



A multilevel cross-lagged structural equation analysis for reciprocal relationship between social capital and health



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ABSTRACT

We investigated the reciprocal relationship between individual social capital and perceived mental and physical health in the UK. Using data from the British Household Panel Survey from 1991 to 2008, we fitted cross-lagged structural equation models that include three indicators of social capital vis. social participation, social network, and loneliness. Given that multiple measurement points (level 1) are nested within individuals (level 2), we also applied a multilevel model to allow for residual variation in the outcomes at the occasion and individual levels. Controlling for gender, age, employment status, educational attainment, marital status, household wealth, and region, our analyses suggest that social participation predicts subsequent change in perceived mental health, and vice versa. However, whilst loneliness is found to be significantly related to perceived mental and physical health, reciprocal causality is not found for perceived mental health. Furthermore, we find evidence for reverse effects with both perceived mental and physical health appearing to be the dominant causal factor with respect to the prospective level of social network. Our findings thus shed further light on the importance of social participation and social inclusion in health promotion and aid the development of more effective public health policies in the UK.

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1. Introduction

A growing recognition of the social determinants of health suggests that social capital contributes to health inequalities both within and between populations (Henderson and Whiteford, 2003). Generally, the research suggests that higher levels of social capital can enhance an individual's sense of self-efficacy and mastery, reduce alienation and stress and ultimately contribute to a sense of well-being, thereby improving health (Morrow, 1999). There is also a consensus that social capital is important in encouraging a physically active lifestyle (Booth et al., 2000; Giles-Corti and Donovan, 2002; Greiner et al., 2004; Leyden, 2003). Social capital might therefore provide a theoretical basis for assessing the impact of community-based health promotion programs on the broader health and life of a community (Baum, 2003). In particular, there is a pressing need in the UK to inform the debate concerning

the veracity of claims that building social capital is an important facet of national health policy. Policy makers have generally accepted the importance of social capital and made changes to health policy accordingly. For instance, the Allen Review, an independent report presented to the UK Government, emphasises the importance of family and community relationships in stimulating the physical, emotional and social development of children and adolescents at key life stages (Allen, 2011). And the UK Department of Health (DoH) has explicitly cited developing social capital as an important feature of health promotion (DoH, 2001, 2006, 2010).

Previous studies highlight a considerable debate over whether social capital is a feature of individuals (Burt, 2009), groups (Bourdieu and Wacquant, 1992) or both (Coleman, 1988; Putnam, 2001). Kawachi (2006) argues that there are two distinct concepts of social capital: social cohesion and social network. The former tends to emphasize social capital as a group attribute and analyses it as a contextual effect on individual health. The later describes social capital in terms of the resources that are embedded within an individual's social networks (Lin, 1999). An additional distinction in research on social capital is between structural and

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cognitive dimensions (Putnam et al., 1994). The structural dimension reflects the ‘quantity’ of social capital and is characterised by behavioural manifestations of associational links between individuals or civic engagement. The cognitive dimension is regarded as the ‘quality’ of social capital as it reflects subjective attitudes such as trust in others and norms of reciprocity (Harpham et al., 2002; Phongsavan et al., 2006). A number of studies have suggested that personal ties, contacts and mutual support enhance an individual’s access to information, resources, opportunities and public welfare policy, making available assistance and emotional support and thus meeting physical and mental health needs (Muntaner, 2004; Nakhaie and Arnold, 2010; Pearce and Davey Smith, 2003).

Folland (2008) indicates that there are three prominent theoretical ideas as to how social capital may improve health: First, both physical and mental health may benefit from sympathetic relationships, a trusting environment, or through the benefits of socializing. Second, social capital provides information on the effectiveness of health care or health behaviours. And third, increased positive social capital enhances an individual’s sense of responsibility, both to one’s self and to one’s key relationships, and would be expected to enhance the benefit of becoming and staying healthy.

Whilst international studies based on longitudinal data have generally supported a causal relationship from social capital to health (Drukker et al., 2003; I. Kawachi et al., 1996; Orthogomer et al., 1993; Welin et al., 1992), a systematic review by Murayama et al. (2012) finds that prospective evidence of the effect of social capital on health in the UK is somewhat limited – only two out of nine articles. This obfuscates the relationship between health outcomes and social capital and seriously impedes any attempt to identify causality. For example, De Silva et al.’s (2005) systematic review of the relationship between social capital and mental health concludes that there is strong evidence that mental illness could result in low social capital as mentally ill individuals are more likely to appraise things negatively and to withdraw socially.

