age adults in South Korea. The main objective was to understand the relationships between SES, SSS, and health in the understudied population, paying particular attention to SSS. The analysis in this study yields a few meaningful findings that present a somewhat different pattern of the SES-health relationship among mid- and old-age adults in South Korea than other previous findings presented from Western samples.

First, as the models show, nearly all measures of SSS, net of all covariates, are strongly related to health outcomes, suggesting that SSS independently predict various health statuses above and beyond traditional indicators. Traditional measures of SES such as family income and employment status show less consistent and less strong relationship with health outcomes in this study. Thus, these findings imply that the sense of “relative” social standing, rather than the “actual” status, carries more notable physical and mental health consequences for mid- and old-age adults in South Korea.

Table 2.3

Ordinary Least Square (OLS) Coefficients from the Regression of Overall Life Satisfaction, Current Health Quality, and Depressive Symptoms (CES-D10) in Subjective Social Status (SSS), Health behaviors, and Sociodemographic Control Variables

Variables	Model 1 Overall Life Satisfaction	Model 2 Perceived Health satisfaction	Model 3 Depressive Symptoms
Previous health outcome	0.234*** (.256)	0.254*** (.269)	0.220*** (.264)
Subjective social status (SSS)	2.702*** (.173)	2.256*** (.158)	-0.079* (-.035)
Age	-0.138*** (-.072)	-0.379*** (-.174)	-0.005 (.083)
Male (=1)	-0.003 (-.008)	0.649 (.020)	-0.128 (.002)
Education	0.617** (.037)	1.200*** (.098)	-0.113** (-.016)
Married(=1)	2.669*** (.061)	0.544 (.013)	0.11 (-.043)
Employed (=1)	1.742*** (.053)	1.789*** (.044)	-0.153 (-.049)
House (own=1)	3.047*** (.077)	1.650** (.039)	-0.042 (-.038)
Family income	0.268** (.058)	0.490*** (.082)	-0.042* (-.039)
Number of people in the household	-0.255 (-.023)	-0.148 (-.020)	-0.070* (-.002)
Friendship contact	1.806*** (.106)	0.635** (.028)	-0.215*** (-.090)
Urban (=1)	-0.781* (.000)	-0.023 (-.000)	-0.401*** (-.068)
Cigarette smoking	-0.843** (-.037)	-0.369 (-.013)	0.039 (.030)
Alcohol drinking	-0.111 (-.010)	0.016 (.004)	0.053 (.014)
Exercise (=1)	1.230** (.032)	0.794 (.018)	0.132 (-.002)
Intercept	36.07***	50.92***	4.605***
N	6574	6575	7585
Adjusted R-square	0.28	0.29	0.08

Source: Korean Longitudinal Study of Ageing 2008-2014

All values weighted, * <.05 ** <.01 ***<.001

Standardized coefficients (**B**) (in brackets)

Table 2.4

Odds Ratios from Ordered Logistic Regression of Self-rated Health and Binary Logistic Regressions of Prevalence of Functional Limitation (ADL/IADL), Chronic Diseases, Bodily Pain, and Cognitive Disability Symptoms (MMSE) on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables

Variables	Model 1 Self-rated Health	Model 2 Functional Limitation ADL/IADL	Model 3 Chronic Disease Diagnosis	Model 4 Bodily Pain	Model 5 Cognitive Disability MMSE
Previous health outcome	1.893*** (.347)	9.53*** (.357)	0.675 (-.075)	2.962*** (.285)	4.356*** (.353)
Subjective social status (SSS)	1.129*** (.069)	0.799*** (-.156)	0.953 (-.018)	0.863*** (-.107)	0.854*** (-.090)
Age	0.956*** (-.241)	1.08*** (.417)	0.991** (-.057)	1.036*** (.191)	1.08*** (.414)
Male (=1)	1.258*** (.059)	1.61*** (.111)	1.213 (.053)	0.487*** (-.209)	0.735** (-.091)
Education	1.130*** (.076)	0.95 (-.027)	0.913 (-.013)	0.847*** (-.106)	0.748*** (-.174)
Married(=1)	0.931 (-.018)	0.725** (-.062)	1.117 (.036)	1.052 (.021)	0.884* (-.028)
Employed (=1)	1.234*** (.052)	0.833 (-.048)	1.211 (.065)	1.073 (.023)	0.897 (-.015)
House (own=1)	1.189** (.045)	0.936 (-.008)	1.044 (.014)	1.211* (.036)	1.126 (.027)
Family income	1.055*** (.092)	1.034 (.045)	1.012 (-.004)	0.945*** (-.071)	1.015 (-.001)
Number of people in the household	0.935*** (-.047)	1.094* (.070)	1.05 (.045)	1.039** (.022)	0.967 (-.010)
Friendship contact	1.076** (.040)	1.057 (.032)	0.959 (.303)	0.914 (-.037)	0.942 (-.022)

(continued)

Odds Ratios from Ordered Logistic Regression of Self-rated Health and Binary Logistic Regressions of Prevalence of Functional Limitation (ADL/IADL), Chronic Diseases, Bodily Pain, and Cognitive Disability Symptoms (MMSE) on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables

	Model 1	Model 2	Model 3	Model 4	Model 5
Variables	Self-rated Health	Functional Limitation ADL/IADL	Chronic Disease Diagnosis	Bodily Pain	Cognitive Disability MMSE
Urban (=1)	1.166** (.048)	1.065 (.007)	1.13 (.061)	0.804*** (-.056)	0.712*** (-.088)
Cigarette smoking	0.908** (-.045)	1.18* (.062)	1.007 (-.064)	1.015 (.012)	1.03 (.009)
Alcohol drinking	1.083** (.038)	1.146* (.060)	1.027 (-.042)	1.03 (.012)	1.04 (.009)
Exercise (=1)	1.061 (.010)	1.125 (.033)	1.082 (-.025)	0.821** (-.052)	0.91 (-.034)
N	6990	6578	7628	6578	6119
Adjusted R-square	0.29	0.32	0.012	0.28	0.41

Source: Korean Longitudinal Study of Ageing 2008-2014

All values weighted, * <.05 ** <.01 ***<.001

Standardized coefficients (**B**) (in brackets)

Table 2.2

Bivariate Correlation for Key Variables, Korean Longitudinal Study of Ageing

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
2	.28																				
3	.41	.63																			
4	-.21	-.22	-.29																		
5	-.24	-.23	-.32	.24																	
6	-.20	-.33	-.36	.25	.36																
7	.04	-.01	-.03	.02	.01	.06															
8	-.28	-.19	-.29	.11	.25	.23	.01														
9	.25	.42	.34	-.09	-.14	-.09	-.00	-.19													
10	-.39	-.21	-.36	.20	.29	.07	-.03	.29	-.18												
11	.12	.06	.13	.04	-.15	-.08	.01	-.27	.05	-.10											
12	.17	.23	.20	-.09	-.13	-.04	.03	-.15	.24	-.34	.25										
13	.34	.24	.33	-.11	-.30	-.13	.01	-.33	.35	-.50	.31	.28									
14	.33	.29	.34	-.10	-.22	-.13	.01	-.27	.48	-.45	.11	.28	.28								
15	.05	.20	.09	.00	.04	.00	.01	.01	.32	.07	.01	.12	.12	.13							
16	.26	.16	.23	-.11	-.15	-.07	.03	-.18	.12	-.44	.34	.22	.22	.29	.00						
17	.08	-.05	.03	-.00	-.10	-.08	.02	-.08	-.01	-.09	.00	.02	.02	.08	-.15	-.03					
18	.02	.15	.06	.00	.03	-.05	-.01	.02	.06	.02	-.1	.02	.02	-.03	.09	.01	-.03				
19	.14	.11	.15	-.02	-.14	-.09	.02	-.13	.17	-.27	.10	.24	.24	.46	.04	.13	.11	-.02			
20	.04	-.04	.05	.02	-.09	-.04	.00	-.16	-.06	-.12	.62	.08	.08	.04	-.07	.24	.02	-.07	.05		
21	-.11	-.06	-.13	.04	.14	.06	-.02	.19	-.06	.22	-.52	-.16	-.16	-.16	.01	-.30	-.03	.03	-.07	-.45	
22	.1	.15	.13	-.01	-.08	-.03	0	-.12	.23	-.10	.05	.10	.10	.15	.05	-.07	.06	.07	.02	-.03	-.05

1. Self-rated health 2. Overall life satisfaction 3. Health satisfaction 4. ADL/IADL 5. MMSE 6. CES-D10 7. Chronic disease (yes=1) 8. Bodily pain (yes=1) 9. Subjective Social Status (SSS) 10. Age 11. Sex (male=1) 12. Married 13. Education 14. Family income 15. House (owned=1) 16. Employed (current=1) 17. Urban (=1) 18. Friendship Contact 19. Number people in household 20. Cigarette smoking 21. Alcohol drinking 22. Exercise

Next, my analyses indicate that among objective SES indicators, educational level is the most consistent predictor for most of the health outcomes. This finding shows that education has a profound impact on an individual's health particularly in this case of South Korean sample. Regarding educational attainment which is likely to have occurred in early adulthood and the average age of the sample is around 45, yet education remains consistently powerful predictive of nearly all health conditions, except functional limitation (ADL/IADL) and chronic diseases, showing that later life health condition may be determined by an element of past achievement. This finding is consistent with past research indicating educational attainment is linked with health (Singh-Manoux et al., 2003).

Objective SES, SSS, demographic and health behavior variables account for 40 percent of the variance in cognitive disability test (MMSE) and about 30 percent of the variance in all subjective self-perceived health and life satisfaction measures as well as the functional limitation (ADL/IADL) and bodily pain measures. On the other hand, other health measures such as depressive symptoms and chronic condition measures account for less than 1 percent. Therefore, future research should explore other likely predictors of depressive symptoms and chronic diseases for mid- and old-age adult population in South Korea.

While this study has proposed a variety of elements for SSS and health associations, there are some limitations. First, there may be other unobserved factors affecting the linkage between SSS and health. I employ a longitudinal design, utilizing two waves, but it does not provide direct evidence regarding the causal direction between SSS and health. In this longitudinal design, however, I could control for an extensive set

of variables (and more than any previous research) in the association between SSS and health of mid- and old-age adults. Further multiple waves of longitudinal analyses are needed to tease out the causal directions to provide insights into the health causation debates as well as to evaluate lifetime somatic symptoms such as depressive symptoms and chronic conditions.

Second, regarding the nature of SSS as a multidimensional construct, the future study should evaluate SSS across multiple levels within the social statuses. Subjective social status is a measure that relies solely on the perspective of the individual assessing their own socioeconomic circumstances. To ascertain one's social status, however, a comparison group must be present because an individual's assessment is not confined to the characteristics of the individual only. In order to evaluate SSS across multiple levels, neighborhood characteristics may play a significant role in discovering how SSS is influenced. Because people not only associate themselves with living in the nation, but they also associate with smaller and more immediate environments such as neighborhoods, the prospect studies should consider assessing neighborhood measure in SSS-health research. Therefore, including the neighborhood and social climate one lives in may provide more information regarding the influence of one's individual level characteristics on SSS and the role of neighborhood context in SSS (Aneshensel, 2008; Wheaton and Clarke, 2003).

Lastly, several studies argue that economic status has a stronger influence on adults' and older adults' health than the level of education. In other words, the elderly people are no longer in need of education to determine their social position, and economic problems not only are a direct cause of stress, but also affect it indirectly by

influencing nutrition, life-style, and dependence on others, especially on family members (Adler and Ostrove, 1999). The literature suggests that both education and economic status have a direct and an indirect influence on health, especially for elderly people. Thus, future research should consider elaborating measurements of wealth such as assets (e.g., vehicle, stocks and mutual funds, etc.). A promising research direction is to analyze how dynamic changes of SES is associated with changes of SSS and health by utilizing longitudinal data with multiple time points, would amplify knowledge on the health effects of SES indicators over the life course.

Despite the limitations, this chapter contributes to the literature on SES-health gradient by examining the health effects of a new measure, SSS, upon an under-researched population, South Koreans. The findings of the study underscore the role of self-perceived social status in affecting the health of mid- and old-age adults in Asia, and have implications for future research on the SES and health literature. The future studies should take into account including SSS when studying the SES-health gradient among other Asian populations as well as different racial or ethnic groups in the United States or other countries.

Regardless of the rapid increase in average life expectancy and a stable gap in mortality rate between socioeconomic statuses since the 1990s, socioeconomic disparities in health have been increasing across the globe. The risk of unmet health care need was also much higher among older adults in South Korea regardless of the fact that South Korea has a universal health care system (Kwon, 2007). Therefore, it is critical not only to monitor trends in general socioeconomic health inequalities but also to identify and

investigate vulnerable subgroups in the population whose needs, particularly health, are persistently not being met.

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CHAPTER THREE

The Association between Subjective Social Status and Health of Adults in the United States

Introduction

Social conditions and structures inherently shape the population distribution of health, disease, and well-being. In the United States, health to a large extent is stratified by socioeconomic position (Williams and Collins, 1995). The impact of one's socioeconomic status (SES) on health has been found through numerous theoretical and empirical knowledge that SES serves as one of the most fundamental, consistent and robust predictors of health over the human life course (Mirowsky et al., 2000; Robert and House, 2000).

Early research on health inequalities developed from an interest in the patterning of health by SES such as education, income, and occupation. The researchers have been emphasizing that one's social status has important social (Lindbeck, 1999), economic (McIntyre et al., 2006), biological (Sapolsky, 2005), and psychological consequences (Zink et al., 2008). However, the effects of one's social status on the consequences describe above have varied by different SES levels. Having a higher SES in fact would have little significance unless there is a comparison group: lower SES individuals. Therefore, the importance of having a higher SES is underscored by the other lower group, being advantaged over another in some regard. Recognition of one's SES essentially entails an awareness of the SES of other individuals, bringing significance to one's relative status in society (Marmot, 2005).

Although the objective SES indicators are often used to determine one's social position in society, these early studies were conducted to emphasize the significance of relative social position and how subjective social status (SSS), which is defined as a person's belief regarding her/his position in the social hierarchy, provides us with more information about the status attribution process. For example, evidence from the Whitehall civil servant studies (Marmot et al., 1991; 2005) and research examining primate hierarchies (Sapolsky, 2004) show that social gradients are related to health (Brunner, 1997). In both studies, higher social rank is positively associated with better health. The primate social status research clarifies more about the health implications of social rank than human research could accomplish because it demonstrates that poorer health is not simply attributable to socioeconomic resources. Those primates in the study are uneducated, unemployed, and know nothing of health behaviors yet they still show a social gradient in health (Marmot, 2005). Therefore, the health linkage regardless of the absence of these factors in the primates study, suggests that one's relative social position in a social hierarchy may be an important indicator for health.

Subjective social status is an individual's perception of her/ his own position in a social hierarchy relative to others (Davis, 1956; Jackman and Jackman, 1973). Researchers caution that while the conventional objective measures have been widely used as reliable and valid predictors of social gradients and life changes, a propensity of these indicators to make contextual errors such that success in one area does not represent the success in other areas. They suggest that SSS captures more complicated features of social and economic life that are missed in objective SES measures (Adler et al., 2000; Singh-Manoux et al., 2003; Demakakos et al., 2008; Bradshaw and Ellison, 2010). For

example, educational attainment is traditionally measured categorically. However, not all college degrees are equal in social perception. Recipients of college degrees from Ivy League institutions attain greater symbolic status and value in terms of earning potential than those who received a college degree from non-Ivy League colleges. This notion indicates that objective measures of education miss this specific content whereas SSS may capture the underlying content. Subjective measures of social status therefore capture the “value” of objective measures while simultaneously accounting for the context in which relative social position is determined.

There has been no clear pathway established between SSS and health in the literature, it is highly expected to be influenced by psychological, social, cultural, and environmental factors (Adler et al., 2000; Operario et al., 2004; Franzini and Fernandez-Esquer, 2006). Wilkinson (1996) assumes that among those four factors, the psychological component may be most directly related to SSS since the link between subjective social standing relative to others in society and health is influenced by relative inequality. Status variance due to a discrepancy between one’s perceived lower standing and the higher SSS of others in society may produce negative emotions which then translate into poorer health through neuroendocrine mechanisms (Singh-Manoux et al., 2005). The evidence in the baboon study also suggested that those baboons that are low in the social hierarchy showed elevated stress hormones compared to their higher status counterparts (Sapolsky, 2005; Marnot, 2005). Additionally, being dissimilar in perceived status can also negatively influence health if people internalize that they are less valuable than others. This stress is highly associated with poorer health behaviors such as smoking, increased alcohol consumptions, may further increase one’s risk for worse

health outcomes (Moren-Cross et al., 2006). SSS may influence health by the psychological response that is evoked when people compare themselves to others and perceive themselves to be relatively dissimilar in status (Wilkinson, 1996; Wilkinson and Pickett, 2006). People dissatisfied with how they compare to their neighbors and peers, may demonstrate poorer psychological health. This phenomenon is reflected in the literature which shows that low SSS leads to distress, negative affect, pessimism, depression, etc. (Adler et al., 2000; Reitzel et al., 2007).

