

Parental Education and Self-Rated Health among Older Adults: Evidence from the U.S. and South Korea*

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The purpose of this cross-national study is to investigate the association between parental education, an important early-life socioeconomic indicator, and self-rated health (SRH) among older adults in Western (U.S.) and Eastern (Korea) countries. The study sample is drawn from nationally representative data collected by the 2016 Health and Retirement Study (HRS) and the 2016 Korean Longitudinal Study of Aging (KLoSA). The final sample consists of 9,610 HRS and 4,425 KLoSA respondents age 65 or older. Hierarchical logistic regression models are used to examine the association between paternal and maternal education and SRH. The results show that low maternal education is significantly associated with fair/poor SRH in the U.S., while low paternal education is associated with fair/poor SRH among older Korean adults, controlling for other covariates. The disparity found in parental education may be due to the cultural differences in patriarchal values and the rate of change in gender expectations and economic development.

Keywords: paternal education, maternal education, self-rated health, HRS, KLoSA

*This work was supported by the National Research Foundation of Korea Grant funded by the Korean Government (NRF-2012S1A6A3A01033504)

Introduction

Over the past few decades, scholars have begun to examine early-life origins of adult health and well-being. A growing number of studies suggest that childhood socioeconomic status (SES) has long lasting impacts on health outcomes such as functional limitations, morbidity, and self-rated health (SRH) (Ferraro, Schafer, and Wilkinson 2016; Guralnik et al. 2006; Luo and Waite 2005; Lyu and Agrigoroaei 2017; Lyu and Burr 2016; Turrell et al. 2007). Yet, there is an ongoing discourse on the mechanisms connecting early life factors to adult health.

The link between early life experiences and health outcomes later in life has been examined within the life course perspective (Crosnoe and Elder 2004). Cohen et al. (2010) found that children raised in low SES families had increased exposure to adverse physical and psychosocial environments, and the longer the exposure the greater the health risks. In addition, Crosnoe and Elder (2004) noted that parents' education is a key factor associated with children's future education and occupation—two well-known factors positively related to health in adulthood. However, this pattern of results has been largely grounded in research from the U.S. and other Western countries and may not be applicable in Eastern societies such as Korea.

This study investigates the association between parental education, an indicator of childhood SES, and SRH in U.S. and Korean adults over the age of 65. While both the United States and Korea have undergone changes in recent decades (e.g., aging population, increasing levels of education, and growing health expenditure) many of those changes occurred earlier and over a longer time horizon in the U.S. For example, in Korea, formal education was introduced in the 1910s but not well established until 1959, which likely means older Koreans are less educated than Americans of the same age. Moreover, Korea has historically valued collectivism within a patriarchal society while the United States has emphasized individualism, which may mean a larger gender gap in education and employment among older cohorts in Korea than in the U.S. This cross-national comparison provides an interesting case in which we can gain additional insights into whether the relationship between childhood SES and later health may vary by cultural context, including gender role expectations.

In addition, Korea has experienced significant constant increases in health expenditure since 2003, rising from only 4.6% of GDP to 8.1% in 2018. Under the current government's ongoing policy to increase health coverage

for Koreans, health expenditure is projected to grow, with funding largely from public sources. In the U.S., however, health expenditure to GDP has remained consistent at around 16.9% since 2003 (OECD 2019). Moreover, SRH inequality was notable between the two countries. In 2017, over 80% of older Koreans rated their health as fair/bad/very bad, while only little over 20% of Americans considered themselves to be in that group. In fact, Korea was the worst country in Asia in terms of SRH, whereas the U.S. is ranked as having one of the highest levels of average SRH in the world (OECD 2019). In order to reduce the burden of spending on health and health inequality among older adults across nations, this study offers further insights into whether early life factors such as parental education affects SRH in later life.

Using harmonized, nationally representative data from the Health and Retirement Study (HRS) and the Korean Longitudinal Study of Aging (KLoSA), this cross-national comparison investigates the dynamic processes between early life SES and later life health in two different cultural contexts. Specifically, the aim of this research is to test the relationship between SRH among those over the age of 65 in the U.S. and Korea, and childhood SES as measured by both their mother's and father's formal education.

Literature Review

Growing interest in maintaining health as people age has led to an increase in research on the determinants of health status among older adults. Multiple factors have been identified as contributing to health status as measured by SRH including physical health, mental well-being, disability status, health-related behaviors, social connections, and sociocultural characteristics both in early and current life (French et al. 2012; Lee et al. 2017).

SRH has been shown to be an indicator of health in intra-country and cross-national research among older adults (French et al. 2012; Idler and Benyamini 1997). Yet, concurrent and historic factors coalesce to determine health status in adulthood (Link et al. 2017). Hence, as a subjective construct with interconnected contributory factors, SRH in older adults can be understood theoretically through the application of the life course perspective.

