Community Resilience and Wellbeing in Wales: A Secondary Analysis of the 2007 and 2009 Citizenship Survey

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Summary

It is well-known that living in a deprived neighbourhood can adversely affect health over and above individual socio-economic status (Pickett & Pearl, 2001). However, not all communities are equally affected by neighbourhood deprivation. Some show remarkable resilience in the face of sometimes great economic adversity. This study examined how social aspects of the neighbourhood environment may contribute to community wellbeing and resilience in Wales. This was done by using the *bonding*, *bridging*, and *linking social capital*[1] framework of Szreter and Woolcock (2004) and data from the 2007 and 2009 *Citizenship Survey* (n=1,099).

In line with previous research, this study found that people living in the most deprived neighbourhoods were the least likely to report good health; and that they have the lowest levels of bonding social capital (as indicated by *neighbourhood cohesion*, *neighbourhood trust*, and *civic participation*), bridging social capital (as indicated by *intergroup social cohesion*, *general social trust*, and *heterogeneous relationships*), and linking social capital (as indicated by *political efficacy* and *political trust*).

A range of bonding, bridging and linking social capital indicators were found to be important for community health. People reporting higher levels of *neighbourhood cohesion* and *civic participation* were less likely to report poor health, as were those with more *heterogeneous relationships*, and those with more *political efficacy* and *political trust*.

Mixed results were found as to whether social capital contributes to community resilience. Although a number of interaction effects were found between neighbourhood deprivation on the one hand and *neighbourhood cohesion*, *heterogeneous relationships*, and *political trust* on the other, the results were not completely in line with the expectations that higher levels of social capital provide a buffer for those living in the most deprived neighbourhoods. While neighbourhood cohesion appears to mainly benefit people living in the least deprived neighbourhoods, having ethnically diverse friendships is the most beneficial for people living in the most deprived neighbourhoods. Political trust benefits those living in 'intermediate' neighbourhoods the most. Other aspects of social capital were not found to contribute to neighbourhood resilience.

[1] An interpretation of these terms are given on page 15

Overall, the findings of this study show the diverse nature of social capital and its workings in contributing to community health and resilience. Neighbourhood deprivation has widespread implications for community health and appears to affect the social fabric of these areas. Not only do respondents living in the most deprived areas report the worst health, they also report significantly lower levels of bonding, bridging and linking social capital. Furthermore, the study has shown that bonding, bridging and linking social capital all contribute to community health and resilience.

Introduction

Background

It is well-known that living in a deprived neighbourhood can adversely affect health. One of the most consistent findings in health research is that people living in deprived areas experience poorer health than people living in non-deprived areas (Yen & Syme, 1999; Pickett & Pearl, 2001). Neighbourhood deprivation is arguably the most important risk factor for public health and wellbeing. Growing up and/or living in deprived conditions may limit education and employment opportunities; increase experienced stress; and affect individuals' self-esteem, social status, and social support. All of these have been linked to a range of negative health outcomes (Cohen & Wills 1985; Turner 1995; Conner & Norman 2005; Poortinga et al 2008b). The Marmot Review concluded that people living in the poorest neighbourhoods will –on average- die seven years earlier than people living in the richest neighbourhoods (Marmot et al 2010). It is now widely recognised that health in developed countries is associated with peoples' relative living standards (as compared to the wider society) rather than absolute living standards (Wilkinson 1996). It can not be assumed that associations between neighbourhood socio-economic status and health mean that living in a deprived neighbourhood is bad for one's health. Individual socio-economic status may partly drive the association at the neighbourhood level, as more people with lower socio-economic status live in deprived neighbourhoods. However, there is robust evidence that neighbourhood deprivation affects individual health *over and above* individual socio-economic status (e.g. Picket & Pearl 2001).

Not all communities are equally affected by neighbourhood deprivation. Although individuals in deprived neighbourhoods generally have poorer health than those living in more affluent areas, some individuals and/or communities show remarkable resilience in the face of -sometimes great- economic adversity. That is, some neighbourhoods have better health than can be expected on the basis of neighbourhood deprivation alone (see e.g. Fone et al 2007). Resilience has received a lot of attention in psychological literature in the past two decades, particularly in relation to child and adolescent development (Masten et al 1990; Garmezy 1991; Luthar 2000; Rutter 2006; Aisenberg & Herrenkohl 2008). However, it is only until relatively recently that resilience has been used to explain the wide variety of community responses to the stresses of economic adversity (Doran et al 2006; Sanders et al 2008; Mitchell et al 2009). It is therefore of interest to identify the factors that make communities resilient to the detrimental impacts of deprivation in order to be able to reduce the existing inequalities in health.

Theoretical and empirical work in the area of resilience has identified a range of factors that may help communities to deal with neighbourhood deprivation (Davis et al 2005; Friedli 2009; Mitchell et al 2009; Sanders et al 2008). The lack of uniform results across different health domains suggests that a variety of processes may be in operation (Mitchell et al 2009). Capacity for resilience can be derived from a range of adaptive processes utilising various assets and resources (Fergus & Zimmerman 2006). As suggested by the *five capitals model* (e.g., Porritt, 2007), communities need access to an array of resources to flourish. In the absence of sufficient economic capital, deprived neighbourhoods are reliant upon other resources to maintain good health; with healthy neighbourhoods having a balanced combination of *human capital* (skills and education), *social capital* (social networks), *built capital* (physical infrastructure), *natural capital* (access to green space), and *economic capital* (income) resources.

In this research we combine the Welsh responses of the *2007 and 2009 Citizenships Survey* in order to identify the social aspects of the neighbourhood environment that may help to buffer against the negative impacts of deprivation in Welsh communities. The Citizenship Survey data is analysed from a *social capital perspective*, and builds upon existing theoretical frameworks (Szreter & Woolcock 2004) and previous empirical research (Poortinga 2006a;b;c;d; Poortinga et al 2007; 2008a;b).

Theoretical Framework: Social Capital, Resilience, and Wellbeing

Over the past decade, research has provided clear evidence that social capital, as reflected in social trust and civic participation, is associated with many different positive health outcomes (Kawachi et al 2004). For example, social capital has been linked to higher levels of subjective health and wellbeing (Helliwell 2003; Subramanian et al 2002; Poortinga 2006a;b), lower cardiovascular and cancer mortality (Kawachi et al 1997), lower suicide rates (Helliwell 2003), and lower levels of violent crime (Kennedy et al 1998). Furthermore, it has been suggested that social capital may help to reduce the adverse effects of neighbourhood deprivation. Research has shown that individuals living in deprived areas with high levels of social cohesion generally have better health than those living in similarly deprived areas with low levels of social cohesion (Cattell 2001; McKenzie et al 2002; Fone et al 2007). Although this shows that social capital and cohesion may contribute to community resilience and wellbeing, 'social capital' is sometimes considered to be an ineffective analytic tool, as it is too broad and multi-faceted to be useful for examining community health (Portes 1998; Kawachi et al 2004). It has been suggested that 'social capital' could cover nearly every aspect of the social environment (Poortinga 2006b). The broad nature of social capital

has led to a certain impasse in empirical research on the topic. Most work in the area has taken a very generic approach to the measurement of social capital. In most cases the multiple facets of social capital are not considered and associated social phenomena not taken into account.

This research will use the theoretical framework of Szreter and Woolcock (2004), where *bonding social capital* refers to 'inward looking' social networks that reinforce exclusive identities and homogeneous groups; *bridging social capital* to 'outward looking' social networks across different social and ethnic groups that may not share similar identities; and *linking social capital* to norms of respect and trusting relationships across power or authority gradients. This framework will be used to examine how social aspects of the neighbourhood environment may contribute to community resilience. As mentioned above, research has primarily focused on *bonding social capital*, using Robert Putnam's (2000) definition of social capital. Although this research has shown that indicators of interpersonal trust, norms of reciprocity, and involvement in voluntary organisations are linked to higher levels of community health (Carpiano 2006), the focus was limited to *bonding* aspects of *social capital* and obscured the role of other elements of the social environment that may be relevant to healthy and resilient communities.

For example, limited effort has gone into examining the role of *bridging social capital*, whilst there are strong theoretical arguments for it being important for individual and community wellbeing. Both Granovetter (1973) and McPherson et al (2001) argue that *diverse relationships* are vitally important for a person's well being. Although Granovetter (1973) acknowledges the importance of 'strong social ties', he argues that 'weak ties' are responsible for a person's integration into society and suggests that this may help them to 'get ahead' in life. Additionally, Granovetter (1973) suggests that novel information flows more smoothly through weak rather than strong ties and social networks may constrain both behaviour and the flow of information because of strong social norms that are active within that network. McPherson et al (2001) make a similar argument in that *homophily*, the tendency for people to bond and associate themselves with people similar to themselves (e.g., in terms of ethnicity or socio-economic status), occurs at a high rate; the consequences of this being that it restricts a wider outlook of the world and confines people to 'provincial' news and views of close friends. There is some empirical evidence that an over-reliance on tight neighbourhood networks may lead to less desirable outcomes where unhealthy norms are dominant (Friedrichs & Blasius 2003). Ahern and colleagues (2009) have shown that social norms and social cohesion in combination influence health behaviours such as smoking. They found that in neighbourhoods where norms with regard to

smoking are the most permissive, higher social cohesion increase the likelihood of people smoking; while in neighbourhoods where norms are strongly anti-smoking, higher social cohesion reduce the likelihood of people smoking. Having heterogeneous relationships may therefore be beneficial for community resilience, as individuals involved in multiple internal and external neighbourhood networks will be less uniformly exposed to the harmful influence of neighbourhood deprivation than those solely relying on 'inward looking' homogeneous neighbourhood networks.

Although the distinction between bonding and bridging social capital has been around for some time (Portes 1998; Putnam 2000), the social capital framework initially excluded explicit 'vertical' social relations (Kawachi et al 2004). Szreter and Woolcock (2004) therefore introduced the idea of *linking social capital*, which refers to how neighbourhoods are vertically networked with institutions and political structures (Warren et al 2001). Very few studies have been conducted to examine how linking aspects of social capital are associated with community wellbeing. Although some studies have shown that political participation is important for community health (Blakely et al 2001; Jun et al 2004; Sundquist et al 2006), more work needs to be done with other indicators of linking social capital.

Linking social capital is closely associated with *political efficacy and trust*, which have been shown to be linked to community participation and mobilisation (Levi & Stoker 2000) and are seen as important conditions for effective risk communication (Fischhoff et al 2002; Covello 2003; Poortinga & Pidgeon 2003; 2004; Glik 2007). *Political efficacy* (whether communities feel they are able to influence political affairs) may be important for community health, as inward-oriented social cohesion alone may not be sufficient to be able to effectively fight potential cuts and/or lobby for improvements in local services (Fuchs et al 2001). The other aspect of political capital –*political and institutional trust*- is likely to be important for how communities respond to health advice and health promotion initiatives (Glik 2007).