Previous research has shown findings on SSS being an important predictor of health outcomes including: self-rated health (Ostrove et al., 2000), cardiovascular disease risks (Gallo and Ghaed, 2007), cortisol habituation to repeated stress (Adler et al., 2000), and depression (Singh-Manoux et al., 2003). Even after adjusting for objective measures of SES and other covariates, SSS significantly predicted several aspects of health (Ostrove et al., 2000; Singh-Manoux et al., 2003; Hu et al., 2005; Frazini and Fernandez-Esquer, 2006). To our current knowledge, most of the studies did not use nationally representative population samples but utilized only cross-sectional datasets. Therefore, the goal of this chapter is to examine the relationship between SES, SSS and a wide-range of health outcomes both mental and physical by utilizing longitudinal datasets with a nationally representative sample of mid and old-age adults in the United States.

Data

Data for this study are drawn from the second (2004-2006) and the third waves (2013-2014) of the national survey of Midlife Development in the United States (MIDUS). The MIDUS study was initially conducted by the MacArthur Foundation Research Network on Successful Midlife Development in 1995-1996. MIDUS is based

on a nationally representative random-digit-dial (RDD) sample of noninstitutionalized, English-speaking adults, selected from working telephone banks in the coterminous United States. The MIDUS respondents completed the initial telephone interviews and returned self-administered questionnaires (SAQs). With support from the National Institute on Aging, a follow-up study and attempted to re-contact original MIDUS participants. There was no additional sampling of cases for the longitudinal component of MIDUSII. A third wave of survey data was collected on longitudinal participants, largely repeated baseline assessments.

While the first wave of the MIDUS was collected in 1995-1996, the question on subjective social status only included beginning at the second wave (2004-2006). The analysis in this project therefore focus on the period in which the MIDUS respondents about subjective social status, from 2004-2014. The overall response rate for the main RDD respondents were 71 percent for the second wave and 77 percent telephone interview and self-administered questionnaire was 84 percent for the third wave of living longitudinal participants. In this project, I have restricted the sample to individuals that are White, non-Hispanic respondents only within a national probability sample in order to match with datasets from South Korea and Japan which did not collect race or ethnicity information. Previous studies have shown that the nature and extent of parameters influencing SSs significantly differ across racial and ethnic groups (Adler et al., 2008; Franzini and Fernandez-Esquer, 2006). A list of personal characteristics used in these analyses can be found in Table 3.1 along with minimum and maximum values for each. The MIDUS data are available at Institute for Social Research (www.icpsr.umich.edu).

Dependent Variables

The ten dependent Variables used in this analysis measure various physical and psychological health outcomes. The first focuses upon self-rated health-related outcomes: self-rated physical health, self-rated emotional/mental health, and self-rated health comparison. The questions ask, “In general, would you say your physical health is excellent, very good, good fair or poor?”, “What about your mental or emotional health?” Possible responses for both questions are “excellent” (coded 5), “very good” (coded 4), “good” (coded 3), “fair” (coded 2) or “poor” (coded 1) to indicate higher values as better health. The question on self-rated health comparison asks “In general, compared to most men/women your age, would you say your health is much better, somewhat better, about the same, somewhat worse, or much worse?” Possible responses are “much better” (coded 5), “somewhat better” (coded 4), “about the same” (coded 3), “somewhat worse” (coded 2), or “much worse” (coded 1) to indicate higher score as better health. Next, the overall life and health satisfaction were measured. The questions asks, “Using a scale from 0 to 10 where 0 means “the worse possible life overall” and 10 means “the best possible life overall” how would you rate your life overall these days?” and “Using a scale from 0 to 10 where 0 means “the worse possible health” and 10 means “the best possible health” how would you rate your health these days?” and perception over one’s control over health asks ““Using a scale from 0 to 10 where 0 means “no control at all” and 10 means “very much control” how would you rate the amount of control you have over health these days?” A higher score indicates better health outcome.

The depressive symptoms variable was measured based on 6 items. The questions ask, “During the past 30 days, how much of the time did you feel: so sad nothing could

cheer you up? Nervous? Restless or fidgety? Hopeless? That everything was an effort? Worthless?” Possible answers were 1= all of the time, 2= most of the time, 3= some of the time, 4= a little of the time, and 5= none of the time. Scales are constructed by calculating the mean across each set of items. Items were recoded so that higher scores reflect higher levels of negative affect. The alpha reliability coefficient for the index is 0.85. The measure was natural-log adjusted to account for a negatively skewed sample distribution.

The second focuses on a prevalent symptom in functional limitation (ADL/IADL), chronic conditions, and bodily pain. First, self-reported functional limitation (ADL/IADL) was assessed with a measure of Instrumental Activities of Daily Living (IADL)/ Activities of Daily Living (ADL) disability. A summation of three ADLs (e.g. bathing, climbing stairs, walking a block) and six IADL tasks (e.g. lifting groceries, bending, walking more than a mile, walking several blocks, vigorous activities, moderate activities) was recoded as binary (1= any difficulty). Next, self-reported having any chronic condition was used by taking the total number of “yes” responses to have experienced in the past 12 months. A summation of 30 items was recoded as binary (1= any chronic condition). Lastly self-reported bodily pain was used with a question “During the past 30 days have you taken prescription medicine for any of the following conditions, PAIN?” The measure was coded as binary (1= yes).

Independent Variables of Interest

The independent variable of interest is a linear operationalization of subjective social status. MIDUS uses the MacArthur Scale of SSS which asks with a picture of a ladder, “Think of this ladder as representing where people stand in their communities.

People define community in different ways; please define it in whatever way is most meaningful to you. At the top of the ladder (coded 10) are the people who have the highest standing in their community. At the bottom (coded 1) are the people who have the lowest standing in their community. Where would you place yourself on this ladder?" The possible answers are reverse coded to indicate higher score better standing in their community. The measure has been found to be a valid and reliable construct for gauging SSS in a number of populations and surveys (Singh Manoux et al., 2003, Goldman et al., 2006; Cundiff et al., 2013).

Control Variables

In addition to the above key independent variables, the study includes a host of socio-demographic and health behavior variables at baseline that are often associated with health outcomes in sociological models. Demographic variables are age (in years), gender (1=male), household income (1=\$10,000 or less to 11=\$ 150,000 or more), education (1= no school/ some grade school to 12=PH.D., MD, JD, or other professional degree), marital status (1= married), home ownership (1=owned), employment (1= currently employed), number of household member beside children or self (numbers). Friend support is measured using the four questions: "how much do your friends really care about you?" "How much do they understand the way you feel about things?" "How much can you rely on them for help if you have a serious problem?" and "How much can you open up to them if you need to talk about your worries?" Possible responses are 1=A lot, 2=Some, 3=A little, and 4=Not at all. Scales are constructed by calculating the mean of the values of the items in each scale. Items were reverse-coded so that high scores reflect greater friend support. The alpha reliability coefficient for the index is 0.86.

Cigarette smoking (2=current, 1=past, 0=never), alcohol drinking (1= current), and exercise (1=yes) are used for health-related behaviors.

Methodology

I first provide a bivariate correlation for all tested variables in this study. I then move to multivariate analysis of these relationships¹. The first set of multivariate analysis (Table 3.3) is done by performing Ordinary Least Square (OLS) regression to investigate the association between subjective social status and self-reported overall quality of life (Model 1), perceived control over health (Model 2), self-rated health (Model 3), current health quality (Model 4), and depressive symptoms (Model 5). In Table 3.4, due to unequal proportion within self-rated mental/emotional health (Model 1) and health comparison to others in the same age (Model 2), Ordered Logistic Regression was performed. Lastly, to describe the effects of subjective social status on the prevalence of functional disability (ADL/IADL) (Model 3), chronic condition (Model 4), and bodily pain (Model 5), I estimate logistic regression models predicting the likelihood of having the condition. All models are adjusted by control variables, including health results of the baseline survey data. In addition, Table A3 and Table A4 in Appendix present the bivariate relationship between SSS and health outcomes as well as the influence of main control variables on SSS and health. The results in Table A3 and Table A4 will be discussed in Chapter Five.

¹ Multicollinearity is a common concern when subjective social status is present with socioeconomic variables in a regression model. Variance inflation scores for the independent variables never exceeded 1.9 in any model. Therefore, multicollinearity does not appear to adversely affect the results.

Results

Table 3.1 displays the descriptive statistics for the sample in this study. Table 3.2 presents bivariate Pearson correlation for all tested variables in this study. Subjective social status (SSS) shows a significant and slightly stronger correlation with most of health outcome measures followed by education and family income. I find that SSS has the strongest correlation with self-reported overall life satisfaction.

Table 3.3 contains the results for multivariate regression models. Model 1 demonstrates prediction on self-reported overall quality of life. Consistent with past research on this topic, I find for those who perceive themselves higher in social position are more likely to report greater quality of life. While SSS and age have a significant and positive relationship with self-reported overall quality of life, male shows a significant negative relationship with self-reported overall quality of life. Model 2 looks at perceived control over health. Net of all controls, SSS has a significant positive relationship with perceived self-control over health. Home ownership also has a positive link whereas alcohol drinking has a negative link with perceived control over health. Model 3.2 examines prediction on self-rated health. Net of all socio-demographic variables, SSS has no significant association with self-rated health. Net of all socio-demographic variables, SSS has no significant association with self-rated health. Being currently employed and higher family income show a significant positive relationship with self-rated health whereas cigarette smoking and regular exercise show a significant negative relationship.

Table 3.1

The sociodemographic characteristics of the White non-Hispanic participants, Midlife in the United States at baseline (2005)

Variables	N	Mean	SD	Minimum	Maximum
Subjective social status	1726	6.51	1.85	1	10
Health Outcomes					
Self-rated health	2195	3.5	1.01	1	5
Self-rated mental health	2194	3.76	0.93	1	5
Self-rated health comparison to the same age group	2183	3.73	0.96	1	5
Overall life satisfaction	1740	7.84	1.54	0	10
Health satisfaction	1751	7.26	1.64	0	10
Control over health	1751	7.61	1.89	0	10
Depressive symptoms (log-transformed)	1760	1.86	1.37	0	4
ADL/IADL (difficulty=1)	1696	0.5	0.5	0	1
Chronic conditions (any=1)	1760	2.56	2.61	0	1
Prevalence bodily pain (any=1)	1760	0.22	0.42	0	1
Demographic Covariates					
Age	2190	56.03	12.71	34	84
Sex (Male=1)	2195	0.47	0.49	0	1
Married (=1)	2195	0.67	0.47	0	1
Education	2193	7.12	2.54	1	12
Family Income from past year	1676	5.52	2.84	1	10
House (owned=1)	2195	0.28	0.45	0	1
Currently employed (=1)	2195	0.63	0.48	0	1
Friendship support	1760	3.31	0.82	1	8
Number of household members besides children or self	2195	0.85	0.65	0	7
Health behavior covariates					
Smoking (current=2, past=1)	2195	0.68	0.73	0	2
Alcohol drinking (currently=1)	2195	0.18	0.38	0	1
Exercise regularly (=1)	2195	0.21	0.41	0	1

Table 3.3

Coefficients from the Ordinary Least Squares (OLS) of Overall Quality of Life, Perceived Control over Health, Self-rated Health, Current Health Quality, and Depressive Symptoms (log-transformed) on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables

Variables	Model 1 Overall Quality of Life	Model 2 Perceived Control over Health	Model 3 Self-rated health	Model 4 Current Health Quality	Model 5 Depressive Symptoms
Previous health outcome	.58*** (.456)	.48*** (.448)	.53*** (.451)	.54*** (.494)	.47*** (.455)
Subjective social status (SSS)	.09*** (.101)	.078* (.075)	.024 (.040)	.031 (.033)	.018 (.029)
Age	.015** (.106)	-.011 (-.065)	.004 (.038)	.003 (.024)	-.005*** (-.046)
Male (=1)	-.182* (-.055)	-.069 (-.017)	-.065 (-.027)	-.065 (-.019)	.039 (.005)
Education	-.002 (-.004)	.012 (.016)	.013 (.028)	.016 (.023)	-.008 (-.020)
Married(=1)	.106 (.037)	-.239 (-.057)	-.112 (-.030)	-.132 (-.038)	-.064 (-.025)
Employed (=1)	.188 (.054)	.17 (.043)	.166* (.072)	.353** (.100)	-.082 (-.038)
Family income	.084 (.062)	.081 (.089)	.049*** (.127)	.049* (.069)	.056 (-.047)
House (own=1)	.035 (.024)	.063*** (.019)	.08 (.035)	.08 (.034)	-.024 (.035)
Number of household member	-.04 (-.017)	-.009 (-.003)	-.058 (-.039)	-.001 (-.000)	.002 (-.013)
Friendship support	.037 (.019)	.058 (.026)	.043 (.031)	.004 (.001)	-.061 (-.048)
Cigarette smoking	.021 (.005)	-.065 (-.024)	-.107** (-.071)	-.113 (-.048)	.062 (.025)
Alcohol drinking	.029 (.007)	-.327* (-.068)	-.002 (.001)	-.132 (-.032)	.103* (.039)
Exercise (=1)	.021 (.005)	-.01 (-.002)	-.14* (-.057)	-.265* (-.066)	.064 (.010)
Intercept	2.09***	3.41***	0.61*	2.47***	1.37***
N	990	1021	1146	1023	1146
Adjusted R-square	0.32	0.26	0.32	0.32	0.23

Source: Midlife Development in the United States 2004-2014

* <.05 ** <.01 ***<.001

Standardized coefficients (**B**) (in brackets)

Model 4 focuses on the prediction over self-rated current quality of health. SSS shows no significant relationship with self-reported current health quality. In this model, current full-time employment and increases in family income show a significant positive relationship whereas regular exercise show a significant negative relationship. Lastly, Model 5 examines log-transformed, self-reported depressive symptoms. SSS fails to achieve a significant relationship. In this model, increases in age has a significantly negative effect, whereas alcohol consumption has a significantly positive relationship with higher number of depressive symptoms.

Table 3.4 displays the results from ordered logistic predicting self-rated mental/emotional health and health comparisons to other people in the same age as well as binary logistic regressions predicting prevalence of functional limitation (ADL/IADL), chronic conditions, and bodily pain. Model 1 shows after controlling all covariates, for those who perceive themselves as higher in social status are more likely to report better self-rated mental/ emotional health. Increase in education attainment and family income, being currently employed (1.43 times), and higher level of friend support also show greater odds whereas those who are smoking cigarettes and exercise regularly (about 35%) show lower odds on reporting better self-rated mental/emotional health.

Model 2 presents prediction on health comparison to other people in the same age group. SSS shows higher odds of reporting higher value on health comparison by 1.10 times. Increase in age and family income, current employment (1.33 times), and higher level of friendship support as well show greater likelihood whereas cigarette smoking show 24% less likelihood of scoring themselves higher on health comparison scale.

Model 3 focuses on prediction for the prevalence of any functional limitations

(ADL/IADL). SSS shows lower odds of reporting any ADL/IADL item, it does not show statistical significance. In Model 3, current full-time employment is about 33 percent less likely and mid- and old-aged men are about 34 percent less likely to report having any item on ADL/IADL. Next, Model 4 examines prevalence of any chronic condition. SSS fails to achieve any significance before or after controlling for other variables. In this model, only higher level of friend support (about 22%) shows significant lower odds of reporting prevalence of any chronic condition. Lastly, in Model 5, SSS shows no significant relationship with reporting any bodily pain. In this model, people who smoke (by 1.41 times) and regular exercise (by 1.65 times) are more likely to report having bodily pain.

Conclusion

The findings of this current study, extending from previous research on subjective social status (SSS), objective socioeconomic status (SES), and health linkage, provide additional evidence for a social gradient in health outcomes. Notably, my research is one of few to use a longitudinal and a nationally representative sample of mid and old-age, Non-Hispanic Whites in the United States. The analyses indicate that SSS has strong relationships mostly with subjective health measures: overall quality of life, perceived control over health, self-rated mental/ emotional health, and health comparison to other people in the same age group. My multivariate models demonstrate that as SSS increases, there is an associated increase in higher subjective evaluation of health statuses and conditions, controlling for a range of SES variables, basic demographic characteristics, and health behaviors. This finding is consistent with a previous study (Yu and Williams,

1999; Mirowsky and Ross, 2000; Rozanski et al., 2005; Ghaed and Gallo, 2007). On the other hand, there is no significant relationships found between SSS and most objective health status measures: self-rated health, depressive symptoms as well as prevalence of any functional limitation (ADL/IADL), chronic condition, and bodily pain.

In the multivariate analyses concerning the objective SES indicators, household income shows the most consistent predicting some of health outcomes: better self-rated health, health comparison to people in the same age group, and self-rated mental/emotional health. These findings are consistent with research that has demonstrated a graded relationship between SES and health (e.g., Gallo & Matthews, 2003; Rozanski et al., 2005). The results of educational attainment, which previous research describe as one of the most powerful predictors of health, show no significant relationships with almost all health outcomes, only except to self-rated mental/emotional health. One explanation is that economic status has a stronger influence particularly on late mid- and old-age adults' health than level of education. For the mid- and old-age adults, income compared to education, may be more likely to equate to access to resources. For example, income is likely to afford good medical care and more opportunities for restorative activities. Also, financial strains not only are a direct cause of stress, greater capacity to cope but also affect it indirectly by influencing nutrition, life-style, and dependence on others, especially on family members. (Adler and Ostrove, 1999). Based on the current findings and possible explanations for their reasons, future research should consider elaborating the objective SES indicators such as including occupational prestige and assets (e.g., vehicle, stocks and mutual funds, debt, etc.).