Life Course Perspective

The life course perspective provides a framework for understanding the relationships between indicators of health status from birth to death and the dynamic social factors that impact health throughout life (Alwin and Wray 2005; Crosnoe and Elder 2004). According to Crosnoe and Elder (2004), the life course perspective examines personal development from childhood through the end of life, and emphasizes personal development as a lifelong process that interacts with an individual's social environment.

Following from the life course perspective, health is understood by examining individual growth and development, as well as social and historical factors surrounding the individual (Dannefer and Kelley-Moore 2009). By integrating elements of a person's social environment, the life course perspective incorporates the dynamic processes between social status and health (Alwin and Wray 2005), which is useful in examinations of SES factors on SRH in later life.

The current investigation acknowledges the relationships between childhood SES and SRH adjusting for adult SES. Childhood SES, as assessed by both maternal and paternal education, is expected to be directly associated with mid-to-late life SRH. At the same time, we recognize that a respondent's own education may strengthen or weaken the childhood SES and SRH relationship. In recognition of the multiple factors associated with SRH in mid and late life, we also consider respondents' health conditions, disability status, labor force participation, marital status, and other socio-demographic characteristics.

Childhood Socioeconomic Status and Health

Studies in the U.S. and other Western countries have indicated that childhood SES is associated with SRH later in life (Birnie et al. 2011; Luo and Waite 2005). Early economic problems, parental education level, as well as respondents' own levels of education have been identified as significant predictors of SRH among three cohorts of Finnish adults (Rahkonen, Lahelma, and Huuhka 1997). Moody-Ayers et al. (2007) found that parental education level was the main predictor of SRH and functional limitation among people age 50 and over. In fact, parental education level is less likely to change compared with other SES indicators such as occupation or income. Also, parental education is an important resource of the socioeconomic

circumstances of a household and the education of children within it because higher levels of educational attainment are strongly associated with higher incomes and education levels in children (Chittleborough, Baum, Taylor, and Hiller 2006). Therefore, parental education is a relatively stable childhood SES indicator (Chittleborough et al. 2006) that has a long-term impact on health (Case, Fertig, and Paxson 2005). Yet, educational standards have changed across generations according to social policy, economic development, and societal gender expectations, which in turn may diminish or enhance the importance of mother's and father's education on the lives of their sons and daughters.

In prior studies where parental education level was used as one of the childhood SES factors, researchers operationalized parental education differently. Some studies used only paternal education (Ferraro, Schafer, and Wilkinson 2016; Jun and Kim 2013) because paternal education and maternal education were highly correlated. Other studies used maternal education (Guralnik et al. 2006; O'Rand and Hamil-Luker 2005) only when paternal occupation was used as another indicator of childhood SES. Studies using paternal and maternal education highlighted that both measures were useful due to research findings indicating father's education and mother's education had separate effects on later health outcomes (Kaplan et al. 2001; Lyu and Burr 2016; Sheikh, Abelsen, and Olsen 2014). According to Cohen et al. (2010), the impact of a mother's education may be stronger than that of a father's because mothers play a significant role in providing custodial care, emotional support, and healthy lifestyles which are related to health outcomes.

Nonetheless, the influence of parental education level on health later in life may differ according to culture and broader social context. In a more developed country like the U.S., less than eight years of education is often considered a low level of parental education (Luo and Waite 2005). In contrast, a complete lack of education is considered a low level of parental education in Korea (Jun and Kim 2013), where formal education was introduced much later. Historically, Korea underwent Japanese colonization (1910-45) and the Korean War (1950-53) during which the parents' cohort was born. Only 30% of all school-age children were accepted to elementary schools and opportunities for higher education were more limited under Japanese colonial rule (Balatchandirane 2003). Cultural gender roles are also likely to affect participation in education. Traditionally in Korea, education is prioritized for sons due to their key role as continuers of the family line (Burt and Park 2008). Due to the historical and sociocultural differences in

education, it is not surprising that educational attainment is lower among the older birth cohort in Korea relative to the same cohort in the U.S., and that younger generations are obtaining higher levels of education than older generations. Only 11% of Korean women aged 55-64 hold a tertiary qualification, the third lowest rate among all OECD countries, while the U.S. ranks number three with 42%. About a quarter of Korean men aged 55-64 hold a tertiary qualification, ranking 16th out of all 35 OECD countries, while the U.S. again ranks third with 41% (OECD 2015).

Cross-National Studies

International studies examining SES and SRH have shown differences between countries, although it is important to note there has been limited cross-national research in this area. Alvarez-Galvez et al. (2013) examined the association between SES and SRH among 29 European countries, and identified regional differences in the impact of various measures of SES on SRH. The findings indicated that education was a factor contributing to SRH in southern, eastern, and Scandinavian countries, but that unlike the other two regions, occupation was not a significant factor in southern Europe.

