



Compositional and contextual associations of social capital and self-rated health in Seoul, South Korea: A multilevel analysis of longitudinal evidence

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ABSTRACT

This study aims to examine the association between social capital at the individual and administrative-area levels and individual self-rated health while adjusting for various confounders at multiple levels using a multilevel analysis with longitudinal data from Seoul, South Korea. Respondents participating in Wave 1 (2009) and 2 (2010) of the Seoul Welfare Panel Study who have full information on the independent and dependent variables were used in the final analysis. This yielded a total of 5482 participants in 2742 households, which were in turn found within 25 administrative areas in Seoul, South Korea. The results of a three level random intercept logistic regression analysis showed that an individual level perceived helpfulness and organizational participation were associated with a higher likelihood of reporting good health after controlling for individual, household, administrative-area level variables, and baseline self-rated health. However, neither administrative-area level social capital variables were associated with self-rated health. The results suggest that individual level social capital plays an important role in enhancing individual health. The results also suggest that the relatively large size of the administrative-area used in this study may be one reason which may hinder detecting any significant associations at this level. Further research is also needed to seek more relevant contexts where contextual social capital would be operating.

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Introduction

There is an increasing recognition that places where people live are important for explaining individuals' health (Fone et al., 2007; Mansyur, Amick, Harist, & Franzini, 2008; Mohnen, Groenewegen, Völker, & Flap, 2011). Apart from the physical environment, there has been growing recognition among many researchers that the social environment, in particular social capital, may play an important role in one's health (Araya et al., 2006; Eriksson, Ng, Weinehall, & Emmelin, 2011; Kim & Kawachi, 2007; Poortinga, 2006a, 2006b; Veenstra, 2005). Social capital has been linked to a wide range of health outcomes including self-rated health, psychological distress, mortality, and health behaviors (Chuang & Chuang, 2008; van Hooijdonk, Droomers, Deerenberg, Mackenbach, & Kunst, 2008; Kawachi, Kennedy, Lochner, & Prothrow-Stith, 1997; Lindström, 2010; Song, 2010; Verhaeghe, Pattyn, Bracke, Verhaeghe, & Van De Putte, 2011).

Social capital has been defined as the resources available to individuals or groups through their social relationships (Kawachi, 2010; Poortinga, 2006a; Portes, 1998; Putnam, 2000). Apart from this general definition, there is still debate over the concepts and measures of social capital (Fone et al., 2007; Greiner, Li, Kawachi, Hunt, & Ahluwalia, 2004) as there is disagreement whether social capital is a collective attribute of communities or societies, or if it is a property of individuals through social networks (Kawachi, Kim, Coutts, & Subramanian, 2004). However, scholars are increasingly agreed on the idea that social capital can be both an individual and collective asset, and therefore a multilevel analysis is more appropriate to examine the association between social capital and health than single level analysis (Elgar et al., 2011; Fone et al., 2007; Kawachi, 2006). For example, both individual and ecological level studies have their limitations (Poortinga, 2006a). An individual approach does not provide any information regarding the contextual effects of social capital, and an ecological approach does not reveal whether contextual effects of social capital are above and beyond the compositional effects of social capital (Poortinga, 2006b). On the other hand, a multilevel analysis can overcome the limitations of individual and ecological studies by considering

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multiple levels of variables simultaneously, so it can disentangle both compositional and contextual effects (Diez Roux, 2000). Hence, a multilevel analysis circumvents the ecological and atomistic fallacies that draw inferences at one level, while data was collected at another level (Diez Roux, 2002). Additionally, although social capital is a multidimensional concept, it can be better understood by distinguishing between the structural and cognitive components (Harpham, Grant, & Thomas, 2002). The structural component refers to what people do, such as organizational participation, while the cognitive dimension refers to individuals' perceptions of their social relationships, such as trust. Considering at least one variable from each component is necessary as each component is hypothesized to link to health through different pathways (Giordano, Ohlsson, & Lindström, 2011). While the cognitive component of social capital may influence health through perceived stressors and the psychosocial pathway (Berkman & Syme, 1979), the structural component of social capital may link to health via pathways associated with social support (Berkman & Syme, 1979).