Table 3.4

Odds Ratios from Ordered Logistic Regression of Self-rated Mental/Emotional Health and Health Comparison to People in the Same Age, Binary Logistic Regression of Prevalence of Functional Disability (ADL/IADL), Chronic Condition, and Bodily Pain on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables

Variables	Model 1 Self-rated Mental Health	Model 2 Health Comparison	Model 3 Functional Limitation (ADL/IADL)	Model 4 Chronic Conditions	Model 5 Bodily Pain
Previous health outcome	2.43*** (.437)	3.055*** (.555)	6.359*** (.501)	3.711*** (.295)	5.17*** (.366)
Subjective social status (SSS)	1.078* (.074)	1.103** (.096)	0.929 (-.073)	0.964 (-.040)	1.07 (.063)
Age	1.008 (.047)	1.016* (.100)	1.033*** (.206)	0.998 (.004)	1.02 (.111)
Male (=1)	0.891 (-.031)	0.878 (-.035)	0.637** (-.128)	0.807 (-.062)	0.87 (-.039)
Education	1.051* (.070)	1.03 (.039)	0.999 (.003)	1.026 (.041)	0.9* (-.147)
Married(=1)	0.913 (-.022)	0.762 (-.072)	1.176 (.029)	0.886 (-.064)	1.03 (.006)
Employed (=1)	1.432* (.093)	1.328* (.071)	0.666* (-.101)	0.896 (-.020)	0.7 (-.093)
Family income	1.126*** (.162)	1.099*** (.144)	0.943 (-.090)	1.03 (.042)	0.93 (-.112)
House (own=1)	1.112 (.030)	1.092 (.025)	1.061 (.014)	1.1 (.023)	0.73 (-.080)
Number of household member	0.881 (-.046)	0.997 (.025)	1.09 (.027)	1.245 (.078)	1.07 (.024)
Friendship support	1.205* (.073)	1.175* (.064)	0.853 (-.062)	0.778* (-.083)	0.81 (-.081)
Cigarette smoking	0.832* (-.073)	0.764** (-.105)	1.174 (.061)	1.132 (.045)	1.41* (.136)
Alcohol drinking	0.926 (-.016)	0.933 (-.015)	1.018 (-.003)	1.136 (.021)	0.67 (-.088)
Exercise (=1)	0.629* (-.106)	0.832 (-.041)	1.211 (.049)	1.488 (.097)	1.65* (.115)
N	1146	964	964	1010	1146
Adjusted R-square	0.27	0.27	0.35	0.1	0.23

Source: Midlife Development in the United States 2004-2014

* <.05 ** <.01 ***<.001

Standardized coefficients (**B**) (in brackets)

Table 3.2

Bivariate Correlation for Key Variables, Midlife in the United States

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
2	.58																					
3	.61	.43																				
4	.31	.43	.30																			
5	.67	.43	.55	.38																		
6	.51	.33	.42	.31	.65																	
7	-.19	-.30	-.19	-.38	-.31	-.23																
8	-.42	-.30	-.33	-.14	-.40	-.30	.22															
9	-.18	-.15	-.17	-.10	-.14	-.05	.10	.19														
10	-.28	-.15	-.21	-.14	-.29	-.23	-.24	.27	.07													
11	.19	.23	.21	.32	.18	.15	-.11	-.09	-.06	-.04												
12	-.05	-.01	.10	.18	-.06	-.13	-.01	.29	.05	.13	.15											
13	.01	.05	.03	-.01	.01	-.00	-.03	-.14	-.04	-.06	.13	-.02										
14	.03	.06	-.04	.15	.01	-.04	-.05	-.06	-.01	-.05	.10	-.10	.17									
15	.25	.23	.17	.06	.18	.12	-.06	-.16	-.02	-.18	.17	-.13	.10	.05								
16	.25	.25	.13	.15	.17	.14	-.11	-.22	-.03	-.15	.14	-.36	.16	.40	.36							
17	.00	.00	.04	.12	.01	-.05	.04	.13	.02	.02	.09	.41	.00	.04	-.06	-.22						
18	.20	.15	.10	.02	.22	.18	-.09	-.27	-.04	-.18	.03	-.51	.12	.07	.20	.38	-.25					
19	.11	.15	.13	.19	.08	.07	-.10	-.07	-.04	-.05	.24	.06	-.13	-.01	.02	.04	-.00	-.02				
20	-.02	-.02	-.05	.02	-.00	-.01	-.02	-.04	.02	-.03	.03	-.13	.11	.54	.01	.25	-.01	.07	.04			
21	-.17	-.14	-.17	-.12	-.11	-.08	.06	.10	.04	.09	-.08	-.01	.05	-.06	-.18	-.09	-.04	-.02	-.02	-.00		
22	.08	.04	.05	.03	.03	-.02	.00	-.05	.00	-.07	.04	.02	.18	.04	.12	.12	.00	.02	.01	.02	.08	
23	-.16	-.13	-.12	-.02	-.15	-.08	.04	.17	.05	.15	-.05	.21	-.09	-.04	-.19	-.19	.15	-.16	-.05	-.02	.03	-.07

1. Self-rated health 2. Self-rated mental health 3. Self-rated health comparison to the same age group 4. Overall life satisfaction 5. Health satisfaction 6. Control over health 7. Depressive symptoms (log-transformed) 8. ADL/IADL (difficulty=1) 9. Chronic conditions (any=1) 10. Prevalence bodily pain (any=1) 11. Subjective social status (SSS) 12. Age 13. Sex (Male=1) 14. Married (=1) 15. Education (1-4) 16. Family Income from past year 17. House (owned=1) 18. Currently employed (=1) 19. Friendship support 20. Number of household members besides children or self 21. Cigarette smoking 22. Alcohol drinking 23. Exercise

While the overall analyses in this paper fill some gaps in the research, further research is needed to fully understand how SSS influences health outcomes. First, as with any secondary data analysis, the study relies extensively on self-report measures. Also, several biological risk factors such as childhood health status, family history, and biomarkers could not be analyzed in this study. Since these factors are strong predictors on health outcomes such as questions regarding chronic or physiological conditions, future studies should include clinical measures such as medical and family history. Second, although this study use a panel of longitudinal data to assess the relationship between SSS and psychological and physical health outcomes, some of significant associations found between SSS and one's perceived health conditions do not uncover a causal relationship. Thus, utilizing longitudinal data with multiple time series, would advance our understanding of the pathway between SSS and health.

Third, one of the important predictors of health refers to the quality of neighborhood environment and one's attachment to the community, which are not found in the dataset is a potential area for future research. Individuals who reside in deteriorating neighborhoods tend to be at greater risk for poor health. For example, several studies have shown that premature mortality, morbidity and unhealthy lifestyle behavior increases for residents of deprived neighborhoods (Duncan et al., 1998; Wilkinson, 1999; Pickett and Pearl, 2001; and Van Lenthe et al., 2005). The neighborhood measure therefore may enhance our knowledge on the underlying linkage between SSS and health. Also, because this whole dissertation aims to compare homogeneous people groups for cross-national analysis, this current study only include Non-Hispanic White respondents. However, since different racial and ethnic groups is

one of the profound predictors of health disparities in the United States, future study need to include different racial and ethnic minority groups to assess the linkage between SSS and health.

Lastly, another important consideration for future study is to regard the use of SSS ladder measures as a single perceived social status measure. Although this approach has been increasingly popular and recommended by researchers, there are additional factors distinct from the objective SES and community SSS measure should be taken into account when reporting perceived social status. For instance, in a qualitative analysis of individuals' criteria for defining "community," Adler and Stewart (2007) reported that participants ranked themselves based on their neighborhood, city/town, religious group, social supporter, workplace, family, friends, and people with shared interests, region, and nation/world. Thus, future research should explore other likely predictors of subjective social status.

Regardless of some limitations, this study primarily indicates that there are some poor health statuses significantly associated with low SSS, underscoring the significance of one's relative position in socioeconomic health disparities literature. The continued growth of the ageing population in the United States will have a significant impact on health care utilization and health care costs. Therefore, ongoing research on health predictors as well as monitoring health inequality trends can better inform social and health policy as well as better assist health providers in prescribing the appropriate interventions.

CHAPTER FOUR

A Comparison between Adult Population of Metropolitan Areas in Seoul, South Korea and Tokyo, Japan on Subjective Social Status and Health linkage

Introduction

Socioeconomic status (SES) is one of the most powerful and consistent predictors of health (Williams, 1999; Mirowsky et al., 2000). Through decades of research, our theoretical and empirical knowledge on the association between SES and health has greatly improved by the persistent and pervasive evidence of the socioeconomic gradient in physical and mental health (Williams, 1990; Adler et al., 1994; Krause, Borawski-Clark, 1995; Ostrove et al., 1999).

While the bulk of the research focus on the health effects of objective SES indicators such as income and education, relatively little is known about the impact of subjective perceptions of SES. Evidence shows that the ubiquitous nature of social hierarchies have a strong influence on physiology and health in primates (Sapolsky, 2005). However, a group or society must generally agree about the relative position of other members (Marshall, 1977). Conventional understanding then suggests that there must be ways to communicate where an individual is along the social hierarchy since one's social status is determined by the collective judgment of a group. Low social status groups are negatively labeled and stigmatized. They are often associated with a disadvantaged position in society (Major and O'Brien, 2005). As a result, people are affected by their own biological predisposition to care about status and the social importance of relative position, which influences individuals to seek a higher social status

(Marmot, 2005). However, the resources needed to climb the social ranks are limited and are often determined by early life advantages (Merton, 1968; Forsen et al., 1999).

Additionally, individuals are not universally satisfied with a particular social status they achieve relative to others. The cumulative effects of these factors lead to social status gradients.

Subjective social status refers to “a person’s belief about his location in a status order” (Davis, 1956), namely, one’s self-perception of the individual’s socioeconomic status in comparison to others. One key element in an individual’s self-perceived social position is that it is usually “relative” to other members in society or any reference groups (Singh-Manoux et al., 2003). Currently, findings and understanding of the interrelationships between objective SES, SSS, and health are mostly taken from Western data. Previous literature has shown a strong correlation between SSS and three traditional measures of SES; educational attainment, household or personal income, and occupation. These worldwide findings confirm that increases in education and income are associated with better health (Ostrove et al., 2000; Operario et al., 2004; Wright and Steptoe, 2005; Dunn et al., 2006; Ghaed and Gallo, 2007; Cohen et al., 2008; Demakakos et al., 2008; Wolff et al., 2010; Cundiff et al., 2013). Over recent decades, health research in the US and other Western countries find similar results on the linkage between SSS and health (Adler et al., 2000; Ostrove et al., 2000; Singh-Manoux et al., 2005; Demakakos et al., 2008).

The SSS scale distinguishes itself from conventional measures of SES, acknowledging that perceived status is both a socioeconomic and cultural product (Franzini and Fernandez-Esquer 2006). Embedded in these contexts, multi-dimensional

factors including employment status, neighborhood socioeconomic status, and demographic characteristics may surface as important determinants of subjective status (Jackman 1979). Objective measures often overshadow other achieved and ascribed statuses that may play a significant role in determining social position, such as marital status, race/ethnicity, and role in the community. Consequently, the concept of subjectivity may give further significance to the objective measure of SES because of the social interpretation perceived by the individual, regardless of the proposed value in society. This notion is similar to that in the self-rated health literature which suggests that the importance of self-perception exceeds that from measured phenomena (Benyamin and Idler, 1999). Due to all of these factors and the purpose of this dissertation, I believe that the use of SSS is the best measure predicting mental and physical health outcomes.

Despite the growing data collection of SSS and increasing evidence, there is still very little research that has examined the relationship between SSS and the health of Asian populations. Previous research done in Asia has typically focused on objective SES, primarily education and income, and neglected subjective or self-perceived social status. Therefore, our understanding about the relationship between the objective SES, SSS, and health in the different cultural and societal context is still limited. Therefore this chapter attempts to assess a cross-national health comparison on the association of SES, SSS, and health in East Asian countries, specifically, between South Korea and Japan.

The cross-national health comparison between these countries is potentially significant as Japan and Korea are neighboring countries and share similar social contexts, as well as demographic transitions which caused rapid population aging (Goodman and Peng, 1996; Kim and Maeda 2001). Japan colonized Korea for 36 years in

the early 20th century, and Japan has five heavily influenced Korea in contemporary history (Kim et al., 2011). The two countries have similar industrial structures, education systems, and judicial and political institutions (Goodman and Peng, 1996). Both countries have experienced rapid socioeconomic development, industrialization, and urbanization (Kim and Maeda, 2001), and the dramatic social changes have caused drastic demographic transitions in both countries, such as decreases in fertility and mortality in a short period. Both countries have also experienced the aging of their populations at a faster rate than in any Western countries (Kim and Maeda, 2001).

In addition, East Asian countries are largely racially homogenous compared to Western countries. For example, in the United States, race and ethnicity is one of the key demographic factors associated with health. On the other hand, the vast majority of people in East Asian countries are of one race or ethnicity. For example, over 95% of the population in Japan and South Korea are defined as 'Japanese' or 'Korean'. This homogeneous national identity/ culture is a major difference between Western and Eastern settings when investigating the effects of socioeconomic, including demographic factors on one's health outcome because of the greater ethnic and cultural diversity of western countries. Therefore these differences in social structural setting are likely to result in different health statuses between Western and Eastern countries. For that reason, investigating the relationship between social and cultural environment and health leads to a notable contribution to the current cross-national health literature.

This research is unique in several ways. While several studies have previously attempted to understand the effects of socioeconomic factors on health outcomes in Japan and South Korea, most of them focus on each country in isolation (Kwon et al., 2009;

Tsuchiya et al., 2009; Odagiri, Uchida, and Nakano, 2011), and a comparative study between the two countries has not yet been carried out. Also, this research is the first to examine the interrelationship of SES, SSS, and mental and physical health between South Korea and Japan. This chapter therefore aims to understand the relationship of the objective SES indicators, SSS and a wide range of health outcomes of mid- and old-age population in each country's major metropolitan cities: Tokyo, Japan and Seoul, South Korea.

Data

Data for Japanese sample are taken from the first (2008) and the second (2012) waves of the Survey of Midlife Development in Japan (MIDJA). The survey is a probability sample of Japanese adults (N=1,027) aged 30-79 from the Tokyo metropolitan area, funded by the National Institute of Aging (NIA). The overall response rate was 56.2 percent. A longitudinal follow-up of the MIDJA sample was conducted (N=657) which largely repeated the baseline assessments. The response rate for the follow-up was 73.7 percent of living longitudinal participant. All respondents were sent an invitation letter to complete a self-administered questionnaire (SAQ). The main objective was to compare the Japanese sample (MIDJA) with the United States sample (MIDUS) to test hypotheses about the role of psychosocial factors in the health and in predicting health changes of mid- and later-life adults in Japan and the United States. The MIDJA data are available at Institute for Social Research (www.icpsr.umich.edu). A list of personal characteristics used in these analyses can be found in Table 4.1a along with minimum and maximum values for each.

Data for the South Korean sample come from the second (2008) and the fifth (2014) waves of the Korean Longitudinal Study of Ageing (KLoSA). While the first wave of KLoSA was collected in 2006, the question on subjective social Status (SSS) only began asking at the second wave (2008). The analysis in this project therefore focuses on the period in which the KLoSA asked respondents about subjective social status, from 2008-2014. Because the Japanese sample only included those who resided in the Tokyo metropolitan area, I have restricted the South Korean sample to individuals that resided in the Seoul metropolitan area (N=1,372). The KLoSA data are available at Employment Survey and Analysis (survey.keis.or.kr). All multivariate analyses have been adjusted by base-year weighting. A list of personal characteristics used in these analyses can be found in Table 4.1b along with minimum and maximum values for each.

Dependent Variables

The following seven dependent variables were used for the Japanese sample to examine the relationship between SSS and health: self-reported overall life satisfaction, health satisfaction, perceived control over health, depressive symptoms, functional limitations (ADL/IADL), chronic conditions, and bodily pain. The self-reported overall life and health satisfaction were measured. For overall life satisfaction, the question asks, “Using a scale from 0 to 10 where 0 means ‘the worse possible life overall’ and 10 means ‘the best possible life overall’ how would you rate your life overall these days?” For health satisfaction, the question asks, “Using a scale from 0 to 10 where 0 means ‘the worse possible health’ and 10 means ‘the best possible health’ how would you rate your health these days?” The question for perception of one’s control over health asks, “Using a scale from 0 to 10 where 0 means ‘no control at all’ and 10 means ‘very much control’

how would you rate the amount of control you have over health these days?” Higher score indicates better health outcome. The depressive symptoms variable was measured based on six items. The questions ask, “During the past 30 days, how much of the time did you feel: so sad nothing could cheer you up? Nervous? Restless or fidgety? Hopeless? That everything was an effort? Worthless?” Possible answers were 1= all of the time, 2= most of the time, 3= some of the time, 4= a little of the time, and 5= none of the time. Scales were constructed by calculating the mean across each set of items. Items were recoded so that higher scores reflected higher levels of negative affect. The alpha reliability coefficient for the index was 0.85.

