# Access to social capital and the course of depression:
# A prospective study

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**Old man in sorrow (on the threshold of eternity)**

Vincent van Gogh, 1890

# Abstract

Depression is a significant clinical problem. Social factors such as poverty and unemployment, interpersonal difficulties, poor housing conditions and the absence of positive events are related to lower rates of recovery. Social capital, defined as resources embedded in social networks, may also be related to recovery. However, social capital research methodologies are in their infancy and little evidence of positive associations currently exists. This study extends our knowledge by validating a measure of individual social capital and testing the hypothesis that people with depression with access to more social capital will improve more over six months than those with less.

Focus groups, an expert panel and a series of field tests validated the Resource Generator-UK for use in the UK general population. This instrument is a measure of access to network resources across multiple domains. Item reduction and scaling using item response theory and standard psychometric testing demonstrated the instrument to be valid and reliable for the UK.

A prevalent cohort of people with depression was recruited from primary care (n=173) and followed up for 6 months (follow-up rate = 91.3%). Depression was measured using the Hospital Anxiety and Depression (HAD) scale alongside a large number of potential covariates. Multivariate analysis of covariance found that a univariate association between improvement in HAD scores and access to expert advice became non-significant. Baseline HAD scores, emotional support and level of education were predictors of change in depression scores in the multivariate model. When change in subjective quality of life was used as the outcome, a different model emerged in which an interaction of access to social capital and attachment style was significantly related to change in quality of life alongside multiple covariates. Results are discussed in the light of existing findings and recommendations are made for clinical practice and further research.

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# Glossary of Abbreviations

AIC          Akaike's Information Criterion

CIDI        Composite International Diagnostic Interview

CPQ        Close Persons Questionnaire

GHQ        General Health Questionnaire

GP           General Practitioner

HAD        Hospital Anxiety and Depression Scale

IAPT        Improving Access to Psychological Therapies

LTE-Q     List of Threatening Experiences Questionnaire version

MANSA   Manchester Short Assessment of Quality of Life

MHM      Monotone Homogeneity Model

MHSW    Mental Health Social Worker

MSP        MSP5 for Windows

NICE        National Institute for Health and Clinical Excellence

OR           Odds ratio

PCT         Primary Care Trust

RG-UK     Resource Generator-UK

PG-UK     Position Generator-UK

SOC        Standard Occupational Classification

SPSS      Statistical Package for the Social Sciences

SSND     Social Survey of the Networks of the Dutch

UK           United Kingdom

US           United States of America

WHO       World Health Organisation

## Publications arising from this thesis (Appendix F)

Webber, M. & Huxley, P. (2004) Mental health and social capitals (letter). British Journal of Psychiatry, 184, 185-186.

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# Chapter 1

# A conceptual review of social capital and depression

# 1   A conceptual review of social capital and depression

## 1.1   Introduction

Social capital refers to the social context of people's lives. It is a multi-dimensional concept that variously encompasses other concepts such as trust (Coleman, 1988); civic engagement, social norms and reciprocity (Putnam, 1993); features of social structures and networks (Lin, 2001); and the resources embedded within them (Bourdieu, 1986). Social scientists, policy makers and clinicians have seized upon the concept as a panacea for the post-modern disintegration of grand social theory. It has consequently been applied to fields as diverse as sustainable development (van Bastelaer, 1999), democracy and governance (Putnam, 1993) and public health (Kawachi et al., 1997).

It has been suggested that social capital can facilitate recovery from mental health problems (Sartorius, 2003), although the robustness of the theory and evidence supporting this assertion has been questioned (Henderson and Whiteford, 2003). This is partly due to the concept of social capital having multiple definitions and dimensions, which remain the subject of ongoing debates (McKenzie and Harpham, 2006a), creating a conceptual minefield that is almost too treacherous to explore.

This introductory chapter treads a careful path through this contested territory to clarify the conceptual origins of social capital to identify the extent to which it is a metaphor or a social theory. It makes the case for the existence of two distinct social capitals rather than one unified concept (Webber and Huxley, 2004), an idea which is now receiving wider currency (Kawachi, 2006; Kawachi et al., 2007). It critiques the two broad conceptual approaches that have been identified: social capital as a neo-capital theory and a communitarian approach. It also seeks to establish possible mechanisms between the phenomena and the course of depression, which is often lacking in empirical studies of this nature (Smith and Lynch, 2004), thus establishing the theoretical context of this study. Firstly, though, it summarises the epidemiology of depression to highlight the need for further research into social factors that may assist recovery.

## 1.2 Epidemiology of depression

### 1.2.1 Models

The term 'depression' describes a continuum of human experiences from unhappiness through to a desire to end one's life. The imposition of cut points to delineate 'clinical' depression from 'normal' unhappiness can be rather arbitrary (Melzer et al., 2002). However, to facilitate its treatment, psychiatry has defined categorical models of depression.