Hanibuchi, Nakaya, and Murata (2012) conducted a cross-national study among four East Asian countries: Korea, Taiwan, China, and Japan. The results of the study indicated that both education and income were associated with SRH in Korea, China, and Taiwan, while occupational status showed no effect. To date, these cross-national studies have been largely based on comparisons within Western or Eastern cultures, yet education level as an indicator of SES has been a consistent factor for SRH.

To the best of the authors' knowledge, there have been no cross-national studies comparing the U.S. and Korea using nationally representative data to investigate the relationship between childhood SES and SRH in late life. Although studies focused on the impact of childhood SES on health later in life have been conducted largely within Western countries, recently initiated national studies have made such research possible in the East.

Cross-national studies which include countries representing Eastern and Western cultures may be beneficial in two ways. Investigation of life course SES factors and their relationship to SRH among people over the age of 65 in various cultures can add to the existing knowledge about factors shaping health globally. Knowing more about the similarities and differences between Western countries, like the U.S., and East Asian countries, such as Korea, will aid in our understanding of both cultures and the factors that shape SRH.

Second, the world's population is aging, and international studies that take into account countries in different stages of development can help inform policy or supply social implications for the health of increasingly diverse older populations.

The Health and Retirement Study (HRS) and the Korean Longitudinal Study of Aging (KLoSA) both provide parental education levels as a childhood indicator of SES and additional factors related to health and wellbeing later in life. Using these nationally representative data sources, this study investigates the relationship between SRH in adults 65 and older and childhood SES measured by both mother's and father's formal education in the U.S. and Korea.

Methods

Study Sample

Datasets for this study are from the Health and Retirement Study (HRS) and the Korean Longitudinal Study of Aging (KLoSA). The HRS is a nationally representative survey of persons aged 51 and older conducted by the University of Michigan and funded by the National Institute on Aging, with supplemental support from the Social Security Administration. The HRS is a biennial longitudinal panel study of the economic, health, marital, and family status, as well as public and private support systems of community-dwelling older adults in the United States, with oversamples of Black and Hispanic populations (Servais 2010). Additional information about the survey can be found at <http://hrsonline.isr.umich.edu>.

The KLoSA is one of the international sister studies of the HRS which enables cross-national study harmonization (<https://survey.keis.or.kr/klosa/klosa01.jsp>). The KLoSA is conducted and funded by the Korea Employment Information Service. It includes the community-dwelling population who are 45 and older and collects information on demographics, family, health, employment, income, assets, subjective expectations, and satisfaction. In 2016, there were 20,918 respondents in the HRS and 7,490 respondents in the KLoSA. After listwise deletion, the final sample includes 9,610 persons from the 2016 HRS and 4,425 persons from the 2016 KLoSA who are 65 and older.

Measures

Dependent Variables. Respondents were asked to rate their subjective health status as excellent, very good, good, fair, or poor. Self-rated health was used as a dependent variable in the present study and dichotomized as (1=fair/poor health, 0=otherwise).

Independent Variables. Paternal and maternal education were examined as categorical dummy variables (1=any education (reference), 2=no education, and 3=missing) (e.g., Jun and Kim 2013; Lyu and Burr 2016). A substantial proportion of values for father's education and mother's education were missing in HRS, 16.5% and 9.6% respectively. Missing cases were relatively fewer in KLoSA, with 2.1% of father's education and 1.6% of mother's education missing. A dichotomous variable was used to identify this item non-response rather than exclude them from the analysis. The information on parental education was collected when respondents first entered the surveys.

Covariates. In this study, age (in years), gender (1=female, 0=male), marital status (1=married, 0=otherwise) were included as socio-demographic factors. The respondent's education (1=less than high school (reference), 2=high school graduate, and 3=college and above) and household income (in quartiles; 1=lowest group, 2=medium lowest, 3=medium highest, and 4=highest group) were included as adult SES factors. In KLoSA, the original educational attainment was coded only in categories. For missing data on income in KLoSA, multiple imputed values generated by the KLoSA research group were used (Song et al. 2007). The RAND household income variable was used for HRS because it included imputed values for income (St. Clair et al. 2011).

Disability status was measured with Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) limitations. The disability count variable ranges from 0 (no difficulties) to 7 (maximum number of difficulties with dressing, bathing, eating, toileting, using a telephone, taking medication, and handling money). Comorbidity was measured with physician-diagnosed chronic conditions (i.e., high blood pressure, heart disease, and stroke). The comorbidity count variable thus ranges from 0 to 3. Smoking status was coded as (1=never smoker (reference), 2=former smoker, and 3=current smoker). Drinking status was dichotomized as (1= current

drinker, 0=otherwise) based on the respondent's drinking behavior.

Physical activity was dichotomized as (1=regular exercise, 0=otherwise) if respondents were engaging in physical activity more than once a week. In HRS, body mass index (BMI) was categorized into underweight (BMI less than 18.5 kg/m²), normal weight (reference group; 18.5 to 25 kg/m²), overweight (25 to 30 kg/m²), and obese (greater or equal to 30 kg/m²). Asian standard of BMI (normal weight range of 18.5 to 23 kg/m²) was used in KLoSA (WHO 2000).

Statistical Analysis

The descriptive statistics were presented first to show characteristics of dependent and independent variables by providing means (M) and standard deviations (SD) for continuous variables, and the frequencies and percentages (%) for categorical variables.

The logistic regression analyses were conducted to investigate the association between parental education and SRH while controlling for other covariates. Statistical country differences in the relationship between parental education and SRH were also evaluated. All statistical analyses were carried out based on the suggested sampling weight, using SPSS version 25.

Results

Descriptive Statistics

Table 1 includes descriptive statistics for the study sample in the HRS and KLoSA. Respondents with fair/poor SRH made up 27.9% of the U.S. sample and 34.5% of the Korean sample. The mean age was about 74.5 years for the U.S. sample and 73.9 years for the Korean sample. For both countries, more than half of the subjects were women (U.S.: 55.7%, Korea: 55.8%). About 59.7% of older Americans and 68.7% of older Koreans were married.

A notable difference in parental education was observed. Only 2.5% of U.S. fathers and 2.6% of U.S. mothers received no formal education, compared to more than half of Korean parents who did not receive any formal education (fathers: 64.6%, mothers: 80.5%). In addition, respondents' own education levels also differed. Only about 14.7% of U.S. respondents had less than high school education, whereas nearly two thirds of Korean respondents had the same level of education. About one third of U.S

respondents were high school graduates and nearly a quarter of older Koreans hold the same level of education. In terms of higher education, 51.9% of U.S. respondents and only 8.2% Korean respondents held college degrees or higher. Another difference was found in household income. The median household income was much higher for Americans than Koreans.

TABLE 1
SAMPLE CHARACTERISTICS OF U.S. AND KOREAN OLDER ADULTS

	HRS (N=9,610)		KLoSA (N=4,425)		p-value ^a
	Mean (%)	S.D.	Mean (%)	S.D.	
<i>Dependent Variable</i>					
Fair/Poor self-rated health	27.9%		34.5%		<.001
<i>Independent Variables</i>					
Father's education					<.001
Any education (Ref.)	83.6%		33.3%		
No education	2.5%		64.6%		
Missing	13.9%		2.1%		
Mother's education					<.001
Any education (Ref.)	89.3%		17.9%		
No education	2.6%		80.5%		
Missing	8.2%		1.7%		
<i>Covariates</i>					
Age (in years)	74.5	7.8	73.9	7.0	.298
Female	55.7%		55.8%		.146
Married	59.7%		68.7%		<.001
Education					<.001
Less than high school (Ref.)	14.7%		68.7%		
High school graduate	33.3%		23.1%		
College or above	51.9%		8.2%		
Household Income (US \$, median) ^b	\$42,297		\$15,720		<.001
Disability (count) ^c	0.5	1.3	0.3	1.2	<.001
Comorbidity (count) ^d	1.1	0.8	0.7	0.7	<.001
Smoking status					<.001
Never smoker (Ref.)	44.6%		67.6%		
Former smoker	47.2%		23.2%		
Current smoker	8.2%		9.3%		

Current drinker	37.8%	28.9%	<.001
Physical activity ^e	44.6%	35.4%	<.001
BMI			<.001
Underweight	2.1%	4.6%	
Normal weight (Ref.)	28.8%	42.7%	
Overweight	38.5%	27.9%	
Obese	30.6%	24.8%	

^aT-test for continuous variables; chi-square test for categorical variables.

^bKRW 15,720,000 in KLoSA (USD 1=KRW 1,000)

^cDisability items include dressing, bathing, eating, toileting, using a telephone, taking medication, and handling money.

^dComorbidity items include high blood pressure, heart disease, and stroke.

^eEngaging in physical activity more than once a week.

Hierarchical Logistic Regression Results

Table 2 shows the hierarchical logistic regression results for the HRS and KLoSA samples. Model 1 only controls for parental education and Model 2 adjusts for all other covariates. The results in Model 1 shows that parental education was significantly associated with SRH in the U.S., while only paternal education was significantly associated with SRH in Korea. After controlling for all other covariates, this association was weakened in both countries. In Model 2, only maternal education was significantly associated with SRH in the U.S., while only paternal education was significantly associated with SRH in Korea. Compared to respondents who had a mother with any formal education, respondents who had a mother with no education (OR=1.76, $p<.01$) had increased likelihood of fair/poor SRH in the U.S. This association is statistically significantly different between the two countries ($p=.001$). In Korea, those who had a father with no education had increased likelihood of fair/poor SRH compared to those who had a father with any formal education (OR=1.26, $p<.05$).

TABLE 2
HIERARCHICAL REGRESSION RESULTS FOR PARENTAL EDUCATION ON SRH IN U.S.
AND KOREA

	HRS (N=9,610)	KLoSA (N=4,425)	
	Odds Ratio (95% CI)	Odds Ratio (95% CI)	p-value ^b
<u>Model 1^a</u>			
<i>Independent Variables</i>			
Father's education			
Any education (Ref.)			
No education	2.42 (1.78, 3.28)***	1.63 (1.37, 1.93)***	.091
Missing	1.54 (1.33, 1.78)***	1.87 (1.08, 3.25)*	.540
Mother's education			
Any education (Ref.)			
No education	2.61 (1.93, 3.53)***	1.06 (.86, 1.31)	.009
Missing	1.58 (1.32, 1.88)***	.92 (.48, 1.74)	.185
<u>Model 2</u>			
<i>Independent Variables</i>			
Father's education			
Any education (Ref.)			
No education	1.37 (.97, 1.94)	1.26 (1.04, 1.53)*	.686
Missing	1.20 (1.02, 1.41)	1.21 (.64, 2.26)	.984
Mother's education			
Any education (Ref.)			
No education	1.76 (1.24, 2.48)**	.80 (.62, 1.01)	.001
Missing	1.21 (.99, 1.48)	.87 (.42, 1.79)	.400
<i>Covariates</i>			
Age	.99 (.98, .99)***	1.03 (1.02, 1.04)***	.000
Female	.87 (.78, .97)*	1.04 (.84, 1.30)	.162
Married	1.24 (1.09, 1.40)**	.83 (.70, .99)*	.001
Education			
Less than high school (Ref.)			
High school graduate	.64 (.55, .74)***	.75 (.62, .92)**	.215
College or above	.51 (.43, .59)***	.53 (.38, .75)***	.775

Household Income (in quartiles)			
Lowest group (Ref.)			
Medium lowest	.76 (.65, .87)***	.69 (.58, .82)***	.444
Medium highest	.49 (.41, .58)***	.61 (.50, .74)***	.116
Highest group	.43 (.35, .52)***	.58 (.45, .74)***	.078
Disability	1.59 (1.52, 1.66)***	1.66 (1.50, 1.83)***	.468
Comorbidity	1.61 (1.51, 1.72)***	1.93 (1.74, 2.14)***	.007
Smoking status			
Never smoker (Ref.)			
Former smoker	1.18 (1.05, 1.32)**	1.45 (1.16, 1.82)**	.120
Current smoker	1.42 (1.18, 1.72)***	1.34 (1.00, 1.80)	.737
Current drinker	.64 (.57, .72)***	.59 (.49, .71)***	.444
Physical activity	.56 (.50, .63)***	.53 (.45, .62)***	.562
BMI			
Normal weight (Ref.)			
Underweight	1.40 (.99, 1.96)	2.12 (1.51, 2.98)***	.104
Overweight	.86 (.75, .98)*	.80 (.67, .96)*	.542
Obese	1.09 (.95, 1.26)	.90 (.75, 1.08)	.104
-2 Loglikelihood	9168.89	4683.22	

^a Model 1 assesses whether parental education predicts SRH. Model 2 controls for all factors simultaneously.

^b P value of t-statistics comparing coefficients between US and Korea

CI = Confidence Interval, Ref = Reference group. *p<.05, **p<.01, ***p<.001

Discussion

Cross-national studies investigating the relationship between early life SES and later life health have been limited. In this study, we found that both paternal and maternal education were associated with SRH in the U.S. while only paternal education was significant in Korea using nationally representative samples from the HRS and KLoSA. Adjusting for adult sociodemographic characteristics and health behaviors attenuated the association between father's education and SRH, making it no longer statistically significant in the U.S. In contrast, adjusting for adult socio-demographic characteristics and health behaviors resulted in only small changes in the associations between paternal education and SRH, and it still remained significant in Korea. The findings suggest that parental education has different impacts on SRH in the U.S. and in Korea.

The association between the education level of an individual's father and later health was significant in both countries (when other factors were not considered), and this finding confirms previous findings (Luo and Waite 2005; Lyu and Burr 2016). Specifically, having missing values for paternal education could indicate that the respondents were fatherless, and this was significantly associated with SRH among U.S. adults. Families without fathers are likely to have less access to economic resources, are less stable in terms of residence, may live closer to environmental hazards, may go to poorer quality schools, and have less access to health care, all of which have negative impacts on health outcomes.

Maternal education was significantly associated with later health only among Americans even after controlling for other factors, and this finding was consistent with studies of other developed countries (Cutler, Deaton, and Lleras-Muney 2006; Kaplan et al. 2001; Kestilä et al. 2006; Wadsworth and Kuh 1997). As primary caretakers, educated mothers often have access to more resources and implement healthy behaviors that can have a positive influence on their children's health (Cutler et al. 2006). Moreover, due to mothers' prominent role as gatekeepers for their children's health, a mother's education can have long-term influence on health (Case et al. 2005).

The non-significance found in maternal education in Korea may be due to the cultural differences in patriarchy and the rate of change in gender expectations. Traditional Korean patriarchal ideology views "women as inferior and expects them to function only as homemakers and mothers" (Chung 1994, p. 487). Consequently, educational and occupational priorities have been given to men. Few women had any formal education due to limited opportunities related to traditional gender roles and discrimination. Therefore, the impact of maternal education may not be evident among older Korean cohorts.

It is not surprising that the mothers in the Korean sample have relatively lower levels of education than in the American sample. Though women have historically faced discrimination relative to men and confronted traditional gender role expectations, economic opportunities and social changes providing women more educational opportunities arrived at an earlier time period in the U.S. Though hardly egalitarian and more available to white women, American women by in large had earlier access to public education and university than did women in Korea.

In addition, the findings were consistent with a study on the effects of parental education on children's health. According to Chen, Martin, and Matthews (2006), parental education had a significant impact on children's

health among non-Hispanic white communities and Black communities, but no effect on Asian-Americans. Since white people and Asians have different lifestyles because of cultural norms, the formal education of parents might play less of a role in Asian-American families.

We were not entirely surprised to find differences in the effect of childhood SES on SRH later in life in the U.S. and Korea. After all, the impact of education differs between countries with respect to the flexibility of the economy and to welfare provisions (Alvarez-Galvez et al. 2013). Since the U.S. and Korea had different educational systems for a long period of time, this might have led to significant differences in the role of parental education on SRH. It will be interesting to view these findings over time as future research investigates these relationships among more recent birth cohorts in Korea.

Though it is foreseeable that younger birth cohorts, particularly in Korea, will on average have higher levels of formal education than their predecessors, it is beyond the scope of this study to speculate about the changes these educational differences may have on childhood SES and the value of parental education to SRH over an individual's life course. Still, future research should continue to examine early-life SES factors on health as people move into mid and later life in Korea, especially given the rapid economic and technological changes likely driving current educational and lifestyle expectation. Moreover, since family structures and gender norms are not completely constant over time, we join other scholars in recommending that future investigations take into account both maternal and paternal education on children's SRH as they age (Kaplan et al. 2001; Lyu and Burr 2016; Sheikh et al. 2014).

This study has a number of limitations. First, as with any secondary data analysis, we were constrained by the existing data. Although childhood SES can be measured with several other indicators (e.g., father's occupation, financial well-being at childhood), we could not examine these with both the HRS and KLoSA datasets. Given the categorized measure of parental education in the KLoSA, we could not examine education level in more detail.

In addition, childhood family structure could not be explored in this study. Neither available data source (HRS and KLoSA) provided information about whether respondents were raised in two-parent or lone-parent households. The availability of more than one parent within a household can have a substantial influence on resources, and given the correlations between education and rates of marriage and divorce (Park and Raymo 2013), it is

likely that a measure of family structure could have contributed to our study. In part we captured this by including a missing category in both mother's and father's parental education variable; about 50% of the missing cases were due to a missing parent (Lyu and Burr 2016). Still, future research should consider family structural history when investigating childhood SES influences on later-life health.

Another limitation of this study concerns the use of retrospective reports. The current study relies on respondents' retrospective reports on the level of education attained by their mothers and fathers. Ideally, cross-generational information about parents and children would allow for more precise educational information as well as other SES factors that may have influenced respondents' health.

Despite these limitations, this study makes a number of important contributions. We utilize the harmonized datasets to make cross-country comparisons between Korea and the U.S. The availability of this data allows for the use of comparable variables collected over the same time period to be used in the analysis. In addition, the nationally representative samples in both the U.S. and Korea are used in order to make inferences about the populations over the age of 65 in both countries. By examining both maternal and paternal education in relation to SRH, the findings identify the significant differences of parental education in Korea and the U.S. Specifically, this study suggests that SRH in later life can be modifiable through education of fathers in Korea and education of mothers in the U.S., both of which are beyond the scope of individual (i.e., child) choices. Therefore, public health education and promotion initiatives should be considered for those children who have fewer chances to receive maternal support in Korea and paternal support in the U.S. In the long run, effective early interventions in the life course should be implemented to benefit population health.

In conclusion, this study adds to the evidence of the long-term effect of childhood SES on later health. Importantly, we find that the relationship is unique and country specific. In order to maximize the well-being of older adults in an aging global society, each country should improve social and economic circumstances from childhood with a special emphasis on education. Through promoting policies that educate citizens early in life, countries can help foster populations that age healthily.

References

- Alvarez-Galvez, Javier, Rodero-Cosano, Maria L., Motrico, Emma, Salinas-Perez, Jose A., Garcia-Alonso, Carlos, and Salvador-Carulla, Luis. 2013. "The impact of socio-economic status on self-rated health: Study of 29 countries using European Social Surveys (2002-2008)." *International Journal of Environmental Research and Public Health* 10: 747-761.
- Alwin, Duane F. and Wray, Linda A. 2005. "A life-span developmental perspective on social status and health." *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 60 (Special Issue 2): S7-S14.
- Balatchandirane, Govindasamy. 2003. "Gender discrimination in education and economic development: A study of South Korea, China and India." *International Studies* 40(4): 349-378.
- Birnie, Kate, Cooper, Rachel, Martin, Richard M., Kuh, Diana, Sayer, Avan A., and Alvarado, Beatriz E., et al. 2011. "Childhood socioeconomic position and objectively measured physical capability levels in adulthood: A systematic review and meta-analysis." *PLoS One* 6(1): e15564.
- Burt, Matthew E. and Park, Namgi. 2008. "Education inequality in the Republic of Korea: Measurement and causes." Pp. 261-289, in *Inequality in Education*. Dordrecht: Springer.
- Case, Anne, Fertig, Angela, and Paxson, Christina. 2005. "The lasting impact of childhood health and circumstance." *Journal of Health Economics* 24(2): 365-389.
- Chen, Edith, Martin, Andrew D., and Matthews, Karen A. 2006. "Understanding health disparities: The role of race and socioeconomic status in children's health." *American Journal of Public Health* 96: 702-708.
- Chittleborough, Catherine R., Baum, Fran E., Taylor, Anne W., and Hiller, Janet E. 2006. "A life-course approach to measuring socioeconomic position in population health surveillance systems." *Journal of Epidemiology and Community Health* 60(11): 981-992.
- Chung, Ji-Sun. 1994. "Women's unequal access to education in South Korea." *Comparative Education Review* 38(4): 487-505.
- Cohen, Sheldon, Jankcki-Deverts, Denise, Chen, Edith, and Matthews, Karen A. 2010. "Childhood socioeconomic status and adult health." *Annals of the New York Academy of Sciences* 1186: 37-55.
- Crosnoe, Robert and Elder, Glen H. 2004. "From childhood to the later years: pathways of human development." *Research on Aging* 26: 623-654.
- Cutler, David, Deaton, Angus, and Lleras-Muney, Adriana. 2006. "The determinants of mortality." *The Journal of Economic Perspectives* 20(3): 97-120.
- Dannefer, Dale and Kelly-Moore, Jessica A. 2009. Theorizing the life course: New twists in the path. Pp. 389-412, in *Handbook of Theories of Aging* (second edition), edited by Bengtson Vern, Gans Daphna, Putney Norella, and Silverstein

- Merrill. New York: Academic Press.
- Ferraro, Kenneth F., Schafer, Markus H., and Wilkinson, Lindsay R. 2016. "Childhood disadvantage and health problems in middle and later life: Early imprints on physical health?" *American Sociological Review* 81(1): 107-133.
- French, Davina J., Browning, Colette, Kendig, Hal, Luszcz, Mary A., Saito, Yasuhiko, Sargent-Cox, Kerry, and Anstey, Kaarin J. 2012. "A simple measure with complex determinants: Investigation of the correlates of self-rated health in older men and women from three continents." *BMC Public Health* 12(1): 649.
- Guralnik, Jack M., Butterworth, Suzanne, Wadsworth, Michael E. J., and Kuh, Diana. 2006. Childhood socioeconomic status predicts physical functioning a half century later. *Journal of Gerontology Series A: Biological Sciences and Medical Sciences* 61A: 695-701.
- Hanibuchi, Tomoya, Nakaya, Tomoki, and Murata, Chiyo. 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.
- Idler, Ellen L. and Benyamini, Yael. 1997. "Self-rated health and mortality: A review of twenty-seven community studies." *Journal of Health and Social Behavior* 38(1): 21-37.
- Jun, Heyjung and Kim, Myoung-Yong. 2013. (In Korean) "Childhood socioeconomic risk factors and depression in old age: A latent class analysis." *Journal of the Korean Gerontological Society* 33(2): 439-460.
- Kaplan, George A., Turrell, Gavin, Lynch, John W., Everson, Susan A., Helkala, Eeva-Liisa, and Salonen, Jukka T. 2001. "Childhood socioeconomic position and cognitive function in adulthood." *International Journal of Epidemiology* 30: 256-263.
- Kestilä, Laura, Koskinen, Seppo, Martelin, Tuija, Rahkonen, Ossi, Pensola, Tiina, Aro, Hillevi, and Aromaa, Arpo. 2006. "Determinants of health in early adulthood: What is the role of parental education, childhood adversities and own education?" *The European Journal of Public Health* 16(3): 305-314.
- Lee, Jiae, Cho, Sung-Il, Chun, Heeran, Jung-Choi, Kyunghee, Kang, Minah, and Jang, Soong-Nang. 2017. "Life course indices for social determinants of self-rated health trajectory in Korean elderly." *Archives of Gerontology and Geriatrics* 70: 186-194.
- Link, Bruce G., Susser, Ezra S., Factor-Litvak, Pam, March, Dana, Kezios, Katrina L., Lovasi, Gina S., Rundle, Andrew G., Suglia, Shakira F., Fader, Kim M., Andrews, Howard F., Johnson, Eileen, Cirillo, Piera M., and Cohn, Barbara A. 2017. "Disparities in self-rated health across generations and through the life course." *Social Science & Medicine* 174: 17-25.
- Luo, Ye and Waite, Linda J. 2005. The impact of childhood and adult SES on physical, mental, and cognitive well-being in later life. *Journal of Gerontology: Social Sciences* 60B(2): S93-S101.
- Lyu, Jiyoung and Agrigoroaei, Stefan. 2017. "Childhood misfortune and adult health