Szreter and Woolcock (2004) powerfully argue that all three forms of social capital are important for people's health and wellbeing: *bonding social capital* for the necessary social support, *bridging social capital* for solidarity and respect across the social spectrum, and *linking social capital* for the effective mobilisation of political institutions and will. However, as yet it has not been empirically examined how the different aspects of social capital work in conjunction with regard to community resilience and wellbeing.

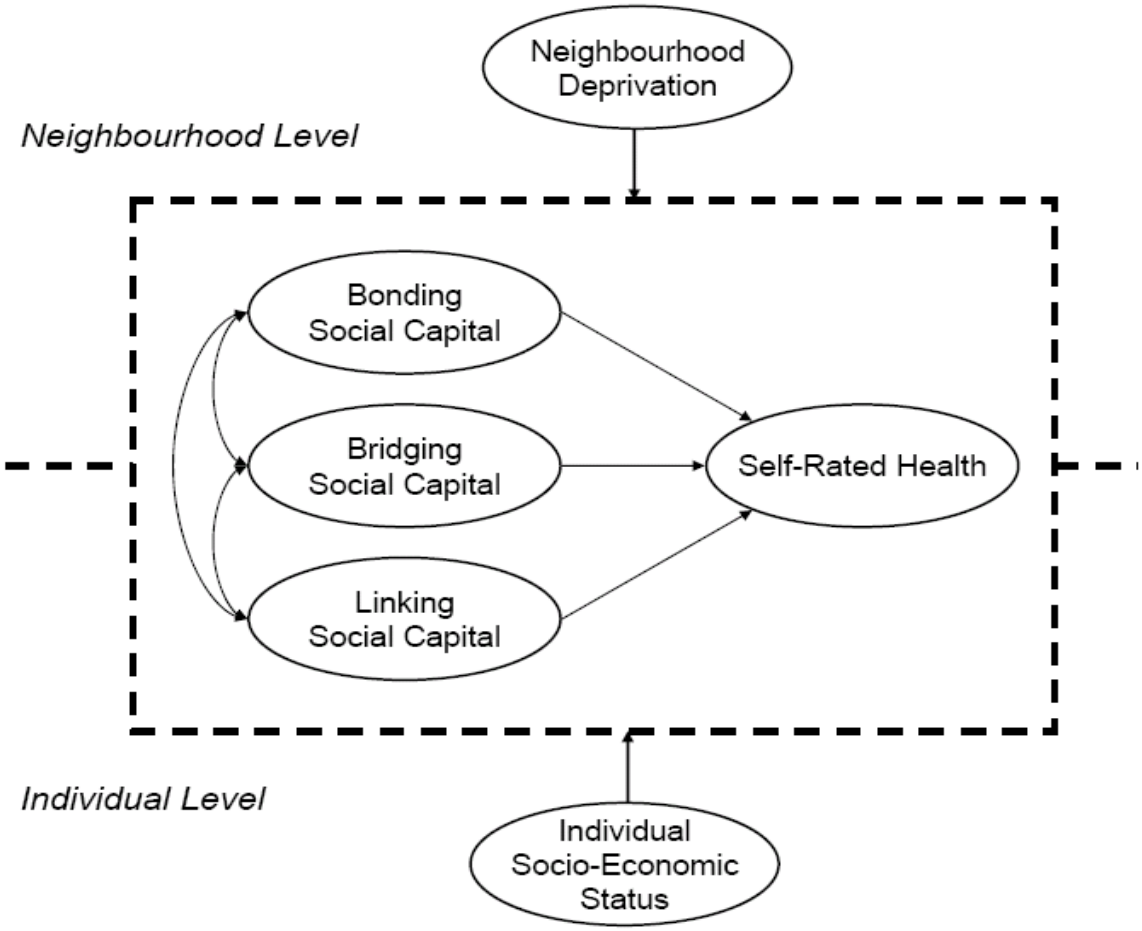

Figure 1: Conceptual framework

Research Questions

The principal goal of the proposed research is to empirically examine how social aspects of the neighbourhood environment contribute to community wellbeing and resilience in Wales. This will be achieved by addressing three interlinked research questions, based on the framework depicted in Figure 1:

(1) *To what extent is neighbourhood deprivation, as reflected by the WIMD, associated with individual self-rated health in Wales?*
(2) *To what extent are the different aspects of bonding, bridging, and linking social capital associated with individual self-rated health in Wales?*
(3) *Do the different aspects of bonding, bridging, and linking social capital buffer against the detrimental health impacts of neighbourhood deprivation?*

It is expected that all three forms of social capital –*bonding*, *bridging*, and *linking*– are important for community well-being and resilience. Individuals with higher levels of bonding, bridging and linking social capital are expected to report better health in comparison to those with lower levels of these different aspects of social capital. Furthermore, it is expected that all three types of social capital will buffer against the detrimental health impacts of neighbourhood deprivation. That is, it is expected that individuals living in deprived areas with high levels of social cohesion generally have better health than those living in similarly deprived areas with lower levels of social cohesion. In other words, neighbourhood deprivation is expected to be associated with worse self-reported health with these effects being less pronounced for individuals with higher levels than for those with lower levels of bonding, bridging and linking social capital.

Method

The 2007 and 2009 Citizenship Survey

In this research we combine the Welsh responses of the *2007 and 2009 Citizenship Survey*, creating an overall Welsh dataset of 1,099 respondents (532 + 567 respondents, respectively). The Citizenship Survey includes a wide range of questions that can be used as indicators of *bonding, bridging and linking social capital* (see Table 1). Furthermore, the Citizenship Survey includes the widely-used *self-rated health* measure, which has been shown to be a valid indicator of general wellbeing and a predictor of mortality (Idler & Benyamini, 1997), as well as the Welsh *Index of Multiple Deprivation* (WIMD). More information about the Citizenship Survey and the measures is provided in Appendix A.

Table 1: Aspects of Bonding, Bridging, and Linking Social Capital

SOCIAL CAPITAL TYPE	ASPECT	INDICATOR
BONDING	*Neighbourhood Cohesion*	To what extent do you agree or disagree that people in this neighbourhood pull together to improve the neighbourhood?
	Neighbourhood Trust	How many people in your neighbourhood can be trusted?
	Neighbourhood Belonging	How strongly do you belong to your neighbourhood?
	Civic Participation	Number of groups, clubs or organisations people have taken part in over the last 12 months
BRIDGING	*Inter-group Social Cohesion*	To what extent do you agree or disagree that this local area (…) is a place where people from different backgrounds get on well together?
	Social Trust	Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?
	Heterogeneous Relationships	What proportion of your friends have similar incomes to you?
		What proportion of your friends are of the same ethnic group as you?
LINKING	*Political Participation*	Have you contacted any of the people mentioned above?[1]
		In the last 12 months have you attended a public meeting or rally, (…) public demonstration or protest, or signed a petition?
	Political Efficacy	Can you influence decision affecting your local area?
	Political Trust	How much do you trust the local council?
		How much do you trust the police

Data Analyses

Chi-square tests and *Analysis of Variance* (*ANOVA*) are used to analyse the data. The *Results* section of this report divided into four parts. First, the responses to the various health and social capital questions from the 2007 and 2009 Citizenship Surveys are reported. *Chi-square* (X^2) tests are used to show if there are any significant differences between the two samples. This descriptive part of the results shows the distribution of the different indicators of bonding, bridging and linking social capital, and highlights whether the two datasets can be combined to conduct overall statistical analyses.

The second section describes the results according to the level of neighbourhood deprivation, as indicated by the WIMD. Based on this WIMD index, neighbourhoods were divided into quintiles, with 1 representing the 20% *least* deprived and 5 representing the 20% *most* deprived neighbourhoods. Associations between neighbourhood deprivation on the one hand and self-reported health and the social capital indicators on the other were assessed using *Chi-square* tests. This second section will address *Research Question 1* ("*to what extent is neighbourhood deprivation (…) associated with individual self-rated health in Wales*"), but will also investigate to what extent neighbourhood deprivation is associated with the different indicators of bonding, bridging and linking social capital.

In the third section associations between the different forms of social capital and self-rated health are examined using *Chi-square* tests (*Research Question 2*). This part of the results section will investigate whether individuals with higher levels of bonding, bridging, and linking social capital report better health than those with lower levels of bonding, bridging, and linking social capital.

The fourth and final part of the results section will examine whether the different aspects of bonding, bridging, and linking social capital help to buffer against the detrimental health impacts of neighbourhood deprivation (*Research Question 3*). Two-factor *Analyses of Variance* (ANOVA) are conducted to explore interactions between the different indicators of social capital and neighbourhood deprivation. Interactions show if the associations between neighbourhood deprivation and individual health are modified by the level of social capital. This analysis will show whether and to what extent the different forms of social capital contribute to neighbourhood resilience.

Results

The 2007 and 2009 Citizenship Surveys

This part of the results section reports the distribution of the responses to the different health and social capital questions in the 2007 and 2009 Citizenships Surveys.

Table 1 shows that most respondents in 2007 considered their health to be good or very good (71%), whereas 9% of respondents considered their health to be bad or very bad. Sixty-seven per cent of respondents in 2009 considered their health to be good or very good, while 7% of respondents considered their health to be bad or very bad. There was no significant difference between the 2007 and 2009 samples in terms of self-rated health.[2]

Table 1: Health (%)

		2007 (%)	2009 (%)	Total (%)
How is your health in general?	Very good	34	34	34
	Good	37	33	35
	Fair	21	26	23
	Bad	8	6	7
	Very bad	1	1	1

Table 2 shows that 70% of the respondents in 2007 and 71% in 2009 agreed or tended to agree that people in their neighbourhood would pull together to improve their neighbourhood. There were no significant differences in *neighbourhood cohesion* between the two samples.[3] There were also no significant differences between the 2007 and the 2009 samples in terms of *neighbourhood trust*.[4] Twelve per cent of the 2007 respondents and 13% of the 2009 respondents reported that 'a few' or no people in their neighbourhood can be trusted. Table 2 shows that in 2009 slightly more respondents thought that 'many' people could be trusted than in 2007 (60% versus 58%).

[2] $X^2(4) = 4.345$, $p = 0.361$

[3] $X^2(3)=1.679$, $p=0.642$

[4] $X^2(3)=1.694$, $p=0.638$

No significant difference was found in the level of *neighbourhood belonging* between the two samples.[5] The majority of respondents in 2007 and 2009 (88% and 87%, respectively) reported that they feel that they belong to their neighbourhood (see Table 2). There was no significant difference between 2007 and 2009 in terms of *civic participation*.[6] Forty-six per cent of the respondents in 2007 and 39% of the respondents in 2009 reported that they had not taken part in any group, club or organisation over the last 12 months (see Table 2).