Our aim in what follows is to investigate the temporal and directional character of the relationship between individual-level social capital and perceived mental and physical health using longitudinal data. Such data provide a distinct advantage over cross-sectional data in the variety of sources of variability for understanding causality (Hedström and Ylikoski, 2010). However, the longitudinal analyses in previous studies have been limited to regression or latent growth models in which social capital is served as the criterion measure. Using data from the British Household Panel Survey (BHPS) from 1991 to 2008, we constructed a cross-lagged structural equation model to consider three indicators of social capital and health outcomes together, making it possible to unravel the reciprocal temporal relationships. Since multiple measurement points (level 1) are nested within individuals (level 2), the multilevel model is specified to account for two inherent types of heterogeneity – within-person across time and between-person – thereby identifying the within-person variability over time from the between-person variability found in cross-sectional analyses (Hoffman and Stawski, 2009).

The paper is set out as follows: Section 2 describes our methods in detail whilst Section 3 discusses our estimation and modelling. Our results are presented in Section 4 and final comments are collected in Section 5.

2. Methods

2.1. Data collection

Our data are derived from the British Household Panel Survey

(BHPS) from September 1991 through September 2008. The BHPS is a nationally representative panel survey of the British population on a micro-social level following a sample of approximately 5500 households and over 10,000 individual respondents aged 16 and over annually since 1991. All original sample members are retained in the panel for as long as possible, even when moving to new households. Those who join the household of a sample member are also included in the survey for as long as they remain in the same household as a sample member. As such, the BHPS includes detailed individual level data in a longitudinal context that satisfy the basic requirement of our substantive analyses.

To ensure comparability over our sample period, we constructed a balanced panel in which information on all the required variables is reported at each wave and in which observations are limited to respondents who answer questions in each wave. The social capital indicators used in our study are not measured at every wave: social participation is recorded in waves 1–5, 7, 9, 11, 13, 15, and 17; social network is recorded in waves 2, 4, 6, 8, 10, 12, 14, 16, and 18; and loneliness is recorded in 1, 3, 5, 7, 9, 11, 13, 15, and 17. We therefore calculated an average of the variables from two adjacent waves every two waves over 18 waves to create values at nine measure points. For example, the value at the first measure point is the average of the first and second waves in the original data. The value at the second measure point is the average of the third and fourth waves, and so on. Information on employment, marital status, and educational attainment was estimated using the values at odd-numbered waves. Because the gap is only one year and most demographic variables are highly persistent, we contend that any bias is likely to be very small. Since estimation of an unbalanced panel is affected by attrition bias over time (Wooldridge, 2005), we focused our analysis on a balanced sample of 3039 individuals, implying 27,351 observations over the nine measure points.

2.2. Measures of perceived mental health

We used the responses to the General Health Questionnaire (GHQ) to measure perceived mental health or psychological well-being. The BHPS uses a 12-item version of the GHQ (GHQ-12) based on answers to questions on concentration, sleep loss due to worry, perception of role, capability in decision making, whether constantly under strain, perception of problems in overcoming difficulties, enjoyment of day-to-day activities, ability to face problems, loss of confidence, self-worth, general happiness and whether suffering depression. The questionnaire is usually self-administered and is based on the respondent’s assessment of their present psychological well-being (Bowling, 2005; Williams and Goldberg, 1988). The respondents are asked to indicate on a four-point ordinal scale how they have felt recently with respect to the item in question. We adopted the standard GHQ dichotomous coding method (i.e. ‘0 0 1 1 coding’) for each of the four possible responses to each item, as advocated by the questionnaire’s author (Williams and Goldberg, 1988). Using this method, the maximum score for any respondent is therefore twelve. The scoring was then reversed such that higher scores reflect an improvement in mental health or a reduction in mental illness. There is no universally used threshold value for GHQ-12 to identify probable self-rated mental health because the populations it is used on vary considerably. We chose a threshold value of eight, as suggested by the author of the questionnaire, to identify ‘cases’ of mental health and to create a dichotomous indicator of positive or negative self-rated mental health (Williams and Goldberg, 1988). The predictive and content validity of the GHQ-12 is good in comparison to other well-known scaling tests of mental health (see, for example, Bowling, 2005). The GHQ-12 also performs well in reliability tests and has been shown to be robust to re-testing, making it a suitable longitudinal

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