To date, considerable research has been conducted to examine the association between social capital and self-rated health using a multilevel based analysis. Many studies found that social capital is associated with self-rated health at either an individual or contextual level, or both for a general population (Habibov & Afandi, 2011; Han, Kim, & Lee, 2012; Ichida et al., 2009; Kim & Kawachi, 2006; Mansyur et al., 2008; Poortinga, 2006a, 2006b; Snelgrove, Pikhart, & Stafford, 2009; Subramanian, Kim, & Kawachi, 2002). One limitation of previous studies is that most studies reported results based on cross-sectional data, preventing an evaluation of the temporal order between social capital and self-rated health. Although one study reported the results based on longitudinal data (Snelgrove et al., 2009), this study did not control for any contextual level confounder other than individual level confounders. Not adjusting for contextual level confounders may cause biased results regarding the effects of social capital on health (Mohnen et al., 2011) as the effect of social capital on health may also capture the effect of an omitted contextual level confounder. Socioeconomic deprivation of area has been a well-known factor affecting individual health (Drukker, Kaplan, Feron, & van Os, 2003; Kavanagh, Turrell, & Subramanian, 2006; Kim & Kawachi, 2007; Pickett & Pearl, 2001). And it has been also suggested that socioeconomic deprivation of area may be associated with social capital (Kawachi et al., 1997; Szreter & Woolcock, 2004). Thus, this study considers the socioeconomic deprivation of an area in a multilevel model as a potential contextual cofounder. Meanwhile, empirical research studying the associations between contextual and compositional social capital and health has been slow in Asian countries compared to the West (Ichida et al., 2009). The effect of social capital may not apply to all societies uniformly, rather its effect varies depending upon societies and cultures (Fujisawa, Hamano, & Takegawa, 2009; Habibov & Afandi, 2011). Thus, it is important to investigate the effects of social capital in Asian countries other than Western countries. Moreover, only one cross-sectional study (Han et al., 2012) based on a multilevel framework could be found in South Korea thus far, and no previous study could be found based on a multilevel framework with longitudinal data.

The main purpose of this study is to examine the association between individual and contextual levels of social capital and self-rated health while adjusting for various confounders at multiple levels using multilevel analysis with longitudinal data from Seoul, South Korea. Given that no previous study considering confounders at multiple levels with longitudinal data for the general population exists, this study further contributes to the literature on the effects of both individual and contextual levels of social capital on self-rated health.

Methods

Data source and study population

This study used data from the Seoul Welfare Panel Study (SWPS), an ongoing bi-annual longitudinal panel survey beginning in 2008 and conducted by the Seoul Welfare Foundation. The SWPS is comprised of a representative sample of households located in 25 administrative-areas in Seoul, South Korea. Seoul is the capital and largest city of South Korea. It is comprised of 25 administrative-areas and has a population of approximately 10.4 million within about 4 million households as of 2008. On average, each administrative-area is comprised of approximately 410,000 residents (ranging from around 138,000 to 676,000) within around 163,000 households (ranging from around 58,000 to 256,000) (Seoul Statistics, 2009). The sampling frame of the SWPS was households which were residing in Seoul in December 2008 based on the 2005 National Census Registry. The SWPS uses a two-stage stratified cluster sampling method. In order to select a representative sample of households in Seoul, the census tracts were stratified based on dwelling size, education, and age. At the first stage, census tracts were selected using systematic sampling with probability proportional to population size. At the second stage, households were selected within each census tract using systematic sampling. Multiple interviews were conducted in the same households and thus all members of a household whose age is 15 or older were interviewed where possible. A total of 7761 individuals within 3655 households completed the interviews in Wave 1 (2009). Of these, 6304 respondents in 2893 household completed the interviews in a follow-up survey in Wave 2 (2010), demonstrating response rates for household 87.6% and household membership 87.5%, respectively. Full details of surveys and data can be found here. (<http://panel.welfare.seoul.kr/>). No ethical approval was needed for this study because data for the current study is publicly available.

This study excluded participants who had moved districts or households between Wave 1 and Wave 2, who had moved out of Seoul after Wave 1, and who had newly participated in Wave 2. Of these, participants who had full information on the independent variables and dependent variables were used in the final analysis. A total of 5482 participants in 2742 households within 25 administrative-areas were identified. The number of respondents per administrative-area ranged from 134 to 323 with an average of around 219.3 and household ranged from 1 to 7 with an average of around 2.0.

Outcome variable

The outcome measure was self-rated health on Wave 2. Respondents were asked to rate their health status using a five-point Likert scale ranging from 1 (very healthy) to 5 (very unhealthy). A dichotomous variable was created with a value of 1 indicating very healthy or healthy (good health) and a value of 0 indicating fair/unhealthy/very unhealthy (poor health). This dichotomization has been frequently used in previous studies (Han et al., 2012; Lindström, 2009; Poortinga, 2012; Snelgrove et al., 2009). Self-rated health has been shown to be a strong and robust predictor of mortality and was also found to be fairly insensitive to the differences in the wording of the question (Idler & Benyamini, 1997).

Social capital variables

Two individual level social capital variables were used from Wave 1. Perceived helpfulness was measured by asking respondents: "There is no one from whom I can get help or lean on in

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