Table 2: Bonding Social Capital (%)

		2007 (%)	2009 (%)	Total (%)
Neighbourhood Cohesion				
To what extent do you agree or disagree that people in this neighbourhood pull together to improve the neighbourhood?	Definitely agree	24	22	23
	Tend to agree	46	49	48
	Tend to disagree	21	20	20
	Definitely disagree	10	9	9
Neighbourhood Trust				
How many people in your neighbourhood can be trusted?	Many	58	60	59
	Some	30	27	28
	A few	11	11	11
	None	1	2	2
Neighbourhood Belonging				
How strongly do you belong to your neighbourhood?	Very strongly	47	47	47
	Fairly strongly	36	38	37
	Not very strongly	14	13	14
	Not at all strongly	3	2	3
Civic Participation				
Number of groups, clubs or organisations people have taken part in, supported or helped, over the last 12 months	None	46	39	42
	One	19	23	21
	Two	14	13	13
	Three or more	23	26	24

[5] $X^2(3)=2.647$, p=0.449

[6] $X^2(4)=5.531$, p=0.137

Table 3 shows that 74% of the respondents in 2007 and 76% of the respondents in 2009 definitely agreed or tended to agree that their local area is a place where people from different backgrounds got on well together. This difference was not statistically significant.[7]

There was also no significant difference in the *social trust* aspect of bridging social capital between the two samples.[8] The majority of the 2007 and the 2009 samples thought that you can't be too careful in dealing with people (56% and 54% respectively; see Table 3).

Table 3: Bridging Social Capital (%)

		2007 (%)	2009 (%)	Total (%)
Inter-group Social Cohesion				
To what extent do you agree or disagree that this local area (…) is a place where people from different backgrounds get on well together?	Definitely agree	16	22	19
	Tend to agree	58	54	56
	Tend to disagree	11	10	10
	Definitely agree	2	3	2
	Don't know	15	12	13
Social Trust				
Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?	People can be trusted	44	46	45
	You can't be too careful	56	54	55
Heterogeneous Relationships				
What proportion of your friends have similar incomes to you?	All similar	41	40	40
	More than a half	25	24	24
	About/ Less than a half	35	36	36
What proportion of your friends are of the same ethnic group as you?	All similar	71	67	68
	More than a half	23	25	24
	About/ Less than a half	7	8	8

[7] $X^2(4)=8.621$, p=0.071

[8] $X^2(1)=0.525$, p=0.469

When asked what proportion of their friends had incomes similar to themselves and what proportion of their friends were from the same ethnic group, no significant differences were found between 2007 and 2009.[9] Sixty-six per cent of the respondents in 2007 and 64% of the respondents in 2009 had 'all' or 'more than half' of their friends with similar incomes to themselves; and the majority of the respondents had 'all' or 'more than half' of their friends from the same ethnic group as themselves (94% and 92%, respectively; see Table 3). This pattern reflects the relatively low numbers of ethnic minorities living in Wales.

Table 4 shows the responses to the five indicators of linking social capital (i.e. political participation, political efficacy and political trust aspects). With regard to *political participation*, the 2009 respondents had contacted public officials more often than the 2007 respondents (29% versus 20%).[10] However, when asked how often they had attended a public meeting, rally, public demonstration, protest or signed a petition, the majority of the respondents had not taken part in these activities (74% for 2007 and 72% for 2009). The latter difference was not statistically significant.[11]

Table 4 further shows a slight increase in *political efficacy* between 2007 and 2009. The 2009 respondents felt more able to influence decisions affecting their local area than the 2007 respondents (39% versus 29%).[12]

In terms of *political trust*, no significant differences were found between the 2007 and 2009 samples (see Table 4). Fifty-four per cent of the respondents in 2007 and 57% of the respondents in 2009 had either a lot or a fair amount of trust in the local council, and 77% of the respondents in 2007 and 78% of the respondents in 2009 had either a lot or a fair amount of trust in the police.[13]

[9] $X^2(2)=0.373$, $p=0.830$; and $X^2(2)=1.935$, $p=0.380$, respectively

[10] $X^2(1)=11.647$, $p<0.001$

[11] $X^2(1)=0.420$, $p=0.517$

[12] $X^2(3)=10.767$, $p<0.05$

[13] $X^2(3)=3.294$, $p=0.349$ and $X^2(3)=6.641$, $p=0.084$, respectively.

Table 4: Linking Social Capital (%)

		2007 (%)	2009 (%)	Total (%)
Political Participation				
Have you contacted any of the people mentioned above?[1]	Yes	20	29	24
	No	80	71	76
In the last 12 months have you attended a public meeting or rally, taken part in a public demonstration or protest or, signed a petition?	Yes	26	28	27
	No	74	72	73
Political Efficacy				
Can you influence decisions affecting your local area?	Definitely agree	4	7	6
	Tend to agree	25	32	29
	Tend to disagree	43	36	40
	Definitely disagree	28	25	26
Political Trust				
How much do you trust the local council?	A lot	5	8	7
	A fair amount	49	49	49
	Not very much	34	32	33
	Not at all	11	11	11
How much do you trust the police	A lot	25	31	28
	A fair amount	52	47	49
	Not very much	18	15	17
	Not at all	5	6	6

Note: (1) Local councillor, Member of Parliament (MP), public official working for local council, Government official, elected member of the Greater London Assembly/ Mayor of London, public official working for the Greater London Assembly/ Authority, elected member of the National Assembly for Wales/ First Minister, public official working for the National Assembly for Wales.

Summary

This part of the results section has shown that people in Wales tend to have high levels of bonding social capital. A clear majority of the respondents reported high levels of neighbourhood cohesion, neighbourhood trust, and neighbourhood belonging. Moreover, civic participation was high, with more than half having taken part in at least one group, club or organisation in the last 12 months.

The results in regard to the different indicators of bridging social capital are more mixed. Whereas a majority agreed that there is a high level of mutual respect in their local area, a minority expressed a high level of general social trust. Overall, more people reported ethnically homogeneous relationships than socio-economically homogeneous relationships. This pattern reflects the relatively low numbers of ethic minorities living in Wales.

Levels of linking social capital were generally lower. In regards to political participation, only about one in four had contacted a public official, attended a public meeting or demonstration or signed a petition. Also political efficacy was low, with only about one in three agreeing that they can influence decisions affecting their local authority. Political trust was slightly higher, with a clear majority trusting the local council and the police

Overall, very few differences were found between the two datasets. The 2007 and 2009 Citizenship Surveys were very similar in terms of bonding social capital and bridging social capital. Although small differences were found in political participation and political efficacy, no major differences were found for other aspects of linking social capital.

Neighbourhood Deprivation, Social Capital and Health

The second part of the results section describes the results according to neighbourhood deprivation, as indicated by the WIMD. This section addresses *Research Question 1* ("*to what extent is neighbourhood deprivation (…) associated with individual self-rated health in Wales?*"), but also investigates to what extent neighbourhood deprivation is associated with the different indicators of bonding, bridging and linking social capital.

Figure 2 presents the association between neighbourhood deprivation and self-rated health. The graph highlights the differences in responses to the self-rated health questions between the five quintiles of neighbourhood deprivation.[14] The figure shows a clear (linear) association between neighbourhood deprivation and self-reported health, with participants living in the most deprived neighbourhoods reporting the poorest health.[15]

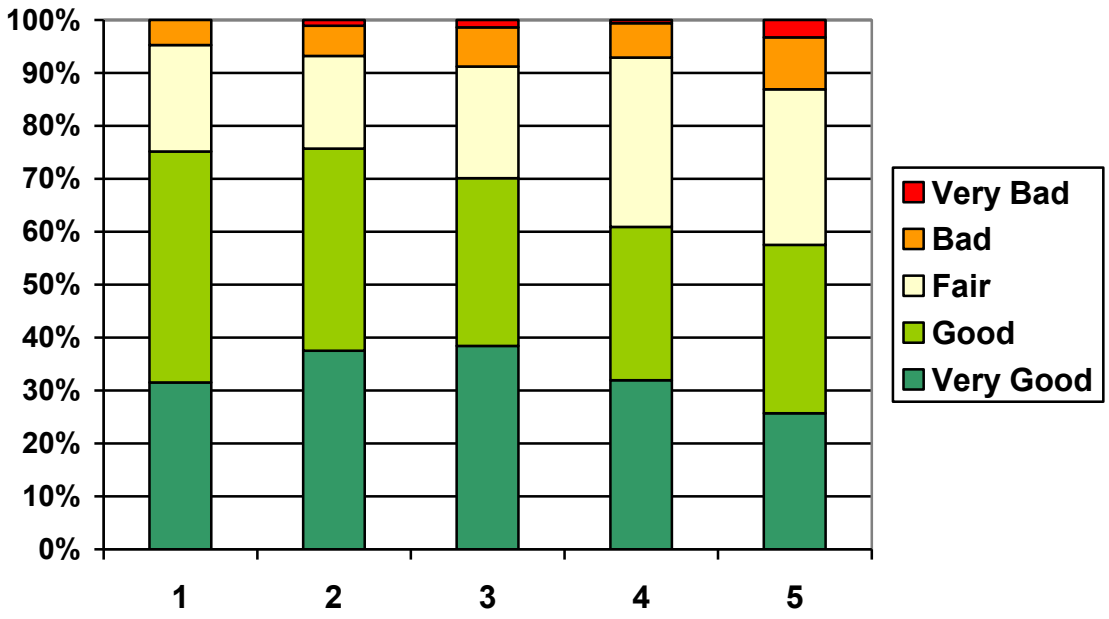

Figure 2: Neighbourhood Deprivation and Health

[14] Neighbourhoods were divided into quintiles, with 1 representing the 20% least deprived and 5 representing the 20% most deprived neighbourhoods.

[15] $X^2(16)=41.851$, $p<0.001$; Linear-by-Linear association $X^2(1)=18.940$, $p<0.001$

The self-rated health question was subsequently dichotomised to simplify further statistical analyses. A distinction was made between respondents reporting good and very good health and those reporting fair, bad and very bad health. Table 5 shows that there were significant differences in how the respondents reported their health in the five deprivation quintiles.[16] Seventy-five per cent of the respondents in the least deprived area and 58% of respondents in the most deprived area considered their health to be good or very good.

Table 5: Neighbourhood Deprivation and Health (%)

	Least Deprived				Most Deprived
	1	2	3	4	5
Good/Very Good	75	76	70	61	58
Fair/Bad/Very Bad	25	24	30	39	42

With regard to the association between neighbourhood deprivation and bonding social capital (see Table 6), significant differences were found in neighbourhood cohesion between the different areas.[17] Seventy-nine per cent of the respondents in the least deprived area and 80% of respondents in the second least deprived area agreed or tended to agree that their neighbourhood would pull together to improve the neighbourhood. In comparison, only 57% of respondents in the most deprived area agreed or tended to agree that their neighbourhood would pull together to do so.