Next, self-reported functional limitation (ADL/IADL) was assessed with a measure of Instrumental Activities of Daily Living (IADL)/ Activities of Daily Living (ADL) disability. A summation of three ADLs (bathing, climbing stairs, and walking a block) and six IADL tasks (lifting groceries, bending, walking more than a mile, walking several blocks, vigorous activities, and moderate activities) was recoded as binary (1= any difficulty). Next, self-reported having any chronic condition was used by taking the total number of “yes” responses to have experienced in the past 12 months. A summation of 30 items was recoded as binary (1=any chronic condition). Lastly self-reported bodily pain was used with a question “During the past 30 days have you taken prescription medicine for any of the following conditions, PAIN?” The measure was coded as binary (1= yes).

The next following eight dependent variables were used for the Korean sample to examine the relationship between SSS and health: self-rated health, overall quality of life, perceived health quality, depressive symptoms, and prevalence of self-reported functional

limitations (ADL/IADL), chronic conditions, bodily pain, and cognitive functioning (MMSE). The self-reported overall life and health satisfaction were measured.

First on self-rated health, respondents were asked to rate their health on a five-point scale from excellent (1) to poor (5) which were reverse coded so that higher score indicates better health. Next, self-reported overall quality of life was measured with a question, “Compared to people of your age, how would you rate your overall quality of life?” and recorded each respondent’s current overall state on a vertical, visual analogue scale ranging from “best imaginable overall state” (100) to “worst imaginable overall state” (0). The perceived health quality was asked, “Compared to people of your age, how would you rate your current health satisfaction?” and recorded each respondent’s current overall state on a vertical, visual analogue scale ranging from “best imaginable overall state” (100) to “worst imaginable overall state” (0). Lastly, the short-form Center for Epidemiological studies of Depression (CES-D10) scale was used to assess the respondent’s depressive symptoms during the most recent week. The negatively phrased eight items (loss of interest, trouble concentrating, feeling depressed, feeling tired or low in energy, feeling afraid, trouble falling asleep, feeling alone, and hard to get going), and two positively phrased items, which were reverse coded (feel very good, generally satisfied) ranged from 0 to 3: Very rarely or less than once a day; Sometimes or 1-2 days during the past week; Often or 3-4 days during the past week; Almost always or 5-7 days during the past week. All ten items were summed and higher number indicates more depressive symptoms for the respondent. The alpha reliability coefficient for the index is 0.83.

The second focuses on the prevalence of various physical health outcomes. First, self-reported functional limitations (ADL/IADL) was assessed with a measure with the Korean version of the Instrumental Activities of Daily Living (IADL)/ Activities of Daily Living (ADL) disability on the same underlying continuous dimension. A summation of seven ADLs (eating, dressing, transferring, toileting, and bathing) and ten IADL items (preparing meals, using the telephone, cleaning one's room, shopping, using transportation, walking outside with or without walking aids, and using stairs) was recoded as binary (1= need any help). The alpha reliability coefficient for the index was 0.94. Next, the measure of cognitive functioning was assessed with the Korean version of the Mini-Mental State Examination (K-MMSE) which is a widely used screening tool for cognitive impairment and dementia diagnosis. A total of 19 items were scored with a maximum of 30 points. Based on the K-MMSE score, cognitive impairment was defined as scoring 17 points or less and recoded as binary (1= impaired). The alpha reliability coefficient for the index was 0.88. The physician-diagnosed eight chronic conditions (hypertension, diabetes, cancer, lung disease, cardiovascular, liver disease, cerebrovascular disease, and arthritis) since the second wave (2008) were used. The items were summed and coded as binary (1=having any diagnosis). Lastly, the self-reported any bodily pain was asked if the person currently has any pain in the body and recoded as binary (1= any bodily pain).

Independent Variables of Interest

The independent variable of interest is a linear operationalization of subjective social status. The question was asked with a picture of a ladder, "Think of this ladder as representing where people stand in their communities. People define community in

different ways; please define it in whatever way is most meaningful to you. At the top of the ladder (coded 10) are the people who have the highest standing in their community. At the bottom (coded 1) are the people who have the lowest standing in their community. Where would you place yourself on this ladder?" The possible answers were reverse coded to indicate higher score better standing in their community.

The question of KLoSA on subjective social status asked respondents to assess their socioeconomic status and rank themselves. Possible responses were "Lower Lower Class," "Upper Lower Class," "Lower Middle Class," "Upper Middle Class," "Lower Upper Class," and "Upper Upper Class." Higher values correspond to higher subjective social class (1=Lower Lower Class to 6= Upper Upper Class).

Control Variables

A number of control variables at baseline are included in the analyses. Demographic variables are age (in years), gender (1=male), marital status (1= married), home ownership (1=owned), employment (1= currently employed), and number of household member (numbers). All demographic variables are measured the same for both South Korean and Japanese sample except household income and education. For MIDJA, because household income measure is not available, I used a question which asks whether the respondent and his/ her family currently have funds perceived to be adequate (1= yes). Household income for South Korean sample is recoded (1=\$3,500 or less to 10=\$55,000 or more). Education in MIDJA was measured in eight categories (1= 8th grade junior high school graduate or lower to 8= graduate school) whereas education in the KLoSA was measured in four categories (1= elementary school or lower to 4= college degree or higher).

In MIDJA, friend support is measured using the four questions: “how much do your friends really care about you?” “How much do they understand the way you feel about things?” “How much can you rely on them for help if you have a serious problem?” and “How much can you open up to them if you need to talk about your worries?” Possible responses are 1=A lot, 2=Some, 3=A little, and 4=Not at all. Scales are constructed by calculating the mean of the values of the items in each scale. Items were reverse-coded so that high scores reflect greater friend support. The alpha reliability coefficient for the index was 0.83. In the KLoSA, a question was asked “How often do you see your close friends?” Responses were coded into four categories (1= almost none to 4= more than once a week). Cigarette smoking (2=current, 1=past, 0=never), alcohol drinking (1= current), and exercise (1=yes) were used for health-related behaviors. Each exhibited a significant association with various health outcomes among the mid-and-later life adults in past research.

Methodology

I begin by presenting descriptive statistics for all of the variables from MIDJA and the KLoSA which were used in this project. I then provide a bivariate correlation for all tested variables in this study. Next, I move to multivariate analysis of these relationships.¹ Any cases where the response for the dependent was missing was dropped from the model. The first set of multivariate analysis is done by performing Ordinary Least Square (OLS) regression to investigate the association between subjective social

¹ Multicollinearity is a common concern when subjective social status is present with socioeconomic variables in a regression model. Variance inflation scores for the independent variables never exceeded 1.9 in any model. Therefore, multicollinearity does not appear to adversely affect the results.

status and self-reported overall life satisfaction, perceived control over health, self-rated health, and before and after including social support and health-related behavior measures, current health quality, and depressive symptoms. Due to unequal proportion within self-rated health measure in the KLoSA, Ordered Logistic Regression was performed. Lastly, to describe the effects of subjective social status on the prevalence of functional limitations (ADL/IADL), chronic condition, and bodily pain for both sample, I estimate logistic regression models predicting the likelihood of having the condition.

For the South Korean sample, the cognitive functioning (MMSE) measure is added in the binary logistic regression models. All models are adjusted by control variables, including health results of the baseline survey data both MIDJA and KLoSA. The results from the OLS and Logistic regressions are reported below and each MIDJA and KLoSA sample is presented in a separate table. In addition, Table A5 and Table A6 in Appendix present the bivariate relationship between SSS and health outcomes as well as the influence of main control variables on SSS and health. The results in Table A5 and Table A6 will be discussed for a cross-national analysis in Chapter Five.

Results

Table 4.1 and 4.2 show the descriptive statics for the sample of Tokyo (1.1) and Seoul (1.2). The average age of the respondents is higher for Seoul (64) than Tokyo (54). Tokyo has a slightly higher percentage of male respondents (49%) than Seoul (42%) and a larger percentage who are currently employed full-time (72%) compared to respondents in Seoul (35.8%). 68.1 percent of sample in Seoul has home ownership whereas 45 percent of the sample in Tokyo are home owners.

Table 4.3 and 4.4 presents bivariate Pearson correlation for all tested variables in MIDJA and the KLoSA. Table 4.3a shows that for the sample in Tokyo, subjective social status shows the strongest correlation with self-reported overall quality of life and depressive symptoms compared to other bivariate relationship between control and dependent variables. Age shows the strongest correlation with prevalence of physical limitation (ADL/IADL), chronic condition, and bodily pain measures. In Table 4.4, the sample in Seoul shows that subjective social status has the strongest correlation with self-reported overall life satisfaction compared to other bivariate relationships between control and outcome variables. Age, marital status, education, family income, employed, and friend support also show moderate correlations with dependent variables.

Table 4.5 (Tokyo, Japan) and 4.6 (Seoul, South Korea) contain the results for multivariate regression models. Model 1 in Table 4.5, for mid and old-aged adults in Tokyo, Japan shows that subjective social status (SSS) has a significant positive relationship with self-reported overall life satisfaction after controlling covariates. Being male and the presence of financial hardship have a significant negative relationship with overall life satisfaction. Model 2 assesses prediction on perceived control over health. Net of all controls, SSS has a significant association with greater personal control over health. Regular exercise also shows a significant positive link with perceived control over health. Next, model 3 examines self-reported current health quality. SSS fails to achieve any significance before and after including control variables. In this model, only regular exercise shows a significant positive relationship on current health policy. Lastly, model 4 focuses on predicting depressive symptoms. Net of all controls, SSS shows a significant

negative relationship with depressive symptoms. Being male and regular exercise also show significant negative association with reporting higher depressive symptom score.

Table 4.6 shows that for mid- and old-aged adults in Seoul, South Korea, subjective social Status (SSS) and self-reported overall life satisfaction (model 1) have a strongly significant and positive relationship. Age and educational attainment also shows significant links with greater overall life satisfaction. Model 2 assesses prediction on self-reported current health satisfaction. SSS shows a significant positive association with self-reported current health satisfaction. While education has a significant positive association, age and alcohol drinking show a significant negative association with self-reported current health satisfaction. Finally, model 3 shows a significant negative association between SSS and self-reported depressive symptoms (CES-D10). Age and cigarette smoking have a significant positive relationship whereas higher educational attainment and being married show significant negative relationships with self-reported depressive symptoms.

Table 4.7 (Tokyo, Japan) and 4.8 (Seoul, South Korea) display ordered and binary logistic regression models. In Table 4.7, model 1, 2, and 3 show that for mid- and old-aged adults in Tokyo, Japan, subjective social status (SSS) has no statistically significant associations predicting prevalence of functional limitation (ADL/IADL), chronic condition, and bodily pain. Increase in age has higher likelihood of having any functional limitation (model 1) and bodily pain (model 3).

Table 4.1

The sociodemographic characteristics of the participants, Midlife in Japan at baseline (2008)

Variable	N	Mean	SD	Minimum	Maximum
Subjective social status	989	6.03	2.11	1	10
Health Outcomes					
Overall life satisfaction	1027	6.13	2.06	0	10
Current health quality	1027	6.22	1.97	0	10
Control over health	1027	5.95	2.23	0	10
Depressive symptoms	995	2.68	2.12	0	6
ADL/IADL (difficulty=1)	980	0.32	0.46	0	1
Chronic condition (any disease=1)	1012	0.16	0.36	0	1
Bodily pain (any=1)	976	0.11	0.31	0	1
Demographic Covariates					
Age	1027	54.36	14.14	30	79
Sex (Male=1)	1027	0.49	0.5	0	1
Married (=1)	1027	0.69	0.46	0	1
Education	1015	4.47	2.08	1	8
Family financial hardship (yes=1)	1027	0.15	0.36	0	1
House (owned=1)	1027	0.45	0.49	0	1
Currently employed (=1)	1024	0.72	0.45	0	1
Friendship support	1018	2.05	0.83	1	3
Number of people living in a household	1022	3.49	1.27	1	5
Health behavior covariates					
Smoking (current=1)	1027	0.26	0.44	0	1
Alcohol (current=1)	1027	0.39	0.49	0	1
Exercise regularly (yes=1)	1027	0.32	0.46	0	1

Table 4.2

*The sociodemographic characteristics of the participants residing in Seoul, Korean
Longitudinal Study of Ageing at baseline (2008)*

Variable	N	Mean	SD	Minimum	Maximum
Subjective social status	1371	2.490	1.086	1	6
Health Outcomes					
Self-rated health (1-5)	1371	2.839	1.01	1	5
CES-D10	1360	3.676	2.916	0	10
Overall life satisfaction	1371	55.463	18.675	0	100
Current health satisfaction	1372	51.538	20.735	0	100
IADL/ADL (difficulty=1)	1372	0.144	0.352	0	1
K-MMSE (any symptom=1)	1321	0.235	0.424	0	1
Chronic disease (any=1)	1372	0.067	0.250	0	1
Prevalence bodily pain (any=1)	1372	0.539	0.499	0	1
Demographic Covariates					
Age	1372	64.039	11.091	47	95
Sex (Male=1)	1372	0.423	0.494	0	1
Married (=1)	1372	0.75	0.433	0	1
Education	1372	2.252	1.082	1	4
Family Income from past year	1308	5.075	2.830	1	10
House (owned=1)	1372	0.681	0.466	0	1
Currently employed (=1)	1372	0.358	0.480	0	1
Friendship contact	1372	1.990	1.065	0	3
Number of people living in a household	1155	3.099	1.388	1	7
Health behavior covariates					
Smoking (current=2, past=1)	1372	0.470	0.771	0	2
Alcohol (current=2, past=1)	1372	1.161	0.936	0	2
Exercise regularly (=1)	1372	0.374	0.484	0	1

Table 4.5

Coefficients from the Ordinary Least Squares (OLS) Regression of Overall Life Satisfaction, Perceived Control over Health, Current Health Quality, and Depressive Symptoms on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables, MIDJA (JAPAN)

Variable	Model 1 Overall Life Satisfaction	Model 2 Perceived Control over Health	Model 3 Current Health Quality	Model 4 Depressive Symptoms
Previous health outcome	0.494*** (.473)	0.392*** (.397)	0.507*** (.473)	0.486*** (.479)
Subjective social status (SSS)	0.102** (.007)	0.110** (.104)	0.015 (.007)	-0.074* (-0.068)
Age	0 (-.059)	0.009 (.054)	-0.009 (-.059)	0 (-.00)
Male (=1)	-0.313* (-.033)	-0.048 (-.011)	-0.174 (-.033)	-0.467** (-.122)
Education	0.001 (.047)	0.034 (.032)	0.059 (.047)	0.001 (.003)
Married(=1)	0.06 (.013)	-0.298 (-.061)	0.102 (.013)	-0.143 (-.030)
Employed (=1)	-0.069 (.020)	0.081 (.016)	-0.118 (.020)	0.143 (.030)
House (own=1)	0.047 (-.002)	-0.084 (-.019)	-0.044 (-.002)	0.189 (.041)
Financial hardship (yes=1)	-0.01** (-.055)	-0.174 (-.027)	-0.356 (-.055)	0.437 (.066)
Number of people in the household	-0.562 (.033)	0.112 (.065)	0.045 (.033)	0.071 (.042)
Friendship support	-0.001 (.091)	-0.003 (-.001)	0.159 (.091)	0.032 (-.031)
Cigarette smoking	-0.088 (-.059)	-0.109 (-.021)	-0.272 (-.059)	0.224 (.045)
Alcohol drinking	-0.063 (-.014)	-0.157 (-.035)	-0.052 (-.014)	-0.003 (.001)
Exercise (=1)	0.206 (.081)	0.405* (.088)	0.338* (.081)	-0.41* (-.09)
Intercept	2.894***	2.363***	2.854***	1.783**
N	625	630	628	595
Adjusted R-square	0.34	0.21	0.29	0.28

Source: Midlife Development in Japan 2008-2012

* p<.05; ** p<.01; ***p<.001

Standardized coefficients (**B**) (in brackets)

Table 4.6

Coefficients from the Ordinary Least Squares (OLS) Regression of Overall Life Satisfaction, Perceived Current Health Quality, and Depressive Symptoms (CES-D10) on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables, KLoSA (Seoul, South Korea)

	Model 1	Model 2	Model 3
Variable	Overall Life Satisfaction	Current Health satisfaction	Depressive Symptoms (CES-D10)
Previous health outcome	0.343*** (.336)	0.275*** (.285)	0.308*** (.289)
Subjective social Status (SSS)	4.399*** (.259)	3.265*** (.187)	-0.243* (-0.091)
Age	-0.16* (-.087)	-0.572*** (-.259)	0.043** (.129)
Male (=1)	-1.433 (-.040)	-0.312 (.014)	-0.155 (-.027)
Education	1.330* (.071)	1.426* (.053)	-0.245 (-.087)
Married(=1)	1.838 (.054)	0.238 (.017)	-0.884*** (-.115)
Employed (=1)	0.345 (.002)	0.966 (.018)	-0.119 (-.020)
House (own=1)	0.676 (.021)	-2.034 (-.025)	-0.034 (-.005)
Family income	-0.206 (-.013)	0.061 (.007)	-0.021 (-.021)
Number of people in the household	0.128 (-.004)	-0.213 (-.018)	-0.002 (.014)
Friendship contact	0.851 (.053)	0.348 (.008)	-0.044 (.016)
Cigarette smoking	-0.163 (-.013)	-0.769 (-.038)	0.248* (.092)
Alcohol drinking	-0.158 (-.004)	-1.98** (-.081)	0.081 (.039)
Exercise (=1)	2.285* (.062)	1.415 (.012)	-0.325 (-.048)
Intercept	27.509***	65.285***	2.159*
N	930	930	922
Adjusted R-square	0.41	0.35	0.26

Source: Korean Longitudinal Study of Ageing 2008-2014

All values weighted, * <.05; ** <.01; ***<.001

Standardized coefficients (**B**) (in brackets)

Table 4.7

Odds Ratios from Binary Logistic Regression of Prevalence of Functional Disability (ADL/IADL), Chronic Condition, and Bodily Pain on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables, MIDJA (JAPAN)

Variable	Model 1 Functional Limitation (ADL/IADL)	Model 2 Chronic Condition	Model 3 Bodily Pain
Previous health outcome	6.13*** (.441)	6.937*** (.396)	3.03 (.187)
Subjective social status (SSS)	0.943 (-.066)	1.105 (.097)	0.98 (-.029)
Age	1.07*** (.513)	0.988 (-.083)	1.03** (.238)
Male (=1)	0.906 (-.027)	1.265 (.064)	0.44* (- .223)
Education	1.018 (.020)	0.967 (-.019)	0.96 (-.052)
Married(=1)	0.748 (-.072)	0.45** (-.185)	0.9 (-.026)
Employed (=1)	1.026 (.006)	0.817 (.059)	1.35 (.071)
House (own=1)	0.726 (-.088)	0.977 (-.016)	0.95 (-.012)
Financial hardship (yes=1)	1.23 (.039)	1.094 (.012)	0.94 (-.011)
Number of people in the household	1.031 (.021)	1.128 (.080)	0.88 (-.086)
Friendship support	0.74 (-.099)	0.862 (-.034)	0.75 (-.099)
Cigarette smoking	1.044 (.010)	0.833 (-.040)	1.35** (.205)
Alcohol drinking	0.95 (-.013)	1.044 (.006)	2.37 (.079)
Exercise (=1)	0.58* (-.144)	1.161 (.030)	0.77 (-.070)
N	565	621	569
Adjusted R-square	0.39	0.19	0.13

Source: Midlife Development in Japan 2008-2012

* p<.05; ** p<.01; ***p<.001

Standardized coefficients (**B**) (in brackets)

Table 4.8

Odds Ratios from Ordered Logistic Regression of Self-Rated Health and Binary Logistic Regression of Prevalence of Functional Disability (ADL/IADL), Chronic Disease, Bodily Pain, and Cognitive Disability Symptoms (MMSE) on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables, KLoSA (Seoul, South Korea)

Variable	Model 1 Self-rated Health	Model 2 Functional Limitation (ADL/IADL)	Model 3 Chronic Disease Diagnosis	Model 4 Bodily Pain	Model 5 Cognitive Functioning (MMSE)
Previous health outcome	3.05*** (.496)	10.97*** (.394)	1.39* (.049)	3.15*** (.302)	3.96*** (.291)
Subjective social Status (SSS)	1.103* (.084)	0.65* (-.351)	0.98 (-.061)	0.94 (-.053)	1.09 (.044)
Age	1.02*** (-.181)	1.12*** (.604)	0.96 (-.100)	1.06*** (.329)	1.11*** (.513)
Male (=1)	0.878 (-.023)	1.68 (.097)	2.11 (.141)	0.28*** (-.366)	0.58 (-.117)
Education	1.03* (.123)	0.62** (-.257)	1.07 (.124)	0.84 (-.107)	0.61*** (-.374)
Married(=1)	0.762 (.018)	0.94 (-.022)	0.83 (.022)	0.68 (-.062)	0.89 (-.025)
Employed (=1)	1.328 (.047)	0.98 (.012)	0.82 (-.021)	0.92 (-.022)	0.81 (-.030)
House (own=1)	1.099 (.094)	1.31 (.091)	1.56 (.095)	1.03 (.021)	0.88 (-.037)
Family income	1.092 (.064)	1.21** (.311)	0.96 (-.019)	0.98 (-.007)	1.06 (.111)
Number of people in the household	0.997 (-.008)	0.9 (-.011)	1.08 (.130)	0.93 (-.063)	0.95 (-.065)
Friendship contact	1.175 (.018)	0.87 (-.077)	1.33 (.064)	0.94 (-.028)	1 (.008)
Cigarette smoking	0.764 (-.039)	1.19 (.126)	1.01 (-.109)	0.99 (.002)	1.31 (.083)
Alcohol drinking	0.933 (.027)	1.92** (.367)	0.96 (-.136)	1.06 (.021)	1.1 (.021)
Exercise (=1)	0.832 (.020)	0.98 (.038)	1.62 (-.024)	0.97 (-.012)	0.62* (-.123)
N	990	930	1103	930	1103
Adjusted R-square	0.32	0.42	0.07	0.29	0.47

Source: Korean Longitudinal Study of Ageing 2008-2014

All values weighted, * <.05; ** <.01; ***<.001

Standardized coefficients (**B**) (in brackets)

Model 1 shows that those who regularly exercise have 42% lower odds to report having any functional limitation (ADL/IADL). Those who smoke cigarette have odds 1.35 times greater to report having bodily pain (model 3). Only marital status shows a significant association on predicting a prevalence of any chronic condition (model 2); those who are married have 55% lower odds to report having any chronic condition.

The results for mid- and old-aged adult respondents in Seoul, South Korea are shown in Table 4.8. Model 1 presents ordered logistic on self-rated health. I find that those who perceive themselves higher in social status are more likely to rate higher on self-evaluated health. Models 2 to 5 present binary logistic regression on functional limitation (ADL/IADL), chronic disease diagnosis, bodily pain, and cognitive functioning (MMSE). Those who rank themselves higher in social status have 35% lower odds to report having any functional limitation (model 2). In model 2, increases in age, family income, and alcohol drinking show higher odds of functional limitation whereas education have lower odds of having any functional limitation (ADL/IADL). Alcohol drinking increases the odds of reporting items on ADL/IADL by 1.62 times whereas educational attainment decreases the odds of reporting ADL/IADL by 38 percent (model 2).

Next, Model 3 looks at chronic disease diagnosis by a physician since the previous survey data. Except for previous health outcome, none of the variables in the model have a significant relationship with chronic condition diagnosis. Model 4 assesses prediction on prevalence of any bodily pain. Subjective social status fails to achieve a significant relationship with prevalence of any bodily pain. It is noted that in Model 4, mid- and old-aged men have 75 percent lower odds of reporting any bodily pain than

women. Finally, Model 5 focuses on predicting cognitive functioning (MMSE). I find that SSS has no significant association with cognitive functioning (MMSE). It is noted that age increases the likelihood whereas a unit increase in educational attainment and doing regular exercise decreases the odds of reporting cognitive issues (MMSE).

Conclusion

This chapter, in a cross-national exploration of subjective social status (SSS), traditional socioeconomic status (SES), and health conditions of mid- and old-age population in two major metropolitan cities, Tokyo, Japan and Seoul, South Korea, has contributed a number of innovative findings to the socioeconomic disparities in health literature.

First, in Tokyo, Japan sample, SSS has a positive relationship with the following subjective health outcomes: overall life satisfaction, perceived control over health, and depressive symptoms. Whereas in Seoul, South Korea sample, SSS has a strong positive relationship with higher overall life satisfaction and current health satisfaction measures and a moderate relationship with less depressive symptoms and better self-rated health as well as less likelihood of any self-reported functional limitation (ADL/IADL). Consistent with the previous research, a positive association between SSS and health is found in South Korea (Wen and Gu, 2011; Ellen et al., 2001). This finding is consistent with other literature suggesting the association between SSS and health even net of all socioeconomic controls (Adler, et al., 2000; Operario, et al., 2004; Gruenewald, et al., 2006; Ghaed and Gallo, 2007).

Table 4.3.

Bivariate Correlation for Key Variables, Midlife Development in Japan

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2	.47																		
3	.27	.27																	
4	-.35	-.29	-.10																
5	-.17	-.28	-.02	.18															
6	.13	.16	-.03	-.16	-.12														
7	-.09	-.26	.00	.10	.25	-.12													
8	.25	.13	.17	-.19	-.04	.04	-.01												
9	.02	-.07	.11	-.08	.30	-.09	.09	.08											
10	-.13	-.11	-.03	-.10	-.01	.04	-.05	.10	.02										
11	.12	.11	.07	-.04	-.11	.02	-.07	.18	-.29	.21									
12	.14	.07	-.02	-.09	.03	-.09	-.03	.14	.10	.08	.08								
13	.00	.02	-.02	.01	-.09	.06	-.04	.02	-.36	.22	.20	-.04							
14	.05	-.01	.06	-.01	.09	-.03	.01	.09	.38	-.02	.02	.01	-.19						
15	.08	.05	.00	.01	-.02	.01	-.04	.05	-.07	-.02	.07	.32	.01	.06					
16	-.22	-.12	-.11	.17	.01	.01	.00	-.17	-.08	.02	-.05	-.05	.08	-.13	.08				
17	.17	.17	.09	-.06	-.04	-.01	-.01	.17	-.05	-.22	.06	.00	.01	-.01	.01	-.05			
18	-.15	-.13	-.13	.06	-.05	.01	.05	.00	-.19	.25	.00	-.06	.13	-.11	.02	.11	-.04		
19	-.05	-.02	-.02	-.02	-.01	.01	.03	.07	-.01	.33	.05	.03	.16	-.06	.07	.01	-.03	.19	
20	.14	.20	.21	-.09	-.10	.00	-.02	.16	-.07	-.04	.18	.00	-.02	.06	.03	-.10	.12	-.09	.01

1. Overall life satisfaction 2. Current health quality 3. Control over health 4. Depressive symptoms 5. Depressive symptoms 6. ADL/IADL (difficulty=1) 7. Chronic conditions (any=1) 8. Bodily pain (any=1) 9. Subjective social status (SSS) 10. Age 11. Sex (Male=1) 12. Married (=1) 13. Education (1-4) 14. Family hardship (1=yes) 15. House (owned=1) 16. Currently employed (=1) 17. Friendship support 18. Number of household members besides children or self 19. Cigarette smoking 20. Alcohol drinking 21. Exercise

Table 4.4

Bivariate Correlation for Key Variables, Korean Longitudinal Study of Ageing (Seoul)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2	.28																			
3	.42	.68																		
4	-.29	-.45	-.49																	
5	-.19	-.27	-.40	.31																
6	.00	.04	.01	.09	.05															
7	-.31	-.15	-.28	.30	.15	.00														
8	-.24	-.23	-.31	.34	.28	.02	.24													
9	.32	.53	.38	-.21	-.13	.03	-.15	-.14												
10	-.42	-.25	-.42	.15	.24	-.04	.31	.33	-.16											
11	.07	.03	.13	-.11	.00	.04	-.39	-.15	.02	-.07										
12	.36	.32	.38	-.22	-.18	.06	-.33	-.32	.37	-.48	.31									
13	.20	.28	.22	-.14	-.07	.05	-.22	-.15	.27	-.31	.24	.31								
14	.31	.13	.25	-.14	-.12	.01	-.28	-.21	.09	-.44	.35	.28	.21							
15	.13	.24	.09	-.04	.01	.05	-.03	-.01	.45	.03	.02	.09	.19	-.02						
16	.38	.36	.34	-.20	-.11	.02	-.25	-.19	.57	-.39	.06	.43	.31	.27	.29					
17	.01	.16	.06	.01	-.04	.02	.03	.02	.09	.02	-.11	.05	.06	-.01	.14	.05				
18	.17	.16	.15	-.12	-.07	.04	-.19	-.15	.23	-.25	.07	.18	.30	.14	.13	.43	.03			
19	-.00	-.03	.07	-.04	-.00	.02	-.25	-.07	-.07	-.14	.65	.19	.09	.26	-.04	.04	-.08	.04		
20	-.11	-.08	-.21	.10	.08	-.07	.28	.17	-.09	.22	-.55	-.25	-.16	-.31	-.07	-.17	.02	-.07	-.49	
21	.10	.23	.14	-.11	-.07	-.00	-.06	-.08	.23	-.02	.08	.18	.08	-.07	.14	.10	.07	-.03	-.01	-.09

1. Self-rated health 2. Overall life satisfaction 3. Health satisfaction 4. ADL/IADL 5. MMSE 6. CES-D10 7. Chronic disease (yes=1) 8. Bodily pain (yes=1) 9. Subjective Social Status (SSS) 10. Age 11. Sex (male=1) 12. Married 13. Education 14. Family income 15. House (owned=1) 16. Employed (current=1) 17. Urban (=1) 18. Friendship Contact 19. Number people in household 20. Cigarette smoking 21. Alcohol drinking 22. Exercise

Next, I will compare the objective SES indicators and health of the two samples. While education plays the most significant role predicting several health outcomes of the mid- and old-age adult population in Seoul, South Korea, almost none of the SES measures is associated with health outcomes for population in Tokyo, Japan. Only the presence of financial hardship measure has a significant impact in a decrease of overall life satisfaction. Also, it is noteworthy that doing regular exercise has several significant relationships with better health outcomes in Japanese mid and old-age sample. The findings of sample in Seoul, South Korea support other research that employment status and home ownership are less consistently associated with health status (Adler, et al., 2000; Demakakos, et al., 2008). Also, the variation in the association of education and income for each of the domain indicate that the traditional indicators may have better utility for some domains (such as functional and cognitive limitation) rather than others.

Several possibilities might account for the findings for the Japanese sample. First, prior research found that social inequalities and their influence on health in Japan is relatively low. Throughout history, Japan has been considered as egalitarian society in terms of the world's highest standards in longevity. Previous study findings have shown that the effect of objective SES on health is smaller than in North America or Europe (Kagamimori et al., 2008; Hanibuchi et al., 2012). However, it is also suggested that Japanese in general prefer to give a midpoint or close to the middle response rather than express definite agreement or disagreement. Thus, wording in response categories with "very" or "strongly" might have biased the response in some of health outcome measures (Shishido et al., 2009).

While this research has proposed a variety of elements in a cross-national comparison on the association between SSS and health outcomes of mid and later life adult population in metropolitan cities in Japan and South Korea, the study is limited for a number of reasons. First, due to unavailability in MIDJA, the findings in this study are not from nationally representative samples of Japan and South Korea. Future study should utilize nationally representative samples so that the results can generalize to a broader region and general population. Next, even though I employ a longitudinal design, the results do not necessarily imply a causal relationship. However, in this longitudinal design, I was able to control for an extensive set of variables (and more than any previous research) in the association between SSS and health of mid- and old-age adults. Further waves of longitudinal analyses are needed to tease out the causal directions which would provide insights into the health causation debates as well as to evaluate life-time somatic symptoms such as depressive symptoms and chronic conditions.

Since I utilize a cross-national study comparing two different datasets, several main independent and dependent variables do not parallel completely. The measure of subjective social status (SSS) which is the key independent variable of interest, does not match completely due to the data available. The question on KLoSA asks about social class with six possible answer categories, whereas the question on MIDJA uses the McArthur ladder scale with ten possible answer categories. While I was able to investigate cross-national differences on the link between SSS and health, treating subjective social class measure as linear, my ability to attain information regarding the full, linear SES, which is relevant to health research health-SES gradients is limited (Elo, 2009). Also, some suggest that relying on naming categories such as “middle” or “upper”

class may influence people's selection of a social class, which may not accurately reflect their perceptions of their social standing (Wolff et al., 2010). Since the McArthur ladder scale has been growing in popularity in SES and health data collection and research, future research should utilize the same SSS scales for cross-national comparison analyses.

Also, educational attainment is measured differently. KLoSA has four categories of degrees whereas MIDJA has eight categories. Also, in MIDJA, the first wave does not provide the family income measure which is only included in the second wave. Japanese individuals tend to avoid responding to income questions because in Japanese culture, it is virtue that money is important but not talked about with other people (Yamaoka, 2008). This should be taken into consideration for future research.

South Korea and Japan, like other East Asian Confucian countries, are highly gender differentiated. Confucianism still persists as a cultural force in Korean society. It regards the male as a positive being (yang) and the female as a negative counterpart (ying). Future research should analyze gender differences of determinants of SSS and in intersections of SES, SSS and health. In addition, while rates of suicide mortality have been decreasing among most OECD countries, South Korea and Japan are two important exceptions to the broader trend toward lower suicide rates in OECD countries. Although Japan and South Korea are neighboring countries with shared histories, industrial structures, social systems, and some demographic characteristics, the causes of increasing suicide rates in the two countries clearly varies with the social contexts of each country. Therefore, future cross-national studies focusing on Japan and South Korea should

consider SSS measurement to explore socially and nationally unique characteristics and phenomenon.

Despite some limitations, this cross-national study enhances understanding of the role of subjective social status in the health of mid- and old-age adult in two metropolitan areas in Tokyo, Japan and Seoul, South Korea. As discussed in the introduction, the effects of subjective social status on health status have already been extensively studied in both Western countries (Roh et al. 2011; Subramanian et al. 2006; Hill, Ross, and Angel 2005) and East Asia (Fujino et al., 2005; Wen et al., 2011; Bassani, 2008). Comparison across countries, especially in Japan and South Korea, has received far less attention. This study seeks to fill the research gap by assessing the intersection of SSS, SES, and health in two metropolitan areas in Japan and South Korea and making comparisons across these two countries.