The *International Classification of Diseases* (World Health Organisation, 1992) and the *Diagnostic and Statistical Manual* (American Psychiatric Association, 1994) set out the criteria for a diagnosis of depression. A specific number of symptoms such as persistent low mood, loss of pleasure or interest and insomnia, of specified severity, have to be present for at least two weeks to receive this diagnosis. Although arguably rather arbitrary, diagnostic labels do perform many valuable roles, including facilitating the comparison of the mental health of different populations, assisting clinicians with treatment regimes and providing a degree of certainty to patients.

An alternative approach is to consider dimensional models of common mental disorders based on identifying the underlying latent traits of depression and anxiety (Goldberg and Huxley, 1992). Symptom dimensions are obtained through a 'bottom-up' analysis of sets of symptoms in a large number of respondents, a method which allows comparison between cultural groups who may understand depression differently.

An anthropological perspective on depression draws on the linguistic terms 'phonetic' and 'phonemic', referred to as 'etic' and 'emic' respectively, to distinguish between different approaches. An etic model of depression is derived from the view that:

> "basic psychopathology is universal and that cross-cultural differences have derived mainly from culture-specific illness behaviour" (Cheng, 2001: 1).

For example, somatisation has been reported to be a characteristic feature of depression in non-Western cultures (World Health Organisation, 1983). The etic approach views somatisation as affecting the way in which depression presents rather than being an underlying core feature of the disorder. A mental disorder such as

depression is therefore universal and Cheng (2001) argues that there is no solid evidence for a real difference in prevalence across cultures.

In contrast, the 'emic' approach views psychopathology as:

> "culture specific … and intrinsically connected to the social and political realities of that culture" (Patten, 2003: 714).

Proponents of the 'emic' approach argue that the universal application of definitions developed in one or two cultures involves a degree of ethnocentricity. This is a particular concern for epidemiologists as depression cannot be measured directly. Respondents make a judgement about what they are experiencing and subjectively describe this to researchers, assuming that they are willing to discuss it at all. Cultural beliefs about the normality of experiences will affect their reporting. These concerns need to be considered in international comparisons of the prevalence of depression (Patten, 2003)

### 1.2.2    Prevalence

### 1.2.2.1    Global burden of depression

Irrespective of the competing approaches to understanding depression, it is widely agreed that it presents a significant global social and economic problem (Luppa et al., 2007; Sartorious, 2001).   Projections indicate that it is likely to become the second largest global cause of disability by 2020 (Murray and Lopez, 1997). In England in 2000 the total cost of depression in terms of treatment, lost earnings and premature death was estimated at over £9 billion (Thomas and Morris, 2003). Including benefit payments, this was estimated to be as much as £17 billion in the United Kingdom (UK) in 2006 (Layard, 2006). In Europe in 2004 it was estimated at €118 billion, or 1% of Europe's economy (Sobocki et al., 2006).

### 1.2.2.2    Community prevalence

An international systematic review of prevalence studies of mood disorders conducted between 1980 and 2000 (Waraich et al., 2004) found best estimates of one year and lifetime prevalence rates of major depressive disorder of 4.1% (95%CI=2.4% to 6.2%) and 6.7% (95%CI=4.2% to 10.1%) respectively. Sex specific rates of major depressive

disorder for women were between 1.5 and 2.5 times higher than men. European rates were approximately three times higher than in the rest of the world.

The most comprehensive study of the international prevalence of depression was the World Health Organisation (WHO) World Mental Health Surveys, which used the WHO Composite International Diagnostic Interview (CIDI) in studies across 28 countries (The WHO World Mental Health Survey Consortium, 2004). This found one year prevalence rates of mood disorders which varied from 0.8% (95%CI=0.5% to 1.0%) in Nigeria and 1.7% (95%CI=0.6% to 2.9%) in Shanghai to 9.1% (95%CI=7.3% to 10.9%) in Ukraine and 9.6% (95%CI=8.8% to 10.4%) in the United States (US), for example. However, performance of the CIDI may be poorer in non-Western countries because the concepts and phrases used to describe depression are less consonant with cultural concepts than in developed Western countries or because of the stigma associated with depression.

A study of the prevalence of depression in five European countries (Ayuso-Mateos et al., 2001) found an overall prevalence of 8.6% (95%CI=7.1% to 10.4%), with rates of 10.0% (95%CI=7.8% to 12.9%) for women and 6.6% (95%CI=4.9% to 8.8%) for men. The highest rates in this study were found in the urban sites in the UK and Ireland with Liverpool having the highest rate of 17.1% (95%CI=10.5% to 26.8%). Lower estimates were obtained in the European Study of the Epidemiology of Mental Disorders project (Alonso et al., 2004), possibly due to more rigorous case ascertainment. This study found one year and lifetime prevalence rates of major depressive disorder of 3.9% (95%CI=3.6% to 4.2%) and 12.8% (95%CI=12.2% to 13.4%) respectively.

The UK national psychiatric morbidity survey (Jenkins et al., 2003) found a one-week prevalence rate for a depressive episode of 2.5% (95%CI=2.1% to 2.9%) for women and 1.7% (95%CI=1.3% to 2.1%) for men. The respective figures for the one-week prevalence of mixed anxiety and depression were 9.9% (95%CI=8.9% to 10.9%) and 5.4% (95%CI=4.6% to 6.2%). