Social Science & Medicine 209 (2018) 76–85

Contents lists available at ScienceDirect

Social Science & Medicine

journal homepage: www.elsevier.com/locate/socscimed

Adult children's educational attainment and the cognitive trajectories of older parents in South Korea

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ARTICLE INFO

Keywords:
Education
Aging
Cognitive functioning
Gender
Intergenerational

ABSTRACT

Little is known about whether and how adult children's educational resources are associated with aging parents' cognitive changes over time. Using a nationally representative survey from the Korean Longitudinal Study of Aging (2006–2014), the current study examined three related questions: whether adult children's education is independently associated with parents' latent trajectory classes of cognitive functioning; whether this association is explained by behavioral, psychological, and financial pathways; and whether the association varies by the gender of the child. Adult children's education is negatively associated with the unfavorable cognitive functioning trajectories of parents. Children's education predicts parents' higher perceived life satisfaction and upward financial transfers, which are some of the pathways through which children's education appears to prevent subsequent cognitive impairment in parents. Sons' education matters more for preventing the onset of dementia, and daughters' educational resources are linked to the prevention of cognitive decline among parents.

1. Background

Health benefits from education appear to be transferable to others in the family network. Only recently, a small number of studies have found that adult children's schooling is positively related to their aging parents' health independent of the parents' own schooling attainment (Friedman and Mare, 2014; Torssander, 2013; Lee et al., 2017; De Neve and Harling, 2017; Yahirun et al., 2017). The mechanisms of this upward spillover require further investigation to understand the health inequalities among the elderly, particularly in societies where governmental support remains limited and transfers of resources from children are common (De Neve and Kawachi, 2017; De Neve and Harling, 2017). Another issue that has not been sufficiently addressed is how the contribution of children's education to the health of their aging parents varies by the gender of the child. Although previous studies found no statistically significant differences in the health benefits of the education of sons and daughters (Friedman and Mare, 2014; Torssander, 2013), these findings may not generalize to populations in non-Western societies where there are strong patrilineal norms and gender inequalities in economic returns to education.

This study extends previous research into South Korea (Korea hereafter), where older adults emphasize the role of family support in meeting their health care needs (Chung and Park, 2008). Although the proportion of the elderly is rapidly increasing and a surge of investment in higher education is already taking place in this society, how children's human capital translates into aging parents' health improvement, particularly cognitive health, has been less studied. Using the rich set of microdata on intergenerational relationships, this research aims to provide additional insights into the pathways through which children's schooling may slow the rate of cognitive decline among parents. We also examine whether this relationship varies by children's gender. A comprehensive understanding of the way children's education improves parents' cognitive functioning is important not only for revealing how individual well-being is shaped by the broader intergenerational environment but also for developing policies to address the increasing resources required to support aging populations.

1.1. Children's schooling and parental cognitive health

According to the social capital theory, network members' education may have a crucial impact on other members' health (Song and Chang, 2012). As children become important parts of their aging parents' social networks, parents are likely to draw upon children's educational resources to cope with their health problems. There are plausible pathways underlying the relationship between children's education and parental cognitive health. First, children influence parents' health-related behaviors and lifestyles through social control. Highly educated children have the ability to monitor parental health status and help them choose healthier behaviors (Torssander, 2013; Friedman and Mare, 2014) and utilize health care services, reducing the risks of cognitive impairment (Lee et al., 2010). For example, well-educated children utilize their knowledge to monitor their parents' cognitive

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https://doi.org/10.1016/j.socscimed.2018.05.026
Received 24 August 2017; Received in revised form 2 April 2018; Accepted 13 May 2018
Available online 17 May 2018

changes and encourage them to have proper screening tools for the early detection of dementia.

Highly-educated children are likely to promote positive features of intergenerational relations by providing better informal support for their parents. Therefore, parents with well-educated children may have higher levels of satisfaction with their relationship with children, which is positively associated with their cognitive functioning as it buffers against the psychological stress (Cheng and Chan, 2006; Lee et al., 2017). Social network theory suggests that the subjective social status of older adults who have experienced a decline in economic resources is likely to be influenced by the socioeconomic status (SES) of their family network's members (Goldman et al., 2006; Song, 2011). Children's educational achievement is likely to be valued as a symbolic asset and increase aging parents' perceived social standing. Parents who have less-educated children are likely to have lower subjective social status and higher levels of anxiety, which may induce physiological stress responses (Lee, 2017). Psychological distress and physiological arousal lead to memory impairments and cognitive decline (Juster et al., 2010). This psychological mechanism may be more important in an Asian context, where educational achievement is highly valued and supportive ties with children are considered essential factors of successful aging (Goldman et al., 2006; Chung and Park, 2008; Hsu and Wu, 2015).

Parents invest in children's human capital and share the economic returns to children's schooling in later life (Lillard and Willis, 1997). The size of children's compensation for parental human capital investment may depend on the amount of parental investment and/or need. Highly educated children are likely to acquire more prestigious occupations and incomes, which could provide additional health-related capital to parents. Children's economic resources are likely to be mobilized in times of need to offset aging parents' lack of resources. Extra resources provided by offspring matter more for parents who live in countries with limited public old-age support (Lillard and Willis, 1997; De Neve and Kawachi, 2017). Transferred wealth from children can be used to pay for health care services, home modifications, and other amenities that allow parents to maintain high-cognitive functioning. Children's resources may also serve the function of informal insurance for parents who are more susceptible to vascular dementia (e.g., parents with a history of stroke and cerebrovascular disease), who may need expensive diagnostic tools and non-covered medical treatments that facilitate therapeutic strategies for dementia (Battistin and Cagnin, 2010).

1.2. Korean context: old-age support and gender of the child

Korea is rapidly becoming an aged society and struggles with the increased demand for the resources required for old-age support (Rhee et al., 2015). The introduction of a national pension program lagged behind other developed countries, having only begun in 1988. Today's older adults are less likely to receive adequate pension benefits due to the relatively short period of time that they have had to pay their premiums. This immature public pension system has led to the highest rate of poverty being among individuals ages 65 and older in Korea; over 45% of these adults were living in poverty in 2011 (OECD, 2011). Although Korea has universal health coverage via the National Health Insurance program, the percentage of public expenditure on total health spending has been much lower than for other OECD countries (OECD, 2014). Furthermore, Korea does not have a federal health insurance program for the elderly that fills the same role as Medicare in the United States. Therefore, adult children's resources may play a crucial role in the lives of their elderly parents, particularly when parents have health problems.

Culturally-constructed gender norms shape children's caregiving responsibilities and behaviors (Silverstein et al., 2006). Research in Western countries has found that daughters are likely to be more responsive to parents' needs than sons, and daughters' resources are particularly important for parents with cognitive problems (Matthews, 2002; Bott et al., 2017). However, this finding may not be applicable to Korean society, where the patrilineal system has long been a key characteristic of the family structure. In this culture, parents invest more in sons than daughters, and sons are expected to give tangible support to their aging parents (Kim et al., 2015). Particularly, the oldest son is the inheritor and bears both the privilege and filial responsibility within a family; parents are most likely to move in with the oldest son and daughter-in-law (Lee et al., 1994). Around 49% of Korean parents aged 60 or over reported that they were living with their children and about 84% of them co-resided with their sons (KOSTAT, 2016). Given that sons are the central figures in the elderly's supportive networks, parents with highly educated sons may have lower psychological distress and higher subjective social status and thus experience a lower risk of cognitive impairment.

Strong patrilineal norms have led to the interruption of Korean women's careers upon marriage and childbearing (Brinton and Lee, 2016). Despite the reduced gender gap in college education, most Korean women still do not obtain the same level of economic reward as their men counterparts at a similar level of education (Qian and Sayer, 2015). A report in *The Economist* (2016) documented that Korea has the largest gender earning gap of their OECD counterparts. According to the Korean national statistics, only about 53% of working-aged women participate in the labor force, compared to 75% of men (KOSIS, 2016). Due to the gender inequalities in the labor market, daughters are less likely to be expected to provide material support to their parents (Kim et al., 2015). Recent statistics show that sons are more likely to provide intergenerational financial transfers to elderly parents than daughters do (34.5% vs. 4.6%; KOSIS, 2016). Korean employment-based health insurance includes older parents in the definition of ‘qualified dependents’, meaning that offspring with a stable occupation are capable of putting their parents on their health insurance plans, providing them with additional employer-sponsored health benefits (Cho et al., 2004). When parents have a risk factor for dementia, such as cardiovascular diseases, highly educated sons may be better able to help their parents obtain proper medical treatment by sharing their insurance premiums and providing monetary support than daughters.

1.3. Korean education system

Korea has a 6-3-3-4 educational system that consists of six years of elementary school, three years of middle school, three years of academic or vocational high school, and four years of tertiary school. Compulsory schooling was extended from six to nine years in 1985. Enrollment at each level of schooling rapidly increased, reaching around 90% for elementary school in the 1960s, similar levels for middle school in the early 1990s and then for high school in the mid-2000s for both sexes (KEDI, 2010). Many Koreans born before the 1950s spent their early life in poverty during the Japanese colonial period and Korean War and were thus unlikely to attain high levels of education. By 1995, only 6.6% of individuals ages 55 to 64 had attained a college-level education (OECD, 1995). In contrast to the older generation, the younger generation grew up with rapid economic growth and the expansion of higher educational opportunities (Park, 2007). The college enrollment rate increased from 11% in 1980 to 68% in 2006 (KEDI, 2010). This large generational gap in higher education may increase the possibility that children's human capital contributes to the cognitive health of aging parents in Korea.

2. Hypotheses

Hypothesis 1. Children's education will be negatively associated with parents' cognitive decline over time even after accounting for parents' education and baseline cognitive function.

Hypothesis 2. The relationship between children's education and