- in a national study: The meditational role of the quality of social relations." *The International Journal of Aging and Human Development* 84(3): 213-230.
- Lyu, Jiyoung and Burr, Jeffrey A. 2016. "Socioeconomic status across the life course and cognitive function among older adults: An examination of the latency, pathways, and accumulation hypotheses." *Journal of Aging and Health* 28(1): 40-67.
- Moody-Ayers, Sandra, Lindquist, Karla, Sen, Saunak, and Covinsky, Kenneth E. 2007. "Childhood social and economic well-being and health in older age." *American Journal of Epidemiology* 166(9): 1059-1067.
- OECD. 2015. "Educational attainment and labour-force status." Retrieved November 7, 2019 (<http://stats.oecd.org>).
- OECD. 2019. "Health at a Glance 2019: OECD Indicators." Retrieved November 7, 2019 (<http://www.oecd-library.org>).
- O'Rand, Angela M. and Hamil-Luker, Jenifer. 2005. "Processes of cumulative adversity: Childhood disadvantage and increased risk of heart attack across the life course." *Journal of Gerontology* 60B (Special Issue): S117-S124.
- Park, Hyunjoon and Raymo, James M. 2013. "Divorce in Korea: Trends and educational differentials." *Journal of Marriage and Family* 75(1): 110-126.
- Rahkonen, Ossi, Lahelma, Eero, and Huuhka, Minna. 1997. "Past or present? Childhood living conditions and current socioeconomic status as determinants of adult health." *Social Science & Medicine* 44(3): 327-336.
- Servais, Marita A. 2010. *Overview of HRS public data files for cross-sectional and longitudinal analysis*. Ann Arbor: Survey Research Center, Institute for Social Research, University of Michigan.
- Sheikh, Mashhood A., Abelsen, Birgit, and Olsen, Jan A. 2014. "Role of respondents' education as a mediator and moderator in the association between childhood socio-economic status and later health and wellbeing." *BMC Public Health* 14(1): 1172.
- Song, Juwon, Lee, Soo Young, Yoon, Chorong, et al. 2007. "Multiple imputation for missing data in the KLoSA Study." *Journal of The Korean Data Analysis Society* 9(5): 2085-2095.
- St. Clair, Patricia, Bugliari, Delia, Campbell, Nancy, Chien, Sandy, Hayden, Orla, Hurd, Michael, et al. 2011. *RAND HRS data documentation, version L*. Santa Monica: Labor & Population Program, RAND Center for the Study of Aging.
- Turrell, Gavin, Lynch, John W., Leite, Claudia, Raghunathan, Trivellore, and Kaplan, George A. 2007. "Socioeconomic disadvantage in childhood and across the life course and all-cause mortality and physical function in adulthood: Evidence from the Alameda County Study." *Journal of Epidemiology and Community Health* 61: 723-730.
- Wadsworth, Michael E. J. and Kuh, Diana. 1997. "Childhood influences on adult health: A review of recent work from the British 1946 national birth cohort study, the MRC National Survey of Health and Development." *Pediatric and*

Perinatal Epidemiology 11(1): 2-20.

WHO. 2000. "The Asia-Pacific perspective: redefining obesity and its treatment."
Retrieved November 7, 2019 (<https://apps.who.int/iris/handle/10665/206936>).

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