Significant differences were also found in neighbourhood trust between the different areas.[18] Table 6 shows that 72% of the respondents in the least and second least deprived areas reported that they trusted many people in their area, compared to 44% and 42% in the most and second most deprived areas. Significant differences were also found in terms of civic participation, with individuals living in the least deprived areas being more involved in groups and organisations than those living in the most deprived areas.[19]

[16] $X^2(4)=26.582$, $p<0.001$

[17] $X^2(12)=49.429$, $p<0.001$

[18] $X^2(12)=85.024$, $p<0.001$

[19] $X^2(4)=17.616$, $p<0.001$

Table 6: Neighbourhood Deprivation and Bonding Social Capital (%)

	Least Deprived 1	2	3	4	Most Deprived 5
Neighbourhood Cohesion					
Definitely agree	22	28	27	16	17
Tend to agree	57	52	44	47	40
Tend to disagree	19	15	19	25	27
Definitely disagree	3	5	9	13	15
Neighbourhood Trust					
Many	72	72	61	42	44
Some	19	22	29	40	34
A few	9	5	10	17	17
None	0	1	1	2	5
Neighbourhood Belonging					
Very strongly	47	49	47	46	46
Fairly strongly	39	37	35	40	35
Not very strongly	11	12	16	12	16
Not at all strongly	3	3	2	2	3
Civic Participation					
Yes	66	64	59	54	48
No	34	36	41	46	52

There were no significant differences between the different areas in how strongly residents felt that they belonged to their neighbourhood.[20] In all five neighbourhood deprivation quintiles a clear majority of more than four out of five reported that they feel they fairly or very strongly belong to their neighbourhood (Table 6).

Bridging social capital appeared to vary substantially according to neighbourhood deprivation (Table 7). Eighty per cent of the respondents from the least deprived and second least deprived areas agreed and tended to agree that their area was a place where people from different backgrounds got on well together, while only 73% of respondents from the most deprived area and 70% of the second most deprived area did.[21]

[20] $X^2(12)=6.416$, $p=0.894$

[21] $X^2(16)=34.648$, $p<0.01$

Significant differences were found in social trust between the different areas.[22] More than half (53%) of the respondents from the least deprived area said that people can be trusted. This compared to 37% in the most deprived area (see Table 7).

Significant differences were also found with regard to the proportion of friends with similar incomes and the proportion of friends from the same ethnic group as the respondent.[23] In general, more deprived neighbourhoods appear to be more homogeneous in terms of the social relationships people have.

Table 7: Neighbourhood Deprivation and Bridging Social Capital (%)

	Least Deprived 1	2	3	4	Most Deprived 5
Inter-group Social Cohesion					
Definitely agree	16	26	18	11	19
Tend to agree	64	54	52	59	54
Tend to disagree	7	8	11	12	14
Definitely disagree	1	1	4	1	3
Don't know	13	12	16	16	10
Social Trust					
People can be trusted	53	50	47	40	37
You can't be too careful	47	50	53	60	64
Heterogeneous Relationships					
Similar Incomes					
All similar	35	39	44	42	40
More than a half	29	31	18	25	20
About/ Less than a half	36	31	38	34	40
Similar Ethnicity					
All similar	58	70	66	74	71
More than a half	36	23	24	18	22
About/ Less than a half	6	7	10	7	7

[22] $X^2(1)=14.134$, $p<0.01$

[23] $X^2(8)=16.478$, $p<0.05$ and $X^2(3)=18.490$, $p<0.05$, respectively

No significant differences were found for how often respondents contacted public officials or attended public meetings.[24] However, significant differences where found in political efficacy between the different areas.[25] Forty per cent of the respondents in the least deprived neighbourhoods felt that they can influence decisions affecting their local area, while only 30% of respondents in the most deprived neighbourhoods did so (see Table 8).

Table 8: Neighbourhood Deprivation and Linking Social Capital (%)

	Least Deprived 1	2	3	4	Most Deprived 5
Political Participation					
Contacted people					
Yes	26	28	26	21	20
No	75	72	75	79	81
Attended public meeting					
Yes	28	29	28	25	24
No	72	71	72	75	76
Political Efficacy					
Influence Local Decisions					
Definitely agree	4	9	6	3	3
Tend to agree	36	30	26	27	27
Tend to disagree	46	36	40	38	40
Definitely disagree	14	26	28	32	29
Political Trust					
Local Council					
A lot	8	7	5	6	8
A fair amount	58	52	50	46	40
Not very much	24	31	32	36	41
Not at all	10	10	13	12	10
Police					
A lot	32	33	27	26	24
A fair amount	58	48	52	49	43
Not very much	10	15	14	21	22
Not at all	1	4	7	4	11

[24] $X^2(4)=5.757$, $p=0.218$ and $X^2(4)=1.683$, $p=0.794$, respectively

[25] $X^2(12)=24.815$, $p<0.05$

Although there were no significant differences between the different areas in levels of trust in the local council, significant differences were found in levels of trust in the police.[26] When asked how much they trust the police, 1% of the respondents in the least derived neighbourhoods and 11% of respondents in the most deprived neighbourhoods said they do not trust the police at all, while 90% of respondents from the least deprived neighbourhoods and 67% from the most deprived area said they trust the police a lot or a fair amount.

Summary

This section has shown that self-reported health is strongly associated with neighbourhood deprivation: only one in four respondents reported poor health in the least deprived areas, whereas more than two out of five did so in the most deprived areas (*Research Question 1*).

This section has also shown that neighbourhood deprivation affects most aspects of bonding, bridging and linking social capital. People living in the more deprived neighbourhoods reported lower levels of neighbourhood cohesion, neighbourhood trust, and civic participation than those living in less deprived neighbourhoods. However, no significant differences were found for neighbourhood belonging. With regard to linking social capital,

People living in the more deprived neighbourhoods also reported lower levels of general trust and mutual respect between people from different backgrounds; and had more homogeneous relationships in terms of income and ethnicity. This suggests that levels of bridging social capital are lower in deprived areas in comparison to less deprived areas.

Neighbourhood deprivation also appeared to be related to different aspects of linking social capital. Despite there being no significant differences in political participation across neighbourhoods with different levels of deprivation, people living in the most deprived neighbourhoods were less likely to feel that they can influence decisions affecting their area and also expressed lower levels of political trust in their local council and the police. These results suggest that people living in the most deprived neighbourhoods are more disaffected with their experiences talking to public officials and/or attempts to influence the political system than those living in less deprived neighbourhoods.

[26] $X^2(12)=19.073$, $p=0.087$ and $X^2(12)=40.607$, $p<0.001$, respectively

Social Capital and Health

This section focuses on the associations between the different aspects of bonding, bridging and linking social capital and self-rated health in Wales (*Research Question 2*). It investigates if individuals with higher levels of social capital report better health than those with lower levels of social capital.

Table 9: Bonding Social Capital and Self-Rated Health

	Good/Very Good	Fair/Bad/Very Bad
Neighbourhood Cohesion		
Pull Together		
Agree (%)	71	29
Disagree (%)	64	36
Neighbourhood Trust		
Many/Some (%)	69	31
Few/None (%)	64	36
Neighbourhood Belonging		
Very strongly (%)	66	34
Fairly strongly (%)	71	29
Not very strongly (%)	70	30
Not at all strongly (%)	61	39
Civic Participation		
Yes (%)	76	24
No (%)	58	42

Table 9 shows the associations between the different indicators of bonding social capital and self-rated health. People who agreed that their neighbourhood pulls together to solve problems were more likely to report good health than those disagreeing.[27] Neighbourhood trust did not appear to be associated with self-rated health.[28] No significant health differences were found between those trusting many or some people in their neighbourhood and those trusting none or few people in their neighbourhood. Also, neighbourhood belonging was not associated with self-rated health.[29] No significant health differences were

[27] $X^2(1)=4.663$, $p<0.05$

[28] $X^2(1)=1.449$, $p=0.229$

[29] $X^2(3)=3.695$, $p=0.296$

found between those with different degrees of neighbourhood belonging. Table 9 further shows that civic participation is significantly associated with self-rated health.[30] Participants who took part in any group, club or organisation over the past 12 months were more likely to report good or very good health (76%) compared to those who had not taken part (58%).

Table 10 shows the associations between the different indicators of bridging social capital and self-rated health. There were no significant differences in self-reported health between participants agreeing (75%) and those disagreeing (68%) that people from different backgrounds get on well together in their community.[31] Social trust was also unrelated to the dichotomised self-rated health variable.[32] Participants thinking that most people can be trusted were almost equally as likely to report good/very good health (69%) as those thinking that you can't be too careful (67%).

Table 10: Bridging Social Capital and Self-Rated Health

	Good/Very Good	Fair/Bad/Very Bad
Inter-group Social Cohesion		
Agree (%)	75	25
Disagree (%)	68	32
Don't know (%)	65	35
General Trust		
People can be trusted (%)	69	31
You can't be too careful (%)	67	33
Heterogeneous Relationships		
Similar Incomes		
All similar (%)	66	34
More than a half (%)	75	25
About/ Less than a half (%)	71	29
Similar Ethnicity		
All similar (%)	66	34
More than a half (%)	77	23
About/ Less than a half (%)	77	24

[30] $X^2(1)=40.478$, $p<0.001$

[31] $X^2(2)=3.711$, $p=0.156$

[32] $X^2(1)=0.361$, $p=0.548$

Having friends having who do not have similar incomes or who are from other ethnic groups was positively associated with better self-reported health.[33] Seventy-one per cent of the respondents who said that 'about half' or 'less than half' of their friends had similar incomes (71%) and those who said that 'more than half' of their friends had similar incomes (75%) were more likely to report good or very good health than respondents who reported that 'all' of their friends had similar incomes (66%).

A similar pattern was found for the proportion of friends being of the same ethnic group (see Table 10). Seventy-seven per cent of the respondents who said that 'about half' or 'less than half' of their friends, and a similar percentage of those reporting that 'more than half' were from similar ethnic backgrounds reported that their health was good or very good. Only 66% of the respondents who said that 'all' of their friends were from a similar ethnic background reported that their health was good or very good.

Table 11 shows the associations between the different indicators of linking social capital and self-rated health. There were no significant differences in self-rated health between respondent who had or had not contacted public officials.[34] Similarly, there were no significant differences between those who had or had not attended a public meeting, rally, public demonstration or protest, or signed a petition in the last 12 months; although this relationship approached significance.[35]

Political efficacy was positively associated with self-reported health.[36] . Seventy-six per cent of the participants who felt that they could 'very strongly' influence local decisions reported having good or very good health, while only 59% of the participants who felt that they could 'not at all strongly' influence local decisions reported having good or very good health.