The evidence of this study implies that the traditional objective SES itself may not be an adequate measure for constituting the dimensions of SES. As it is suggested through past findings, there is a psycho-social process through which people lower in the social status are subject to negative health outcomes by comparing themselves with higher social classes (Wilkinson, 1996; 1997). SSS as a subjective measurement of SES, therefore should continue to be considered as a measurement that reflects the psych-social process better than other objective indicators such as education or income.

More importantly, this study has found evidence that these effects actually vary by country, adding to a growing literature studying the effects of one's perceived social standing on a wide range of health outcomes in cross-national contexts. It is anticipated that findings from this study will provide guide to the general public about more causes

of social inequality in health other than traditional socioeconomic characteristics, at the same time, also aid policymakers in making more effective policies to reduce possible adverse effects of socioeconomic disparities on population's health.

CHAPTER FIVE

Conclusion

Using the most recent and best available data source with nationally representative samples in South Korea and the United States, and also a Japanese sample in the Tokyo metropolitan area, this dissertation examines the association between subjective social status (SSS) and a wide-range of health outcomes among mid- and old-age adult populations. The findings of this study provide scientific and empirical evidence which supports the goal of better understanding between SSS and adult health and the correlation between culture and health.

In this final chapter, I first review the central findings yielded from my analyses and highlight some conclusions that can be drawn from the dissertation as a whole. Then I review some of the limitations of my study and recommendations and possible directions for future research.

Summary of Central Findings

My dissertation confirmed previous research that a substantial relationship exists between subjective social status (SSS) and some health outcomes. First, SSS has more significant and stronger associations with both psychological and physical health outcomes among mid- and old-aged South Koreans, compared to the sample in the United States. The results are similar when the sample is restricted to Seoul, metropolitan area in South Korea versus the Japanese sample in the Tokyo metropolitan area. These

findings might support an expanded understanding of the interrelationship between economic inequality and SSS as well as their impact on the health of individuals in a society.

Second, SSS shows significant relationships with psychological and self-perceived health outcomes: overall life satisfaction, control over health, self-rated mental health, and health comparison to other people in the same age group for mid- and old-age populations in the United States and Tokyo. However, net of all controls, none of the prevalence of negative physical health outcomes, such as chronic conditions, bodily pain, and functional limitation (ADL/IADL) show significant associations with SSS in either the Japanese or United States sample.

Third, this study catches differences in the relationship between other covariates and health outcomes. While middle and older-aged men in the United States have no significant relationship with reporting any bodily pain, men in South Korea (more than 50% nationwide, more than 70% Seoul, metropolitan area) and Tokyo, Japan (more than 55%) show less likelihood of reporting bodily pain. The results could be explained by the different cultural expectations for men. In South Korea and Japan, men have to be strong and not to show any signs of weakness (Ryff et al., 2015).

Fourth, in terms of the association between objective SES indicators and health, educational attainment consistently shows a significant association (often greater than family income) with health outcomes (about 25% less likelihood of cognitive disability (MMSE) and about 15% less likelihood of bodily pain) for mid- and old-aged South Koreans. In contrast, family income and full-time employment status have more significant associations with health outcomes: self-rated health, current health quality,

self-rated mental health, health comparison to the same age group, functional limitation (ADL/IADL) (more than 30% less likelihood for those who are full-time employed) for the adult sample in the United States. Lastly, for the adult sample in Tokyo, Japan, financial hardship only shows a significant relationship with one of all tested health outcomes: overall life satisfaction. For Japan, demographic characteristics such as marital status and sex show greater significance in relationship to the prevalence of any chronic condition, bodily pain, and depressive symptoms.

The difference in these results suggests that the structural characteristics of the health care system may influence the health of individuals. Current full-time employment status and family income play a more significant role than education in health in the United States. This could be due to the market-based health insurance system. Unlike in the United States, South Korea and Japan have universal health coverage through a combination of employer-based plans and national insurance, and everyone is covered by one or the other of these regardless of her or his employment status.

In contrast to previous findings, different results in the effect of educational attainment on health might indicate that the economic structure and development in a society have a different influence on the individual's health. For example, in Japan, education is not as strongly emphasized as South Korea, and those who have part-time jobs in Japan can easily meet their living expenses. Previous studies on objective SES and health with a South Korean sample have shown that the effect of education is dominant over occupation and income. The authors explained that the role of education may be particularly strong for South Korea because the strategy for economic survival within the pressure of domestic capitalism and imperialism has been through massive

investment in education (Son et al., 2002; Son et al., 2012). Another possible explanation is that the effect of education in a more developed country is weaker than a less developed countries because the level has already been achieved (Smith et al., 1998). Therefore, in South Korea, which is relatively less developed than the United States and Japan, education may exhibit a stronger effect on health.

Cross-national Comparison on Effect Size of SSS on Health Outcomes

In addition to disentangling the relationship between one's perception of own social standing and health within social context, the other goal of the final chapter is to further understand the interrelationships between SES, SSS, and health by addressing the following questions: what role does SES play in shaping the association or magnitude of the link between SSS and health outcomes? Additionally, among South Korea, the United States, and Tokyo, Japan, in which country does SSS matter the most for health? Therefore, I further assessed the effect size of the bivariate relationship between SSS on health outcomes as well as the influence of main covariates on SSS and health, continuing to utilize longitudinal datasets (See tables in Appendix).

Each model presents a bivariate relationship between SSS and a particular health outcome and the other with an additional relevant covariate predictor. Only those that show statistical significance and have the greatest impact on SSS and health linkage, are presented in the model.

First, in terms of the bivariate relationships between SSS and health outcomes, controlling for previous health outcome, SSS has the greater effect size on subjective health outcome measures such as self-rated health, overall life satisfaction, and perceived control over health to mid- and old-age population in South Korea, the United States, and

Tokyo, Japan. Specifically, findings in a nationally representative sample of South Korean, SSS has the greatest effect size on overall life satisfaction ($B=.249$) presented in Appendix, Chapter Two, Model 1 in Table A1., Chapter Two. In the United States sample, SSS has the biggest effect size on health compared to the same age group measure ($B=.138$) presented in Appendix, Chapter Three, Model 2 in Table A3. For the Japanese metropolitan sample, the greatest effect size of SSS is on perceived control over health ($B=.111$) presented in Appendix, Chapter Four, Model 2 in Table A6. Therefore, the overall effect size findings suggest that SSS presents greater impact on overall health outcomes to mid- and old-age adult population in South Korea compared to the similar age population in the United States and Japan.

Second, findings on changes of the effect size of SSS by adding relevant predictors in the model show that for mid- and old-age adults in South Korea, the standardized coefficient of SSS drops significantly on predicting some health outcomes once family income is added: overall life satisfaction ($B=.249$ to $.202$) in Model 1, perceived health satisfaction ($B=.201$ to $.132$) in Model 2, depressive symptoms ($B=-.092$ to $-.05$) in Model 3 in Appendix, Chapter Two, Table A5., and lastly, self-rated health ($B=.156$ to $.081$) in Model 1 in Table A2. Models 2 through 4 in Table A2. show that the standardized coefficient of SSS reduces in a greater level when education is added into an analysis predicting bodily pain ($B=-.169$ to $-.095$) and cognitive disability ($B=-.176$ to $-.086$). A similar pattern is observed for the selected sample population in Seoul, metropolitan area in South Korea. For the sample of the United States, although education and family income reduce the standardized coefficient of SSS, none of the analyses present a significant change in standardized coefficient of SSS on health

outcomes (less than .03) prior to and after adding covariates. The same result is shown for the sample population in Tokyo. Unlike sample in South Korea, where education is a consistent measure across the relationships between SSS and health outcomes, in the sample of the United States, regular exercise measure is the consistent measure across the relationships between SSS and health outcomes.

Overall, I believe my cross-national comparisons over the bivariate relationships of SSS predicting health outcomes as well as adding each key covariate to the relationship between SSS and each health outcome provide a valuable contribution to the literature on the interconnection between SSS, SES, and health. Future research in the cross-national subjective socioeconomic hypothesis should continue to utilize similar measure.

Limitation of This Study and Future Direction of Research

While there are central and novel findings gained from my research, there exist a number of limitations that provide directions for future research. First, the measure of SSS which is the key independent variable of interest, does not match completely due to the data available. The question on KLoSA asks social class with six possible answer categories, whereas the question on MIDUS and MIDJA uses McArthur Ladder Scale with ten possible answer categories. While I was able to investigate cross-national differences on the link between SSS and health, treating subjective social class measure as linear, my ability to attain information regarding the full, linear SES, which is relevant to health research health-SES gradients is limited (Elo, 2009). It is suggested that relying on categories such as “middle” or “upper” class is attached to and influenced by cultural perceptions and norms of social class. Thus, this measure may not accurately reflect an

individual's perceptions of own social standing (Wolff et al., 2010). Since McArthur ladder scale has been growing in popularity in SES and health data collection and research, future research should utilize the same SSS scales for cross-national comparison analyses.

Second, regarding the particular sample population in this study: mid- and old-age adults, the SES-health link among these samples need to be improved in future research. Wealth, presumably an important determinant of the health among mid- and old-age population, is not measured in this study. Additionally, only Wave II in MIDJA asks the respondent's family income, therefore I substituted this data using the question that asks whether the respondent experience any financial hardship in the family. Given that conventional SES measures like education and income do not have considerable health effects among these population in the United States and Japan, wealth might be an important predictor. Thus, more elaborate measurements of wealth need to be considered, such as assets (e.g., stocks, mutual funds, retirement accounts, etc.) and liabilities (e.g., mortgage debts, business debts, secured/unsecured debts, etc.). A promising research direction is to analyze how dynamic changes of socioeconomic and social status of this particular population relate to various health outcomes.

Third, due to data availability of MIDUS and MIJA, which only have two Waves by far, I chose to utilize Wave II and Wave V of KLoSA data. However, I believe that future research should include Wave III and Wave IV data regarding respondents' own SSS to capture a more dynamic measure of own SSS across the life course. It will be interesting to see the extent to which individuals change their SSS during the 8 years or

so between Waves II and V, and the extent to which changes in SSS and psychosocial variables can explain changes in SSS from midlife to later life.

While statistical regressions of quantitative variables in my study uncover the importance of SSS as a socioeconomic indicator to various health outcomes, the analysis is limited in explaining causal claims and variations from respondents themselves about who is the reference group they compare to and what markers of status they may be using in these comparisons. To do so, future research in this area must include more sophisticated and concrete analysis pathways as well as utilize qualitative or mixed-methods such as interviews and focus groups.

Furthermore, there has been a growing collection of objective biomarkers of physiological regulation in health data sets, increasing attention has turned into assessing how SES is related to markers of immune, cardiovascular, and metabolic function (Wolfe et al., 2012). To date, none of the health datasets in South Korea have collected biomarkers. Therefore, including and examining objective biomarkers of physiological functioning in upcoming studies may help identify growing health disparities in health risk before disease emerges.

Significance and Implications

Despite some limitations, this study as a whole attempts to fill a gap within the current literature, contributing to the intersections of the cross-culture, health, and social stratification literature. In this final section, I offer some thoughts on several implications for health and social policy and what the future may hold concerning SSS, perceived social inequality, and health outcomes, specifically in the developed societies.

My study also demonstrates that although Japan and South Korea, are considered developed Asian countries, the results indicate that they exhibit different contexts compared to Western countries when studying the effects of perceived social standing on health. After World War II, both Japan and South Korea have achieved rapid industrialization as a result of strong government interventions (Johnson 1982; Diebold and Alice 1990; Kim and Maeda 2001), and both countries are ageing countries, which makes them comparable to Western countries to some extent. However, population densities in both countries are almost ten times greater than the United States (Bassani 2008; Lee and Shinkai 2003), which makes their built infrastructure and social structures very different from those of Western countries. Moreover, in the United States, neighborhood or community factors are defined on the basis of race and/or ethnicity. However, there is no point in using race or ethnicity as a control variable in East Asian countries since the vast majority of people are of one race or ethnicity in South Korea and Japan (over 95% of the population). Therefore, the future research should consider greater ethnic and cultural diversity, which plays a key role in shaping an individual's perception and reality in Western countries. As very few studies compared these three countries, my dissertation makes a noteworthy contribution to the cross-national health literature.

As a whole, my dissertation makes relevant contributions to both academic research and provides implications to health policies of the ageing population. Because other neighboring countries like China and Taiwan share similar cultural characteristics with South Korea and Japan, it is also expected that the question on the linkage between self-perception of social status and health will be applicable for future research in other

rapidly ageing Asian societies as well. Health professionals who work with the older population can benefit from the knowledge gained from the dissertation. Although the United States, Japan, and South Korea are considered economically developed countries and aging societies, the results of socioeconomic disparities in the health of these three countries clearly vary. Therefore, developing individual interventions or formulating social or health policies for mid- and old-age adult population should focus on one's different socioeconomic and cultural backgrounds. In addition to reducing levels of poverty for mid- and old-age adult population, efforts to reduce overall socioeconomic inequality and thus improve low-status individuals' perceived relative social position would also confer additional health benefits.

Finally, I believe my research demonstrates and provides additional evidence for the importance of considering SSS as a key measure to include in health studies. I would argue that SSS is both a better measure of SES than any single objective SES indicator, and an indicator of SES that is extremely useful for further understanding socioeconomic health disparities. In addition, response rates for the SSS question are typically very high and meaningful that I strongly suggest health researchers should include SSS in more demographic and health studies and continue to further understand SSS as an empirical measurement and a theoretical concept.

As Marmot (2005) suggested, the most critical issue and purpose in social justice are to meet human needs, studies on social determinants of health inequalities must have between and within the country analysis. Therefore, it is crucial that scholars in social science and public health continue to make efforts to assess social determinants of health and well-being in Western, Asian, and other countries globally.

Like all research, the end of this project resulted in additional questions. Each chapter of this dissertation responds to a particular gap in the literature but in doing so it makes room for subsequent research. I plan on accomplishing some of this work but I hope that my efforts will spur on other researchers to further investigate the story of subjective social status (SSS) and health disparity.

APPENDIX

APPENDIX A

Chapter Two Additional Tables

Table A1.

Ordinary Least Square (OLS) Coefficients from the Regression of Overall Life Satisfaction, Perceived Health Satisfaction, and Depressive Symptoms in Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables

	Model1		Model 2		Model 3	
Variables	Overall Life Satisfaction		Perceived Health Satisfaction		Depressive Symptoms (CES- D10)	
Previous health outcome	.287 (.312)	.274 (.299)	.331 (.353)	.299 (.319)	.35 (.335)	.32 (.311)
Subjective social status (SSS)	3.74 (.249)	3.02 (.202)	3.53 (.201)	2.30 (.132)	-.24 (-.092)	-.13 (-.05)
Age						
Male (=1)						
Education						
Married(=1)						
Employed (=1)						
House (own=1)						
Family income		.677 (.114)		1.36 (.196)		-.11 (-.107)
Number of people in the household						
Friendship contact						
Urban (=1)						
Cigarette smoking						
Alcohol drinking						
Exercise (=1)						

Source: Korean Longitudinal Study of Ageing, 2008-2014

All values weighted, * <.05 ** <.01 ***<.001

Standardized coefficients (B) (in brackets)

Note: Variables that only explain coefficient changes of SSS are listed in the model

Table A2.

Odds Ratios from Ordered Logistic Regression of Self-rated Health, Functional Limitation (ADL/IADL), Bodily Pain on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables

	Model 1		Model 2		Model 3		Model 4	
Variables	Self-rated Health		Functional Limitation (ADL/IADL)		Bodily Pain		Cognitive Disability (MMSE)	
Previous health outcome	2.31 (.456)	2.13 (.413)	13.12 (.415)	12.91 (.413)	4.67 (.415)	3.70 (.352)	9.03 (.523)	6.27 (.436)
Subjective social status (SSS)	1.28 (.156)	1.14 (.081)	.77 (-.164)	.84 (-.111)	.76 (-.17)	.86 (-.09)	.75 (-.176)	.84 (-.086)
Age								
Male (=1)								
Education				.73 (-.187)		.65 (-.25)		.54 (-.355)
Married(=1)								
Employed (=1)								
House (own=1)								
Family income		1.13 (.199)						
Number of people in the household								
Friendship contact								
Urban (=1)								
Cigarette smoking								
Alcohol drinking								
Exercise (=1)								

Source: Korean Longitudinal Study of Ageing, 2008-2014

All values weighted, * <.05 ** <.01

***<.001

Standardized coefficients (B) (in brackets)

Note: Variables that only explain coefficient changes of SSS are listed in the model

Chapter Three Additional Tables

Table A3.

Ordinary Least Square (OLS) Coefficients from the Regression of Overall Life Satisfaction in Subjective Social Status (SSS), Health behaviors, and Sociodemographic Control Variables

	Model1		Model 2		Model 3		Model 4	
Variables	Overall Quality of Life		Perceived Control over Health		Self-rated health		Current Health Quality	
Previous health outcome	.55 (.496)	.54 (.487)	.499 (.471)	.498 (.466)	.60 (.525)	.57 (.495)	.60 (.525)	.57 (.523)
Subjective social status (SSS)	.113 (.127)	.107 (.12)	.083 (.079)	.067 (.065)	-.04 (-.076)	.03 (.06)	.04 (.076)	.035 (.039)
Age		.01 (.06)						
Male (=1)								
Education								
Married(=1)								
Employed (=1)								
House (own=1)								
Family income				.065 (.095)		.05 (.124)		
Number of people in the household								
Friendship support								
Cigarette smoking								
Alcohol drinking								
Exercise (=1)							.049 (.105)	

Source: Midlife Development in the United States 2004-2014

* <.05 ** <.01 ***<.001

Standardized coefficients (**B**) (in brackets)

Note: Variables that only explain coefficient changes of SSS are listed in the model

Table A4.

Odds Ratios from Ordered Logistic Regression of Self-rated Mental/Emotional Health, Perceived Health Comparison, Functional Limitation (ADL/IADL), and Bodily Pain on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables

	Model 1		Model 2		Model 3		Model 4	
Variables	Self-rated Mental Health		Health Comparison		Functional Limitation (ADL/IADL)		Bodily Pain	
Previous health outcome	2.64 (.482)	2.57 (.467)	3.28 (.593)	3.23 (.587)	8.76 (.595)	8.09 (.573)	6.31 (.415)	5.79 (.395)
Subjective social status (SSS)	.113 (.127)	1.11 (.104)	1.15 (.138)	1.12 (.118)	.92 (-.081)	.94 (-.059)	.97 (-.031)	.98 (-.015)
Age								
Male (=1)								
Education		1.12 (.161)		1.08 (.114)				
Married(=1)								
Employed (=1)								.45 (-.21)
House (own=1)								
Family income						.89 (-.17)		
Number of people in the household								
Friendship support								
Cigarette smoking								
Alcohol drinking								
Exercise (=1)								

Source: Midlife Development in the United States 2004-2014

* <.05 ** <.01 ***<.001

Standardized coefficients (**B**) (in brackets)

Note: Variables that only explain coefficient changes of SSS are listed in the model

Chapter Four Additional Tables

Table A5.

Coefficients from the Ordinary Least Squares (OLS) Regression of Overall Life Satisfaction, Perceived Control over Health, Current Health Quality, and Depressive Symptoms on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables, MIDJA (JAPAN)

	Model 1		Model 2		Model 3		Model 4	
Variables	Overall Life Satisfaction		Perceived Control over Health		Current Health Quality		Depressive Symptoms	
Previous health outcome	.542 (.544)	.523 (.524)	.423 (.431)	.399 (.407)	.55 (.512)	.544 (.509)	.49 (.493)	.49 (.492)
Subjective social status (SSS)	.102 (.103)	.094 (.095)	.117 (.102)	.108 (.102)	.039 (.04)	.027 (.025)	-.11 (-.103)	-.095 (.093)
Age								
Male (=1)								
Education								
Married(=1)								
Employed (=1)								
House (own=1)								
Financial hardship (yes=1)		-.157 (-.025)						
Number of people in the household								
Friendship support						.349 (.104)		
Cigarette smoking								
Alcohol drinking								
Exercise (=1)				.441 (.096)				-.384 (-.086)

Source: Midlife Development in Japan 2008-2012

* <.05 ** <.01 ***<.001

Standardized coefficients (**B**) (in brackets)

Note: Variables that only explain coefficient changes of SSS are listed in the model

Table A6

Odds Ratios from Binary Logistic Regression of Prevalence of Functional Disability (ADL/IADL) and Bodily Pain on Subjective Social Status (SSS), Health Behaviors, and Sociodemographic Control Variables, MIDJA (JAPAN)

Variables	Model1		Model 2	
	Functional Limitation (ADL/IADL)		Bodily Pain	
Previous health outcome	9.4 (.547)	9.04 (.538)	3.54 (.217)	3.3 (.204)
Subjective social status (SSS)	.96 (-.046)	.975 (-.029)	.95 (-.053)	.97 (-.032)
Age				
Male (=1)				
Education				.88 (-.148)
Married(=1)				
Employed (=1)				
House (own=1)				
Family income				
Number of people in the household				
Friendship support				
Cigarette smoking				
Alcohol drinking				
Exercise (=1)		.583 (-.142)		

Source: Midlife Development in Japan 2008-2012

* <.05 ** <.01 ***<.001

Standardized coefficients (**B**) (in brackets)

Note: Variables that only explain coefficient changes of SSS are listed in the model

BIBLIOGRAPHY

- Adler, N. E., Boyce, T., Chesney, M. A., Cohen, S., Folkman, S., Kahn, R. L., & Syme, S. L. (1994). Socioeconomic status and health. The challenge of the gradient. *The American Psychologist*, 49(1), 15–24.
- Adler, N. E., Boyce, W. T., Chesney, M. A., Folkman, S., & Syme, S. L. (1993). Socioeconomic inequalities in health. No easy solution. *JAMA*, 269(24), 3140–3145.
- Adler, N. E., Epel, E. S., Castellazzo, G., & Ickovics, J. R. (2000). Relationship of subjective and objective social status with psychological and physiological functioning: Preliminary data in healthy, White women. *Health Psychology*, 19(6), 586–592. <https://doi.org/10.1037/0278-6133.19.6.586>
- Adler, N. E., & Ostrove, J. M. (1999). Socioeconomic status and health: what we know and what we don't. *Annals of the New York Academy of Sciences*, 896, 3–15.
- Adler, N. E., & Newman, K. (2002). Socioeconomic disparities in health: pathways and policies. *Health Affairs*, 21(2), 60–76. <https://doi.org/10.1377/hlthaff.21.2.60>
- Adler, N. E., & Stewart, J. (2007). The MacArthur Scale of subjective social status summary prepared in collaboration with the psychosocial working group. Retrieved from <http://www.macses.ucsf.edu/research/psychosocial/subjective.php>
- American Psychological Association. (2010). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC: American Psychological Association.
- Anderson, N. B., & Armstead, C. A. (1995). Toward understanding the association of socioeconomic status and health: a new challenge for the biopsychosocial approach. *Psychosom Med*, 57. <https://doi.org/10.1097/00006842-199505000-00003>
- Andersson, G. (2007). Chronic pain and praying to a higher power: Useful or useless? *Journal of Religion and Health*, 47(2), 176–187. <https://doi.org/10.1007/s10943-007-9148-8>
- Andersson, M. A. (2015). How do we assign ourselves social status? A cross-cultural test of the cognitive averaging principle. *Social Science Research*, 52, 317–329. <https://doi.org/10.1016/j.ssresearch.2015.02.009>

- Andrulis, D. P. (1998). Access to care is the centerpiece in the elimination of socioeconomic disparities in health. *Annals of Internal Medicine*, 129(5), 412–416.
- Aneshensel, C. S., Wight, R. G., Miller-Martinez, D., Botticello, A. L., Karlamangla, A. S., & Seeman, T. E. (2007). Urban neighborhoods and depressive symptoms among older adults. *Journals of Gerontology Series B: Psychological Sciences & Social Sciences*, 62B(1), S52–S59.
- Bassani, C. (2006). A test of social capital theory outside of the American context: Family and school social capital and youths' math scores in Canada, Japan, and the United States. *International Journal of Educational Research*, 45(6), 380–403. <https://doi.org/10.1016/j.ijer.2007.03.001>
- Benyamini, Y., & Idler, E. L. (1999). Community studies reporting association between self-rated health and mortality. *Research on Aging*, 21, 392–401.
- Bjornstrom, E. E. S. (2011). An examination of the relationship between neighborhood income inequality, social resources, and obesity in Los Angeles county. *American Journal of Health Promotion: AJHP*, 26(2), 109–115. <https://doi.org/10.4278/ajhp.100326-QUAN-93>
- Bradshaw, M., & Ellison, C. G. (2010). Financial hardship and psychological distress: Exploring the buffering effects of religion. *Social Science & Medicine*, 71(1), 196–204. <https://doi.org/10.1016/j.socscimed.2010.03.015>
- Braveman, P. A., Cubbin, C., Egerter, S., Chideya, S., Marchi, K. S., Metzler, M., & Posner, S. (2005). Socioeconomic status in health research: one size does not fit all. *JAMA*, 294(22), 2879–2888. <https://doi.org/10.1001/jama.294.22.2879>
- Bravesmith, A. (2010). Can we be brief? *British Journal of Psychotherapy*, 26(3), 274–290. <https://doi.org/10.1111/j.1752-0118.2010.01186.x>
- Brunner, E. (1997). Socioeconomic determinants of health: Stress and the biology of inequality. *British Medical Journal*, 314(7092), 1472–1476.
- Bullock, H. E., & Limbert, W. M. (2003). Scaling the socioeconomic ladder: Low-income women's perceptions of class status and opportunity. *Journal of Social Issues*, 59(4), 693–709. <https://doi.org/10.1046/j.0022-4537.2003.00085.x>
- Choi, Y., Kim, J.-H., & Park, E.-C. (2015). The effect of subjective and objective social class on health-related quality of life: New paradigm using longitudinal analysis. *Health and Quality of Life Outcomes*, 13. <https://doi.org/10.1186/s12955-015-0319-0>

- Chun, H., Khang, Y.-H., Kim, I.-H., & Cho, S.-I. (2008). Explaining gender differences in ill-health in South Korea: The roles of socio-structural, psychosocial, and behavioral factors. *Social Science & Medicine*, 67(6), 988–1001.
<https://doi.org/10.1016/j.socscimed.2008.05.034>
- Cohen, S., Alper, C. M., Doyle, W. J., Adler, N., Treanor, J. J., & Turner, R. B. (2008). Objective and subjective socioeconomic status and susceptibility to the common cold. *Health Psychol*, 27. <https://doi.org/10.1037/0278-6133.27.2.268>
- Cornman, J. C., Gleib, D. A., Goldman, N., Ryff, C. D., & Weinstein, M. (2015). Socioeconomic status and biological markers of health: An examination of adults in the United States and Taiwan. *Journal of Aging and Health*, 27(1), 75–102.
<https://doi.org/10.1177/0898264314538661>
- Cundiff, J., Smith, T., Uchino, B., & Berg, C. (2013). Subjective social status: Construct validity and associations with psychosocial vulnerability and self-rated health. *International Journal of Behavioral Medicine*, 20(1), 148–158.
<https://doi.org/10.1007/s12529-011-9206-1>
- Davis J. A. (1956). Status symbols and the measurement of status perception. *Sociometry*. 19(3):154–165. doi: 10.2307/2785629.
- Demakakos, P., Nazroo, J., Breeze, E., & Marmot, M. (2008). Socioeconomic status and health: the role of subjective social status. *Social Science & Medicine*, 67(2), 330–340. <https://doi.org/10.1016/j.socscimed.2008.03.038>
- Duckitt J., & Mphuthing T. (2002). Relative deprivation and intergroup attitudes: South Africa before and after the transition. In I. Walker, H. J. Smith (Eds.), *Relative deprivation: Specification, development and integration* (pp. 60-90). Cambridge, UK: Cambridge University Press.
- Duncan, G. J., Brooks-Gunn, J., Yeung, W., & Smith, J. (1998). How much does childhood poverty affect the life chances of children? *American Sociological Review*, 63, 406-423.
- Dunn, B. D., Dalgleish, T., & Lawrence, A. D. (2006). The somatic marker hypothesis: A critical evaluation. *Neuroscience & Biobehavioral Reviews*, 30(2), 239–271.
<https://doi.org/10.1016/j.neubiorev.2005.07.001>
- Eaton, W. W., Muntaner, C., Bovasso, G., & Smith, C. (2001). Socioeconomic status and depressive syndrome: The role of inter- and intra-generational mobility, government assistance, and work environment. *Journal of Health and Social Behavior*, 42(3), 277–294.

- Elo, I. T. (2009). Social class differentials in health and mortality: Patterns and explanations in comparative perspective. *Annual Review of Sociology*, 35(1), 553–572. <https://doi.org/10.1146/annurev-soc-070308-115929>
- Ferraro, K. F., & Shippee, T. P. (2009). Aging and cumulative inequality: How does inequality get under the skin? *The Gerontologist*, 49(3), 333–343. <https://doi.org/10.1093/geront/gnp034>
- Forsén, L., Sogaard, A. J., Meyer, H. E., Edna, T., & Kopjar, B. (1999). Survival after hip fracture: short- and long-term excess mortality according to age and gender. *Osteoporosis International: A Journal Established as Result of Cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*, 10(1), 73–78.
- Franzini, L., & Fernandez-Esquer, M. E. (2006). The association of subjective social status and health in low-income Mexican-origin individuals in Texas. *Social Science & Medicine*, 63(3), 788–804. <https://doi.org/10.1016/j.socscimed.2006.01.009>
- Fujino, Y., Tamakoshi, A., Iso, H., Inaba, Y., Kubo, T., Ide, R., ... JACC study group. (2005). A nationwide cohort study of educational background and major causes of death among the elderly population in Japan. *Preventive Medicine*, 40(4), 444–451. <https://doi.org/10.1016/j.ypmed.2004.07.002>
- Gallo, L. C., & Matthews, K. A. (2003). Understanding the association between socioeconomic status and physical health: Do negative emotions play a role? *Psychological Bulletin*, 129(1), 10–51.
- Gallo, L. C., Smith, T. W., & Cox, C. M. (2006). Socioeconomic status, psychosocial processes, and perceived health: An interpersonal perspective. *Annals of Behavioral Medicine*, 31(2), 109–119. https://doi.org/10.1207/s15324796abm3102_2
- Garbarski, D. (2010). Perceived social position and health: Is there a reciprocal relationship? *Social Science & Medicine* (1982), 70(5), 692–699. <https://doi.org/10.1016/j.socscimed.2009.11.007>
- Ghaed, S. G., & Gallo, L. C. (2007). Subjective social status, objective socioeconomic status, and cardiovascular risk in women. *Health Psychology: Official Journal of the Division of Health Psychology, American Psychological Association*, 26(6), 668–674. <https://doi.org/10.1037/0278-6133.26.6.668>
- Goldman, B. S., Nierman, W. C., Kaiser, D., Slater, S. C., Durkin, A. S., Eisen, J. A., ... Kaplan, H. B. (2006). Evolution of sensory complexity recorded in a myxobacterial genome. *Proceedings of the National Academy of Sciences*, 103(41), 15200–15205. <https://doi.org/10.1073/pnas.0607335103>

- Goodman, E., Maxwell, S., Malspeis, S., & Adler, N. (2015). Developmental trajectories of subjective social status. *Pediatrics*, 136(3), e633–e640. <https://doi.org/10.1542/peds.2015-1300>
- Goodman, R. & Peng, I. (1996). The East Asian welfare states: Peripatetic learning, adaptive change, and nation-building. In G. Esping-Andersen (ed.), *Welfare States in Transition: National Adaptations in Global Economies* (pp. 192–223). London: Sage
- Green, J. G., McLaughlin, K. A., Berglund, P. A., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., & Kessler, R. C. (2010). Childhood adversities and adult psychopathology in the National Comorbidity Survey Replication (NCS-R) I: Associations with first onset of DSM-IV disorders. *Archives of General Psychiatry*, 67(2), 113. <https://doi.org/10.1001/archgenpsychiatry.2009.186>
- Gruenewald, T. L., Kemeny, M. E., & Aziz, N. (2006). Subjective social status moderates cortisol responses to social threat. *Brain, Behavior, and Immunity*, 20(4), 410–419. <https://doi.org/10.1016/j.bbi.2005.11.005>
- Haan, M. N., Kaplan, G. A., & Syme, S. L. (1989). Socioeconomic status and health: Old observations and new thoughts. In J. P. Bunker, D. S. Gomby, & B. H. Kehr (Eds.), *Pathways to health* (pp.76-135). Menlo Park, CA: The Henry J. Kaiser Family Foundation.
- Hanibuchi, T., Nakaya, T., & Murata, C. (2012). Socio-economic status and self-rated health in East Asia: a comparison of China, Japan, South Korea and Taiwan. *The European Journal of Public Health*, 22(1), 47–52. <https://doi.org/10.1093/eurpub/ckq174>
- Hill, T. D., Ross, C. E., & Angel, R. J. (2005). Neighborhood disorder, psychophysiological distress, and health. *Journal of Health and Social Behavior*, 46(2), 170–186. <https://doi.org/10.1177/002214650504600204>
- Hu, P., Adler, N. E., Goldman, N., Weinstein, M., & Seeman, T. E. (2005a). Relationship between subjective social status and measures of health in older Taiwanese persons. *Journal of the American Geriatrics Society*, 53(3), 483–488. <https://doi.org/10.1111/j.1532-5415.2005.53169.x>
- Hu, P., Adler, N. E., Goldman, N., Weinstein, M., & Seeman, T. E. (2005b). Relationship between subjective social status and measures of health in older Taiwanese persons. *Journal of the American Geriatrics Society*, 53(3), 483–488. <https://doi.org/10.1111/j.1532-5415.2005.53169.x>
- Idler, E. L., & Benyamini, Y. (1997). Self-rated health and mortality: A review of twenty-seven community studies. *Journal of Health and Social Behavior*, 38(1), 21–37. <https://doi.org/10.2307/2955359>

- Jackman, M. R. (1979). The subjective meaning of social class identification in the United States. *Public Opinion Quarterly*, 43(4), 443–462. <https://doi.org/10.1086/268543>
- Jackman, M. R., & Jackman, R. W. (1973). An interpretation of the relation between objective and subjective social status. *American Sociological Review*, 38(5), 569–582. <https://doi.org/10.2307/2094408>
- Jang, S.-N., Kawachi, I., Chang, J., Boo, K., Shin, H.-G., Lee, H., & Cho, S. (2009). Marital status, gender, and depression: Analysis of the baseline survey of the Korean Longitudinal Study of Ageing (KLoSA). *Social Science & Medicine*, 69(11), 1608–1615. <https://doi.org/10.1016/j.socscimed.2009.09.007>
- Kim, B. (2011). The politics of everyday exclusion in contemporary Japan. *Asian Perspective*, 35(2), 287–308. <https://doi.org/10.5555/0258-9184-35.2.287>
- Kim, I., Chen, & Spencer, M. S. (2012). Social determinants of health and mental health among Asian Americans in the United States. *Journal of the Society for Social Work and Research*, 3(4), 346–361. <https://doi.org/10.5243/jsswr.2012.21>
- Kim, I. K., & Maeda, D. (2001). A comparative study on sociodemographic changes and long-term health care needs of the elderly in Japan and South Korea. *Journal of Cross-Cultural Gerontology*, 16(3), 237–255. <https://doi.org/10.1023/A:1011957222884>
- Kim, J., Gershenson, C., Glaser, P., & Smith, T. W. (2011). The polls—trends in surveys on surveys. *Public Opinion Quarterly*, 75(1), 165–191. <https://doi.org/10.1093/poq/nfq047>
- Kopp M, Skrabski A, Réthelyi J, Kawachi I, & Adler N.E. (2004). Self-rated health, subjective social status, and middle-aged mortality in a changing society. *Behavioral Medicine*, 30(2), 65–70 6p.
- Krause, N., & Borawski-Clark, E. (1995). Social class differences in social support among older adults. *The Gerontologist*, 35(4), 498–508.
- Kwon, H. (2007). Advocacy coalitions and health politics in Korea. *Social Policy & Administration*, 41(2), 148–161. <https://doi.org/10.1111/j.1467-9515.2007.00544.x>
- Kwon, Y. C., Shin, D. W., Lee, J. H., Heo, D. S., Hong, Y. S., Kim, S.-Y., & Yun, Y. H. (2009). Impact of perception of socioeconomic burden on advocacy for patient autonomy in end-of-life decision making: A study of societal attitudes. *Palliative Medicine*, 23(1), 87–94. <https://doi.org/10.1177/0269216308099244>

- Lallukka, T., Lahelma, E., Rahkonen, O., Roos, E., Laaksonen, E., Martikainen, P., ... Kagamimori, S. (2008). Associations of job strain and working overtime with adverse health behaviors and obesity: Evidence from the Whitehall II Study, Helsinki Health Study, and the Japanese Civil Servants Study. *Social Science & Medicine*, 66(8), 1681–1698. <https://doi.org/10.1016/j.socscimed.2007.12.027>
- Lindbeck, A., Nyberg, S., & Weibull, J. W. (1999). Social norms and economic incentives in the welfare state. *The Quarterly Journal of Economics*, 114(1), 1–35. <https://doi.org/10.1162/0033553995555936>
- Link, B. G., & Phelan, J. (1995). Social conditions as fundamental causes of disease. *Journal of Health and Social Behavior*, 80–94. <https://doi.org/10.2307/2626958>
- Lundberg, J., & Kristenson, M. (2008). Is subjective status influenced by psychosocial factors? *Social Indicators Research*, 89(3), 375. <https://doi.org/10.1007/s11205-008-9238-3>
- Major, B., & O'Brien, L. T. (2005). The social psychology of stigma. *Annual Review of Psychology*, 56, 393–421. <https://doi.org/10.1146/annurev.psych.56.091103.070137>
- Marmot, M. (2004). Status syndrome. *Significance*, 1(4), 150–154. <https://doi.org/10.1111/j.1740-9713.2004.00058.x>
- Marmot, M., Kogevinas, M., & Elston, M. A. (1987). Social/economic status and disease. *Annual Review of Public Health*, 8(1), 111–135. <https://doi.org/10.1146/annurev.pu.08.050187.000551>
- Marmot M. (2004). *The status syndrome: How social standing affects our health and longevity*. New York, NY: Henry Holt and Company.
- Marmot, M. (2005). Social determinants of health inequalities. *The Lancet*, 365(9464), 1099–1104. [https://doi.org/10.1016/S0140-6736\(05\)71146-6](https://doi.org/10.1016/S0140-6736(05)71146-6)
- Marmot, M. G., Stansfeld, S., Patel, C., North, F., Head, J., White, I., Smith, G. D. (1991). Health inequalities among British civil servants: the Whitehall II study. *The Lancet*, 337(8754), 1387–1393. [https://doi.org/10.1016/0140-6736\(91\)93068K](https://doi.org/10.1016/0140-6736(91)93068K)
- Marshall, M. (1977). The nature of nurture. *American Ethnologist*, 4(4), 643–662. <https://doi.org/10.1525/ae.1977.4.4.02a00040>
- McEwen, B. S. (2000). The neurobiology of stress: from serendipity to clinical relevance. *Brain Research*, 886(1), 172–189. [https://doi.org/10.1016/S0006-8993\(00\)029504](https://doi.org/10.1016/S0006-8993(00)029504)

- McIntyre, D., Thiede, M., Dahlgren, G., & Whitehead, M. (2006). What are the economic consequences for households of illness and of paying for health care in low- and middle-income country contexts? *Social Science & Medicine*, 62(4), 858–865. <https://doi.org/10.1016/j.socscimed.2005.07.001>
- Meara, E. (2001). Why is health related to socioeconomic status? *National Bureau of Economic Research*. <https://doi.org/10.3386/w8231>
- Merton, R. K. (1968). The Matthew effect in science: The reward and communication system of science. *Science*, 199, 55-63.
- Mirowsky, J., Ross, C.E. (2003) *Education, social status, and health*. Jersey, NJ: Aldine Transaction.
- Moren-Cross, J. L., Wright, D. R., LaGory, M., & Lanzi, R. G. (2006). Perceived neighborhood characteristics and problem behavior among disadvantaged children. *Child Psychiatry and Human Development*, 36(3), 273–294. <https://doi.org/10.1007/s10578-005-0003-4>
- National Statistical Office (2006), Report on Mining and Manufacturing Survey, National Statistical Office, Seoul.
- Odagiri, Y., Uchida, H., & Nakano, M. (2011). Gender differences in age, period, and birth-cohort effects on the suicide mortality rate in Japan, 1985-2006. *Asia-Pacific Journal of Public Health*, 23(4), 581–587. <https://doi.org/10.1177/1010539509348242>
- Operario, D., Adler, N. E., & Williams, D. R. (2004). Subjective social status: Reliability and predictive utility for global health. *Psychology & Health*, 19(2), 237–246. <https://doi.org/10.1080/08870440310001638098>
- Ostrove, J.M., Adler, N. E., Kuppermann, M., & Eugene, A. (2000). Objective and subjective assessments of socioeconomic status and their relationship to self-rated health in an ethnically diverse sample of pregnant women. *Health Psychology*, 19(6), 613–618. <https://doi.org/10.1037/0278-6133.19.6.613>
- Park, Y. S., Kim, U., & Shin, Y. (2009). Filial behavior, expression, and its importance as perceived by parents of high school students: An indigenous psychological analysis. *The Korean Journal of the Human Development*, 16(2), 109–141.
- Phelan, J.C., Link, B.G., Stueve, A., & Pescosolido, B. (2000). Public conceptions of mental illness in 1950 and 1996: What is mental illness and is it to be feared. *Journal of Health and Social Behavior*, 41:188– 207

- Pickett, K., & Pearl, M. (2001). Multilevel analyses of neighborhood socioeconomic context and health outcomes: A critical review. *Journal of Epidemiology and Community Health*, 55(2), 111–122. <https://doi.org/10.1136/jech.55.2.111>
- Quon, E.C., & McGrath, J.J. (2014). Subjective socioeconomic status and adolescent health: A meta-analysis. *Journal of Health Psychology*, 33, 433–447.
- Rabin, R., & Charro, F. (2001). EQ-SD: A measure of health status from the EuroQol Group. *Ann Med*, 33. <https://doi.org/10.3109/07853890109002087>
- Reitzel, L. R., Vidrine, J. I., Li, Y., Mullen, P. D., Velasquez, M. M., Cinciripini, P. M., ... Wetter, D. W. (2007). The influence of subjective social status on vulnerability to postpartum smoking among young pregnant women. *American Journal of Public Health*, 97(8), 1476–1482. <https://doi.org/10.2105/AJPH.2006.101295>
- Robert, S. A., & House, J. S. (2000). *Socioeconomic inequalities in health: An enduring sociological problem*. In C. E. Bird, P. Conrad, A. Fremont, & S. Timmermans (Eds.). NJ: Prentice Hall.
- Roh, S., Jang, Y., Chiriboga, D. A., Kwag, K. H., Cho, S., & Bernstein, K. (2011). Perceived neighborhood environment affecting physical and mental health: A study with Korean American older adults in New York City. *Journal of Immigrant and Minority Health*, 13(6), 1005–1012. <https://doi.org/10.1007/s10903-011-9492-3>
- Ross, C. E., & Mirowsky, J. (2000). Does medical insurance contribute to socioeconomic differentials in health? *The Milbank Quarterly*, 78(2), 291–321. <https://doi.org/10.1111/1468-0009.00171>
- Rozanski, A., Blumenthal, J. A., Davidson, K. W., Saab, P. G., & Kubzansky, L. (2005). The epidemiology, pathophysiology, and management of psychosocial risk factors in cardiac practice: The emerging field of behavioral cardiology. *Journal of the American College of Cardiology*, 45(5), 637–651. <https://doi.org/10.1016/j.jacc.2004.12.005>
- Ryff, C., Almeida, D., Ayanian, J., Binkley, B., Carr, D., ... Williams, D. (2016). *Midlife in the United States (MIDUS Refresher)*, 2011–2014. ICPSR36532-v2. Ann Arbor, MI: Inter-university Consortium for Political and Social Research. <https://doi.org/10.3886/ICPSR36532.v2>
- Ryff, C. D., Miyamoto, Y., Boylan, J. M., Coe, C. L., Karasawa, M., Kawakami, N., & Kitayama, S. (2015). Culture, inequality, and health: Evidence from the MIDUS and MIDJA comparison. *Culture and Brain*, 3(1), 1–20. <https://doi.org/10.1007/s40167-015-0025-0>

- Sapolsky, R. M. (2004). Social status and health in humans and other animals. *Annual Review of Anthropology*, 33(1), 393–418.
<https://doi.org/10.1146/annurev.anthro.33.070203.144000>
- Sapolsky, R. M. (2005). The influence of social hierarchy on primate health. *Science*, 308(5722), 648–652. <https://doi.org/10.1126/science.1106477>
- Seeman, M. V., & Seeman, P. (2014). Is schizophrenia a dopamine supersensitivity psychotic reaction? *Progress in Neuro-Psychopharmacology & Biological Psychiatry*, 0. <https://doi.org/10.1016/j.pnpbp.2013.10.003>
- Shishido, K., Iwai, N., & Yasuda, T. (2009). Designing response categories of agreement scales for cross-national surveys in East Asia: The approach of the Japanese general social surveys. *International Journal of Japanese Sociology*, 18(1), 97–111. <https://doi.org/10.1111/j.1475-6781.2009.01111.x>
- Singh-Manoux, A., Adler, N. E., & Marmot, M. G. (2003). Subjective social status: its determinants and its association with measures of ill-health in the Whitehall II study. *Social Science & Medicine*, 56(6), 1321–1333.
[https://doi.org/10.1016/S0277-9536\(02\)00131-4](https://doi.org/10.1016/S0277-9536(02)00131-4)
- Smith, L. C., Amani, E. O., Jensen, H. H., & Johnson, S.R. (1998). The geography and causality of food insecurity in developing countries. In Johnson, S. R., Obeid, A. E., Jensen, H.H., & Smith, L. C (Ed.), *Food security: New solutions for the 21st century*. Ames, Iowa: Iowa State University Press.
- Sobal, J., & Stunkard, A. J. (1989). Socioeconomic status and obesity: A review of the literature. *Psychol Bull*, 105. <https://doi.org/10.1037/0033-2909.105.2.260>
- Son, M., Armstrong, B., Choi, J.-M., & Yoon, T.-Y. (2002). Relation of occupational class and education with mortality in Korea. *Journal of Epidemiology and Community Health*, 56(10), 798–799. <https://doi.org/10.1136/jech.56.10.798>
- Son, M., Cho, Y., Oh, J., Kawachi, I., Yi, J., & Kwon, S. (2012). Social inequalities in life expectancy and mortality during the transition period of economic crisis (1993–2010) in Korea. *International Journal for Equity in Health*, 11, 71.
<https://doi.org/10.1186/1475-9276-11-71>
- Subramanian, S. V., Davey Smith, G., & Subramanyam, M. (2006). Indigenous health and socioeconomic status in India. *PLoS Medicine*, 3(10), e421.
<https://doi.org/10.1371/journal.pmed.0030421>

- Tsuchiya, M., Kawakami, N., Ono, Y., Nakane, Y., Nakamura, Y., Tachimori, H., ... Kessler, R. C. (2009). Lifetime comorbidities between phobic disorders and major depression in Japan: Results from the World Mental Health Japan 2002–2004 Survey. *Depression and Anxiety*, 26(10), 949–955. <https://doi.org/10.1002/da.20508>
- Van Lenthe, F. J., Brug, J., & Mackenbach, J. P. (2005). Neighborhood inequalities in physical inactivity: The role of neighborhood attractiveness, proximity to local facilities and safety in the Netherlands. *Social Science & Medicine* (1982), 60(4), 763–775. <https://doi.org/10.1016/j.socscimed.2004.06.013>
- Walker, I., & Smith, H. J. (2002). *Relative deprivation: Specification, development, and integration*. Cambridge University Press.
- Wen, M., & Gu, D. (2011). The effects of childhood, adult, and community socioeconomic conditions on health and mortality among older adults in China. *Demography*, 48(1), 153–181. <https://doi.org/10.1007/s13524-010-0003-2>
- Wheaton, B., & Clarke, P. (2003). Space meets time: Integrating temporal and contextual influences on mental health in early adulthood. *American Sociological Review*, 68(5), 680–706. <https://doi.org/10.2307/1519758>
- Wilkinson, R.G. (1996). *Unhealthy societies: The afflictions of inequality*. London: Routledge.
- Wilkinson, R.G. (1999). Health, hierarchy, and social anxiety. In N. E. Adler, M. Marmot, B. S. McEwen, and J. Stewart (Eds.), *Socioeconomic status and health in industrial nations: Social, psychological, and biological pathways* (pp. 48–63). New York, NY: New York Academy of Sciences.
- Wilkinson, R. G. (2005). *The Impact of Inequality*. New York, NY: The New Press.
- Wilkinson, R. G., & Pickett, K. E. (2007). The problems of relative deprivation: Why some societies do better than others. *Social Science & Medicine*, 65(9), 1965–1978. <https://doi.org/10.1016/j.socscimed.2007.05.041>
- Williams, D. R. (1990). Socioeconomic differentials in health: A review and redirection. *Social Psychology Quarterly*, 53, 81–99.
- Williams, D. R. (1999). Race, socioeconomic status, and health: The added effects of racism and discrimination. *Annals of the New York Academy of Sciences*, 896, 173–188.
- Williams, D. R., & Collins, C. (1995). U.S. socioeconomic and racial differences in health: Patterns and explanations. *Annual Review of Sociology*. 21:349–386.

- Wolf, M., Barzillai, M., Gottwald, S., Miller, L., Spencer, K., Norton, E., ... Morris, R. (2009). The RAVE-O Intervention: Connecting neuroscience to the classroom. *Mind, Brain, and Education*, 3(2), 84–93. <https://doi.org/10.1111/j.1751-228X.2009.01058.x>
- Wright, C. E., & Steptoe, A. (2005). Subjective socioeconomic position, gender and cortisol responses to waking in an elderly population. *Psychoneuroendocrinology*, 30. <https://doi.org/10.1016/j.psyneuen.2005.01.007>
- Yamaoka, K. (2008). Social capital and health and well-being in East Asia: A population-based study. *Social Science & Medicine*, 66(4), 885–899. <https://doi.org/10.1016/j.socscimed.2007.10.024>
- Yamazaki, S., Fukuhara, S., & Suzukamo, Y. (2005). Household income is strongly associated with health-related quality of life among Japanese men but not women. *Public Health*, 119. <https://doi.org/10.1016/j.puhe.2004.07.014>
- Yu, S. M., Huang, Z. J., Schwalberg, R. H., Overpeck, M., & Kogan, M. D. (2003). Acculturation and the health and well-being of U.S. immigrant adolescents. *Journal of Adolescent Health*, 33(6), 479–488. [https://doi.org/10.1016/S1054-139X\(03\)00210-6](https://doi.org/10.1016/S1054-139X(03)00210-6)
- Yu, Y., & Williams, D. R. (1999). Socioeconomic status and mental health. In C. S. Aneshensel & J. C. Phelan (Eds.), *Handbook of the Sociology of Mental Health* (pp. 151–166). Springer US. https://doi.org/10.1007/0-387-36223-1_8
- Zink, C. F., Tong, Y., Chen, Q., Bassett, D. S., Stein, J. L., & Meyer-Lindenberg, A. (2008). Know your place: Neural processing of social hierarchy in humans. *Neuron*, 58(2), 273–283. <https://doi.org/10.1016/j.neuron.2008.01.025>