Respondents who said they trusted their local council were more likely to report good health. Whereas 72% of the respondents who trusted their local council reported good or very good health, 64% of the respondents who did not trust their local council did. There as no significant difference between respondents who did, and did not, trust the police.[37]

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[33] $X^2(2)=5.885$, $p<0.05$; and $X^2(2)=12.529$, $p<0.01$, respectively

[34] $X^2(1)=0.767$, $p=0.381$

[35] $X^2(1)=3.625$, $p=0.057$

[36] $X^2(1)=20.442$, $p<0.001$

[37] $X^2(1)=6.480$, $p<0.05$ and $X^2(1)=2.020$, $p=0.155$, respectively

Table 11: Linking Social Capital and Self-Rated Health

	Good/Very Good	Fair/Bad/Very Bad
Political Participation		
Contacted People		
Yes (%)	66	34
No (%)	69	31
Attended Public Meeting		
Yes (%)	73	27
No (%)	67	33
Political Efficacy		
Influence Local Decisions		
Very strongly (%)	76	24
Fairly strongly (%)	74	26
Not very strongly (%)	72	28
Not at all strongly (%)	59	41
Political Trust		
Local Council[1]		
Yes (%)	72	28
No (%)	64	36
Police[1]		
Yes (%)	70	30
No (%)	65	35

Note: [1] yes = A lot/A fair amount; no = Not very much/Not at all

Summary

This section examined the associations between the different aspects of bonding, bridging, and linking social capital and self-rated health. The results were somewhat mixed, as only a limited number of aspects appeared important. In regards to bonding social capital, only neighbourhood cohesion and civic participation were associated with self-rated health. Respondents who agreed that they live in an area which pulls together to solve problems were more likely to report better health in comparison to those who disagreed. Similarly, those who took part in any group, club or organisation over the past 12 months were more likely to report good health than those who had not done so. Neighbourhood trust and belonging were not significantly associated with self-reported health.

Of the bridging social capital indicators, only the '*heterogeneous relationships'* variables were significantly associated with self-rated health. Those who reported more homogeneous social relationships in terms of ethnicity and income were generally less likely to report good health than those who reported more heterogeneous social relationships. General social trust and 'intergroup social cohesion' (whether people from different backgrounds get on well together) did not appear to be associated with people's self-reported health.

The aspects of linking social capital that appeared to be important for community health were *political efficacy* and *political trust*. In particular, participants who felt they could 'not at all strongly' influence decisions affecting their local area were less likely to report good or very good health. Respondents who trusted their local council were more likely to report good health than those who did not trust their local council.

Social Capital and Neighbourhood Resilience

In order to examine whether different aspects of bonding, bridging and linking social capital contribute to community resilience by buffering the detrimental health effects of neighbourhood deprivation (*Research Question 3*), a series of *two-factor analysis of variance* (ANOVA) were conducted. Potential buffering effects are indicated by interactions between neighbourhood deprivation and social capital in individual self-rated health.

Bonding Social Capital and Neighbourhood Resilience

Two indicators of bonding social capital were considered in these analyses, namely the degree to which the respondents felt that people in their neighbourhood pull together to improve the neighbourhood (*neighbourhood cohesion*) –as an indicator of neighbourhood cohesion- and whether or not the participant is involved in any group, club or organisation (*civic participation*). These aspects of social capital were selected as they were associated with neighbourhood deprivation as well as self-reported health.

A significant main effect was found for neighbourhood deprivation and a *near significant* main effect for bonding social capital.[38] Furthermore, there was a significant interaction effect between neighbourhood deprivation and bonding social capital (*neighbourhood cohesion*) in individual self-rated health.[39] The interaction effect suggests that this aspect of bonding social capital buffers against the health effects on neighbourhood deprivation. However, the effects are somewhat different than expected. Figure 3 shows that neighbourhood cohesion is mainly beneficial for non-deprived communities. That is, respondents living in the least deprived neighbourhood who think that their neighbourhood is cohesive are less likely to report poor health than the respondents from these neighbourhoods who think that their neighbourhood is not cohesive. Conversely, respondents living in the most deprived neighbourhood who think that their neighbourhood is cohesive are more likely to report poor health than the respondents from these neighbourhoods who think that their neighbourhood is not cohesive. This suggests that bonding social capital may not necessarily be beneficial for community health in the most deprived neighbourhoods.

[38] $F(4, 1007)=2.791$, $p<0.05$ and $F(1, 1007)=3.733$, $p=0.054$, respectively

[39] $F(4, 1007)=2.842$, $p<0.05$

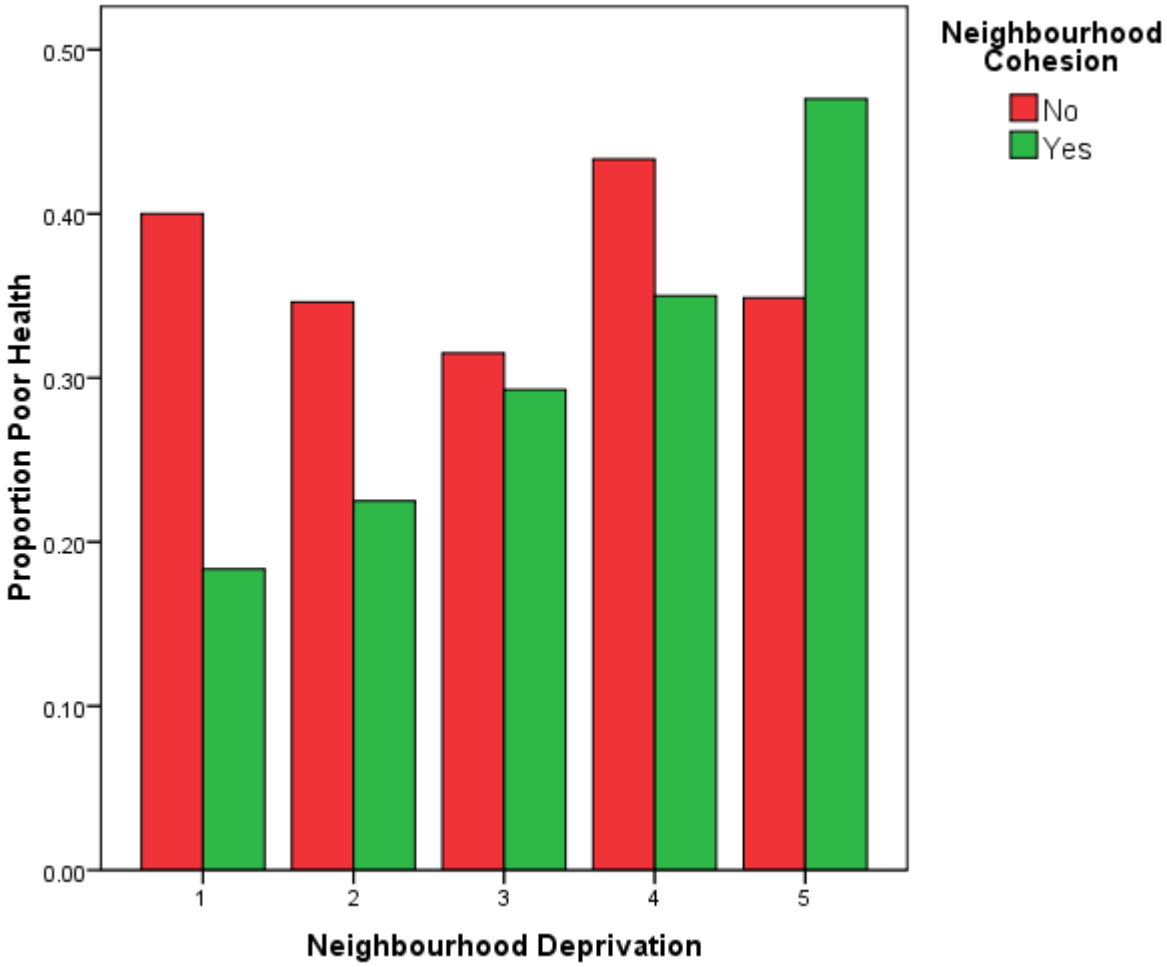

Figure 3: Neighbourhood Deprivation, Bonding Social Capital (Neighbourhood Cohesion), and Individual Self-Rated Health

Figure 4 shows the association between neighbourhood deprivation, bonding social capital (*civic participation*) and individual self-rated health. Significant main effects were found for neighbourhood deprivation as well as for bonding social capital as indicated by civic participation.[40] However, no significant interaction was found between neighbourhood deprivation and civic participation in terms of individual self-rated health.[41] In all cases people who are taking part in groups, clubs or organisations were less likely to report poor health. This suggests that civic participation has individual health benefits, but does not help to buffer against the detrimental effects of neighbourhood deprivation

[40] F(4, 1086)=4.995, p<0.001 and F(1, 1086)=31.074, p<0.001, respectively

[41] F(4, 1086)=1.080, p=0.365

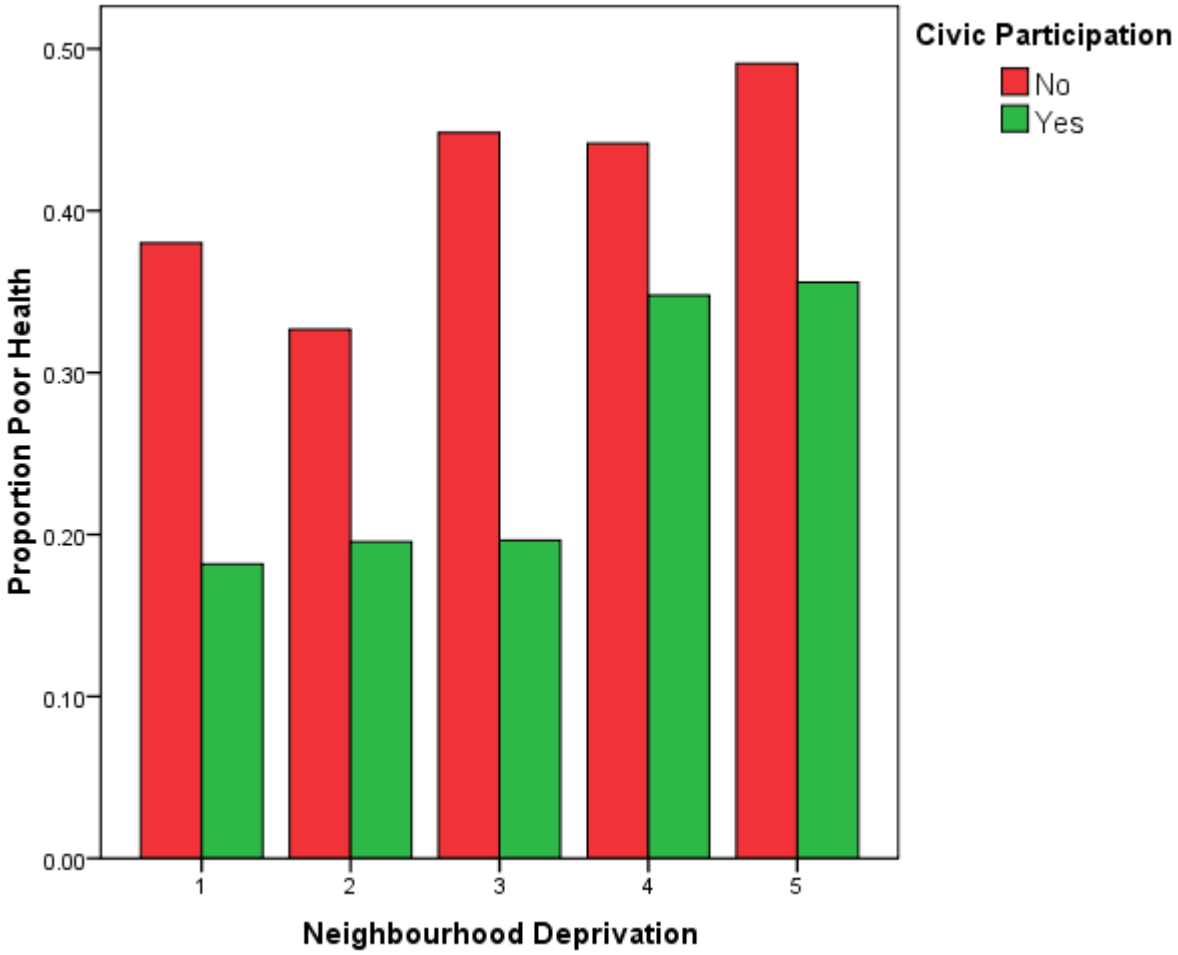

Figure 4: Neighbourhood Deprivation, Bonding Social Capital (Civic Participation), and Individual Self-Rated Health

Bridging Social Capital and Neighbourhood Resilience

The indicators of bonding social capital that were used in the analyses were the proportion of friends that the respondents have who have similar incomes (*heterogeneous relationships - income*) and the proportion of friends who are from the same ethnic group as themselves (*heterogeneous relationships –ethnicity*). The responses were subdivided into three groups, i.e., (1) all friends had similar incomes/were of the same ethnic group, (2) more than a half of friends had similar incomes/were of the same ethnic group, and (3) half or less of friends had similar incomes/were of the same ethnic group. Both reflect the degree to which individuals have heterogeneous relationships, one of the components of bridging social capital.

A significant main effect was found for neighbourhood deprivation but not for the *heterogeneous relationships -income* variable.[42] Furthermore, no significant interaction effect was found for neighbourhood deprivation and bridging social capital as indicated by the proportion of friends with similar incomes.[43] These results suggest that heterogeneous relationships in terms of income reflect differences in deprivation; and do not independently contribute to community health and resilience.

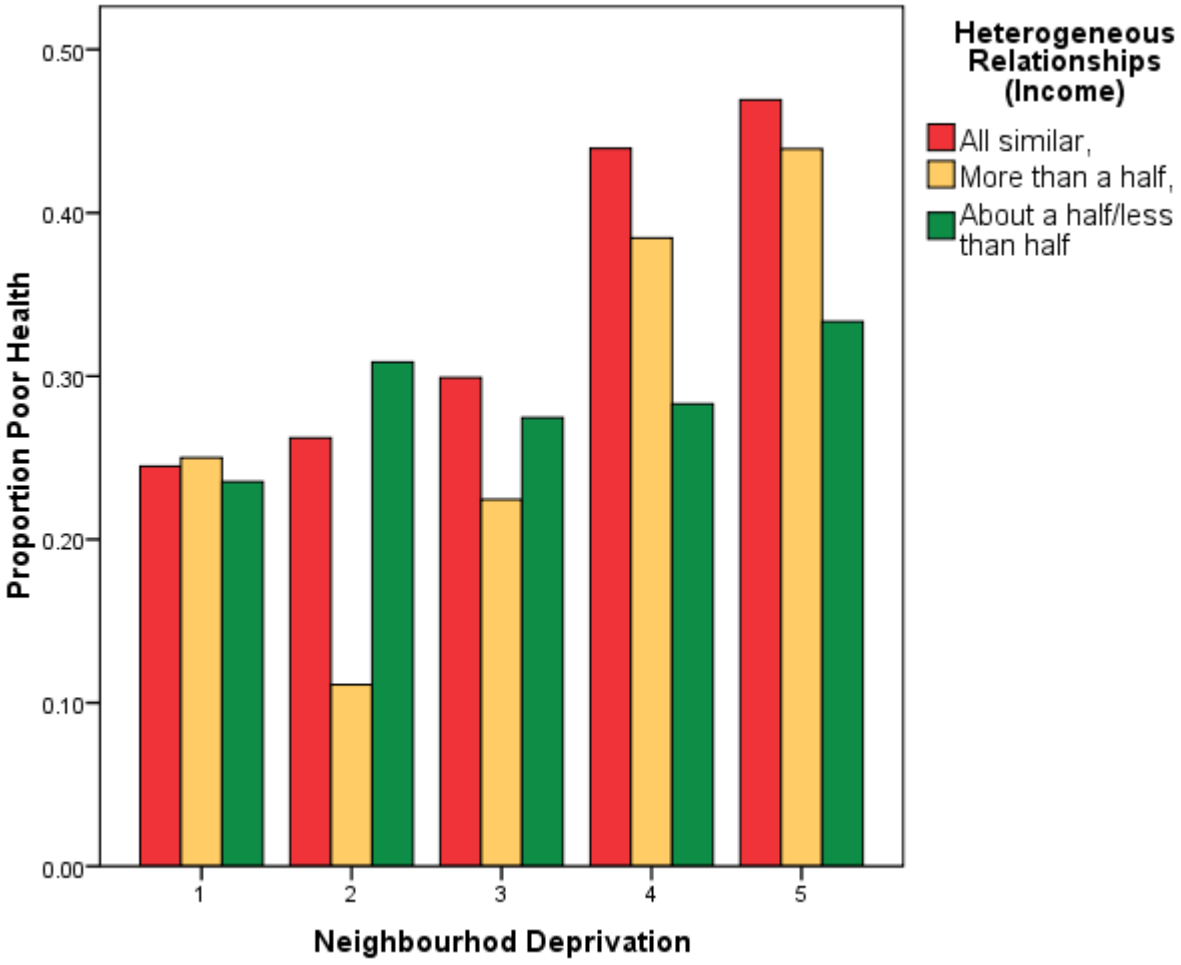

Figure 5: Neighbourhood Deprivation, Bridging Social Capital (Heterogeneous Relationships -Income), and Individual Self-Rated Health

[42] F(4, 1019)=6.314, p<0.001 and F(2, 1019)=1.883, p=0.153, respectively

[43] F(8, 1019)=1.470, p=0.164

This study found a main effect for bridging social capital, with respondents with more ethnically diverse friendships reporting better health than those with more ethnically homogeneous networks (see Figure 6).[44] A significant interaction was found between neighbourhood deprivation and this indicator of bridging social capital.[45] Having ethnically diverse friendships appears to have a buffering effect on the association between neighbourhood deprivation and health; with people living in the most deprived neighbourhoods reaping the most benefits. Respondents in those areas were less likely to report poor health if half or less than half of their friends were from the same ethnic group. Conversely, respondents living in the least deprived neighbourhoods were less likely to report poor health if all friends were of the same ethnic group. The main effects of neighbourhood deprivation (see previous section) were rendered non-significant when the main effect of bridging social capital and the interaction effect were taken into account.[46]

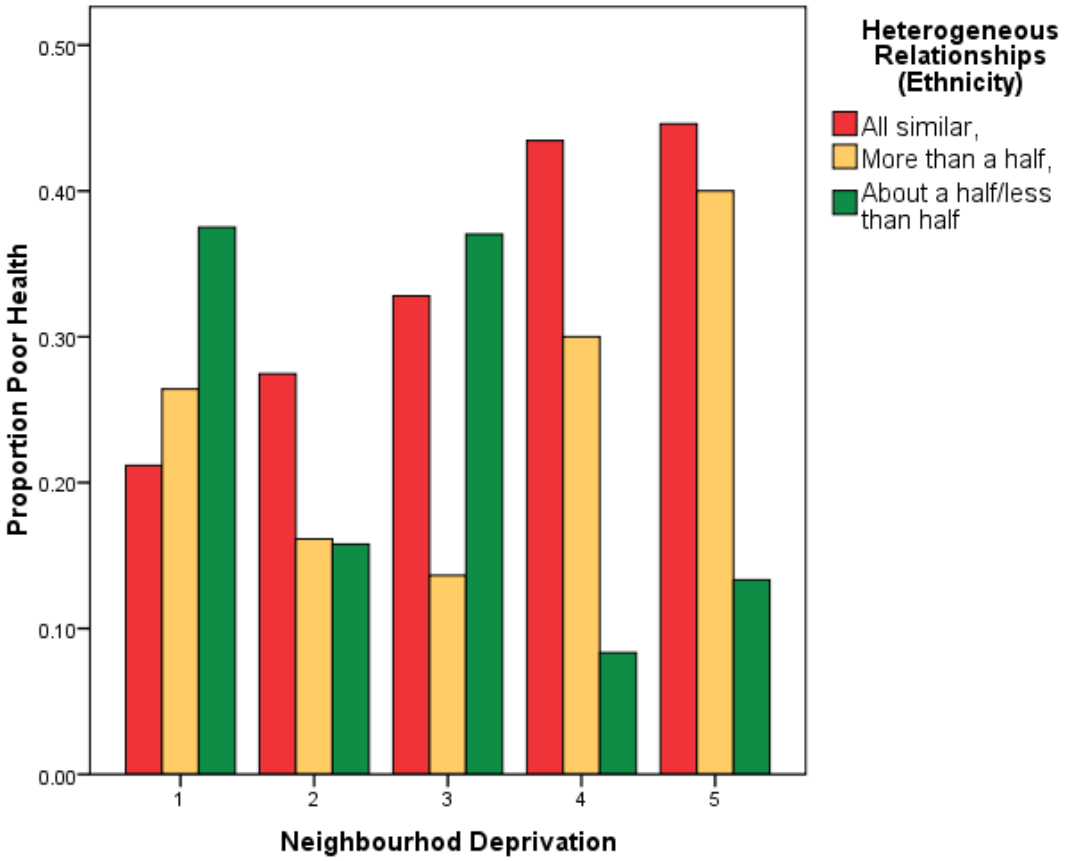

Figure 6: Neighbourhood Deprivation, Bridging Social Capital (Heterogeneous Relationships -Ethnicity), and Individual Self-Rated Health

[44] F(2, 1056)=4.511, p<0.05

[45] F(8, 1056)=2.229, p<0.05

[46] F(4, 1056)=1.156, p=0.392

Linking Social Capital and Neighbourhood Resilience

Two indicators of linking social capital were used in the analyses: the degree to which people feel they can influence decisions affecting your local area (*political efficacy*) and how much they trust their local council (*political trust*).

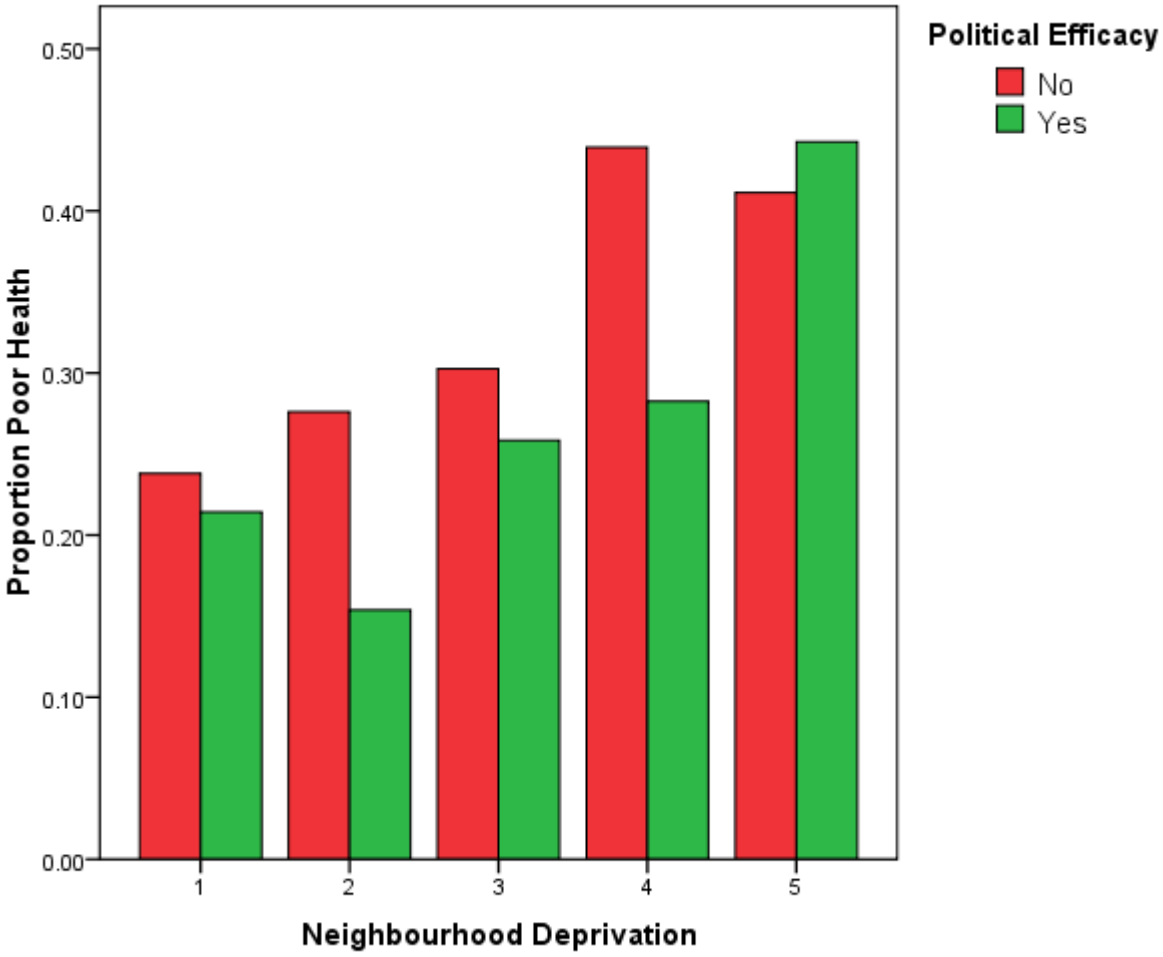

Figure 7: Neighbourhood Deprivation, Linking Social Capital (Political Efficacy), and Individual Self-Rated Health

Figure 7 shows that, while there were main effects for neighbourhood deprivation and political efficacy, there was no significant interaction effect between neighbourhood deprivation and political efficacy in terms of self-rated health.[47] These results show that political efficacy is beneficial for individual health, but does not help to buffer against the negative effects of neighbourhood deprivation.

[47] F(4, 1026)=7.068, p<0.001; F(1, 1026)=4.137, p<0.05; and F(4, 1026)=1.157, p=0.328, respectively.

A significant main effect was found for neighbourhood deprivation, but not for political trust.[48] Also a significant interaction effect was found between neighbourhood deprivation and political trust, showing that the association between neighbourhood deprivation and individual self-rated health is moderated by the level of political trust in the local council.[49] Political trust appears to be mainly beneficial for those living in 'intermediate' neighbourhoods in terms of deprivation. Figure 8 shows that participants with high levels of trust living in the second, third, and fourth quintile were *less* likely to report poor health than those with low levels of political trust living in the same neighbourhoods. However, participants with high levels of trust living in the first (least deprived) and fifth quintile (most deprived) neighbourhoods were *more* likely to report poor health than those with low levels of political trust living in the same neighbourhoods.

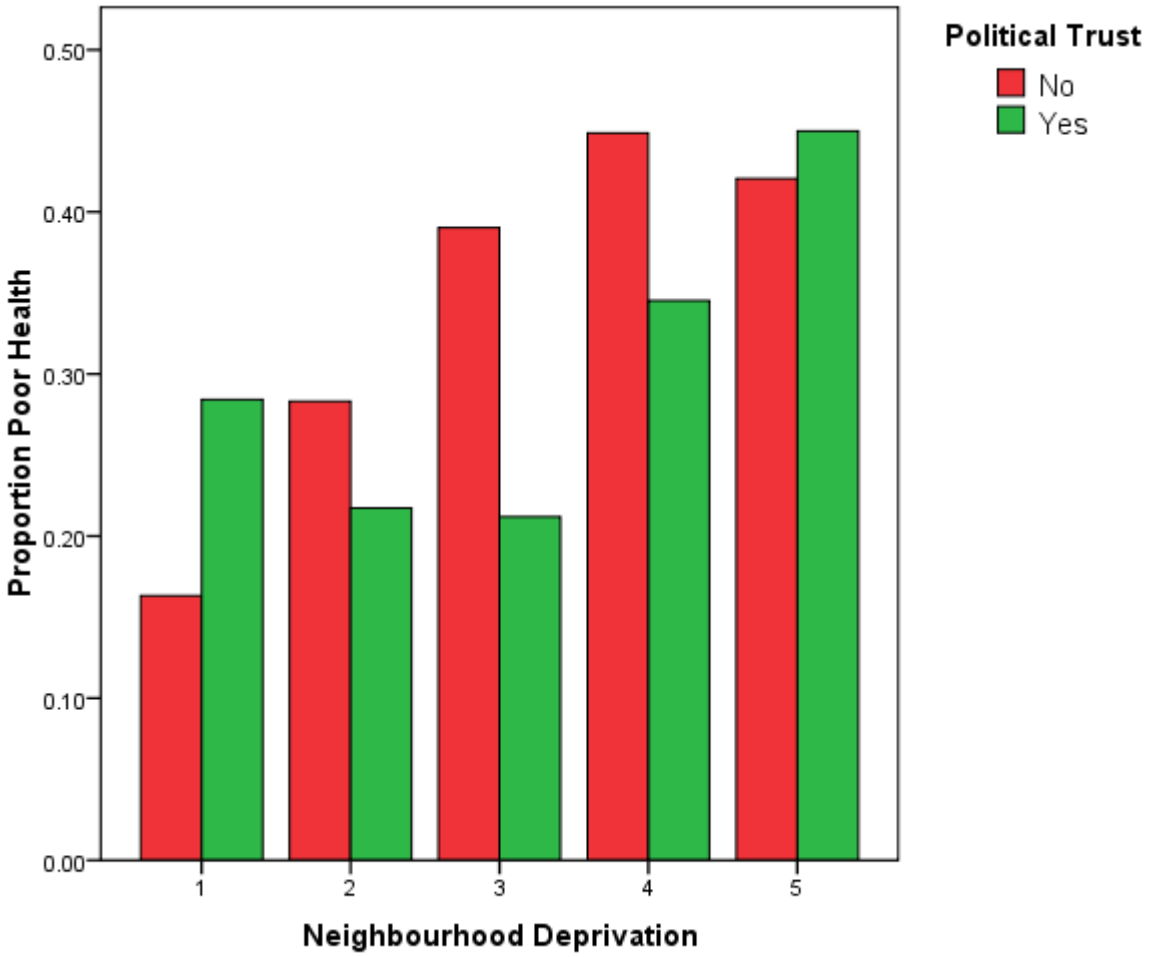

Figure 8: Neighbourhood Deprivation, Linking Social Capital (Political Trust), and Individual Self-Rated Health

[48] F(4, 1051)=7.517, p<0.001 and F(1, 1051)=1.773, p=0.183, respectively

[49] F(4, 1051)=2.986, p<0.05

Summary

This part of the results section investigated which aspects of bonding, bridging and linking capital contribute to community resilience by buffering the detrimental impacts of neighbourhood deprivation. The results are somewhat 'patchy', with only a limited number of indicators interacting significantly with neighbourhood deprivation, suggesting that the buffering effects of the different types of social capital are limited. The results further suggest that different forms of social capital may contribute to community resilience in different ways.

The only aspect of bonding social capital that appeared to contribute to community resilience is *neighbourhood cohesion*. However, the effects found were somewhat different from previous research (e.g., Fone et al., 2007). The findings from this report suggest that this aspect of bonding social capital appeared to be mainly beneficial for non-deprived communities. Although *civic participation* (taking part in groups, clubs or organisations) was found to have individual health benefits, it does not help to buffer against the detrimental effects of neighbourhood deprivation. Also the other aspects of bonding social capital (not reported here) did not significantly interact with neighbourhood deprivation.

The contribution of bridging social capital to community resilience appeared to be minimal. Only *ethnically heterogeneous relationships* appeared to buffer against the detrimental impacts of neighbourhood deprivation. That is, people with ethnically diverse friendships living in the most deprived neighbourhoods were less likely to report poor health than those with less ethnically diverse friendships living in the same neighbourhoods. The other aspects of bridging social capital (not reported here) were not found to moderate the association between neighbourhood deprivation and individual self-rated health.

Linking social capital contributes to community resilience in a different way. Although there was a significant interaction effect between neighbourhood deprivation and *political trust*, this aspect of linking social capital appeared mainly beneficial for those living in 'intermediate' neighbourhoods in terms of deprivation. Other aspects of linking social capital, such as political efficacy, were not found to moderate the association between neighbourhood deprivation and self-rated health.

Discussion

This study examined how social aspects of the neighbourhood environment contribute to community wellbeing and resilience in Wales. This was done by using the bonding, bridging, and linking social capital framework of Szreter and Woolcock (2004) and data from the 2007 and 2009 Citizenship Survey. In line with previous research, this study found that living in deprived neighbourhoods is detrimental to people's health and wellbeing. People living in the most deprived neighbourhoods were the least likely to report good health. In addition, they reported the lowest levels of bonding social capital (*neighbourhood cohesion*, *neighbourhood trust*, and *civic participation*), bridging social capital (*intergroup social cohesion*, *general social trust*, and *heterogeneous relationships*), and linking social capital (*political efficacy* and *political trust*); although neighbourhood deprivation did not affect neighbourhood belonging and political participation (see Table 12).

Table 12: Summary of results

SOCIAL CAPITAL TYPE	ASPECT	DEPRIVATION	HEALTH	RESILIENCE
BONDING	*Neighbourhood Cohesion*	+	+	+
	Neighbourhood Trust	+	—	—
	Neighbourhood Belonging	—	—	—
	Civic Participation	+	+	—
BRIDGING	*Intergroup Social Cohesion*	+	—	—
	Social Trust	+	—	—
	Heterogeneous Relationships	+	+	+
LINKING	*Political Participation*	—	—	—
	Political Efficacy	+	+	—
	Political Trust	+	+	+

Note: + significant association; — non-significant association.

A range of bonding, bridging and linking social capital indicators were found to be important for community health. In regards to bonding social capital, both *neighbourhood cohesion* and *civic participation* were associated with self-rated health. Of the bridging social capital indicators only '*heterogeneous relationship'* aspects were significantly associated with self-rated health. Aspects of linking social capital that appeared to be important for people's health were *political efficacy* and *political trust* (see Table 12).

The results were somewhat mixed as to whether bonding, bridging and linking social capital contribute to community resilience by moderating the detrimental impacts of neighbourhood deprivation. Although a number of interaction effects were found for *neighbourhood cohesion*, *heterogeneous relationships*, and *political trust* (see Table 12), the results were not completely in line with the expectations that higher levels of social capital provide a buffer for those living in the most deprived neighbourhoods. The respective aspects of bonding, bridging, and linking appeared to contribute to community resilience in different ways. Whilst neighbourhood cohesion appeared to mainly benefit people living in the least deprived neighbourhoods, having ethnically diverse friendships (heterogeneous relationships) was the most beneficial for people living in the most deprived neighbourhoods. Trust in the local council appeared to be most beneficial for those living in 'intermediate' neighbourhoods. The other aspects of social capital did not appear to contribute to neighbourhood resilience.

Overall, this study highlights the diverse nature of social capital and their workings in contributing to community health and resilience. Neighbourhood deprivation has widespread implications for community health and appears to affect the social fabric of these areas. Not only do respondents living in the most deprived areas report the worst health, they also report significantly lower levels of bonding, bridging and linking social capital. Furthermore, the study has shown that bonding, bridging and linking social capital all contribute to community health and resilience. The most important aspects were *neighbourhood cohesion*, *heterogeneous relationships*, and *political trust*, as these contributed both to community health and community resilience (see Table 12). However, their contributions to community resilience were quite different, with social cohesion mainly benefitting people in the *least* deprived neighbourhoods, political trust mainly benefitting people in *intermediately* deprived neighbourhoods, and heterogeneous ethnic friendships mainly benefitting people in the *most* deprived neighbourhoods

The results of this study should be interpreted with caution. First and foremost, the data used in this study is cross-sectional. It is therefore not possible to make any causal claims from the findings. Although it is assumed that the different aspects of social capital contribute to community health and resilience, it is also possible that individuals report lower levels of social capital because they have poorer health; or that how people view their health will influence how they interact with others. For example, people with poorer health may have fewer opportunities to interact with others and as a result report lower levels of social cohesion, civic participation, and/or heterogeneous relationships. Longitudinal work would be better suited to explore the causal relationships between neighbourhood deprivation, social capital and health. Second, the items that were used to measure the different aspects of bonding, bridging and linking social capital were not specifically developed for this purpose, and should therefore only be considered as general indicators. Third, the sample size of this study was relatively small, as it only included Welsh respondents. A larger sample size would produce more robust estimates of the parameters and would allow for more complex analyses, including potential interactions between the different aspects of social capital. Finally, the study looked at the role of different aspects of social capital as potential buffers against the negative impacts of deprivation. Although it is well known that neighbourhood deprivation affects health over and above individual socio-economic status, the current study did not adjust for differences in individual socio-economic status. It is therefore possible that the deprivation effects reflect individual socio-economic differences.

There is still a lively debate as to whether social capital operates at the individual and/or community level. It is plausible that individuals directly benefit from their own social assets; and contribute to community resilience at same time. Further research is needed to establish these processes and the levels at which they operate. Although there are some caveats to consider when interpreting the results (as discussed above), the findings show that the social capital framework of Szreter and Woolcock (2004) is useful for analysing the data, and that further research is warranted to examine how different social aspects of the neighbourhood environment may help to build community resilience. In particular considering how the different aspects of social capital contribute to community resilience could be addressed. Future research should further explore how the different aspects interact in their contributions to community resilience. In the current study the different aspects of social capital were considered separately. However, a larger purposively designed study is needed to provide important new insights into how different aspects of the social environment work together to contribute to community health and resilience.

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Appendix A

The 2007 and 2009 Citizenship Survey

In this research we combine the Welsh responses of the *2007 and 2009 Citizenship Survey.* This is carried out in order to identify the social aspects of the neighbourhood environment which may help to buffer against the negative impacts of deprivation in Welsh communities. Conducted since 2001, the *Citizenship Survey* is a biennial survey covering the adult population of England and Wales. The survey provides an evidence base for the work of Communities and Local Government. The survey is also used more widely by other government departments and external stakeholders to help inform their work around the issues covered in the survey. The Citizenship Survey covers the following topics:

- identity and social networks
- feelings about the community, including community cohesion
- trust and influence
- volunteering
- civic engagement
- race and religious prejudice, and perceptions of discrimination
- religion
- mixing between people of different backgrounds
- values

Various questions on these topics can be used as indicators of *bonding, bridging and linking social capital* (see *Measures* section). The Citizenship Survey further includes the widely-used *self-rated health* measure, which has been shown to be a valid indicator of general wellbeing and a predictor of mortality (Idler & Benyamini, 1997), as well as the *Welsh Index of Multiple Deprivation* (WIMD).

The Citizenship Survey collects information from adults in England and Wales through face-to-face interviews of a regionally representative sample of 10,000 adults (16 and over), plus a 5,000 minority ethnic boost sample, using a *multistage sampling strategy*. Of the core sample, approximately 500 interviews are usually conducted in Wales. Such a sample size is too small to conduct the analyses needed for the proposed research. Therefore we combine the Welsh responses of the *2007 and* the *2009 Citizenships Survey*, creating an overall Welsh dataset of 1,099 respondents (532 + 567 respondents, respectively). The data is freely available for academic research from the *UK Data Archive*.

Measures

Self-Rated Health

The main outcome variable is the widely-used *self-rated health* measure. Respondents were asked to "How is your health in general? Would you say it is.": "Very Good", "Good", "Fair", "Bad", and "Very Bad". This self-rated health measure has been validated as a good predictor of mortality, and is found to be relatively insensitive to differences in the wording of the question (Idler & Benyamini, 1997). To simplify the analyses, the scale was dichotomised with 1 representing fair, poor, and very poor health and 0 good or very good health.

Bonding Social Capital

Bonding Social Capital was represented by a number of items reflecting the different aspects of social cohesion, neighbourhood trust, neighbourhood belonging, and civic participation (see Table 1). *Social Cohesion* was measured by asking respondents "To what extent do you agree or disagree that people in this neighbourhood pull together to improve the neighbourhood?" Respondents could answer on a 4-point scale of "definitely agree", "Tend to agree", "Tend to disagree", and "Definitely agree". Respondents were also offered a "Don't know" option. *Neighbourhood Trust* was measured by the item "How many people in your neighbourhood can be trusted?", with "many of the people in your neighbourhood can be trusted", "some can be trusted", "a few can be trusted", and "none of the people in your neighbourhood can be trusted" as the answer options. *Neighbourhood Belonging* used the item "How strongly do you belong to your neighbourhood". The 4-point response scale included the options "Very strongly", "Fairly strongly", "Not very strongly", and "Not at all strongly". People could also respond with "Don't know". *Civic Participation* was measured by asking people whether they have taken part in, supported, or had helped groups, clubs or organisations in any way during the last 12 months. A list of 16 organisations was shown by the interviewers, including an "other option". These 16 organisations were added up to identify participants who have been involved in "none", "one", "two", or "three or more".

Bridging Social Capital

Bridging Social Capital was represented by a number of items reflecting the different aspects of social cohesion/mutual respect, social trust, and heterogeneous relationships (see Table 1). *Social Cohesion/Mutual Respect* across different social groups was measured by the question "To what extent do you agree or disagree that this local area (…) is a place where people from different backgrounds get on well together?" Responses were made on a 4-point agree-disagree scale. To measure *Social Trust*, respondents were asked to what extent they think that (a) "most people can be trusted", or that (b) "you can't be too careful in

dealing with people?" Two questions were used to measure *Heterogeneous Relationships* in terms of socio-economic position and ethnicity, respectively: "What proportion of your friends have similar incomes to you?" and "What proportion of your friends are of the same ethnic group as you?" Both questions had the answer options "all the same", "more than a half", "about a half", and "less than a half?" The latter two categories were combined due to low numbers.

Linking Social Capital

Linking Social Capital was represented by a number of items reflecting the different aspects of political participation, political efficacy, and political trust (see Table 1). *Political Participation* was measured by two questions. First, respondents were asked if in the last 12 months they had contacted any political representatives, such as a Local Councillor, Member of Parliament, or public official working for the local council or National Assembly for Wales. People were subdivided into groups that had and had not done so. Second, they were asked if they had attended a public meeting or rally, taken part in a public demonstration or protest or signed a petition in the last 12 months. Again, a distinction was made between people who had and had not done so. Using a 4-point agree-disagree scale, *Political Efficacy* was measured by asking respondents to what degree they agree or disagree that they can influence decisions affecting their local area. They were also offered a "Don't know" option. *Political Trust* was measured by asking respondents to what extent they trust their local council and the police respectively, with the response options being "A lot", "A fair amount", "Not very much", and "Not at all".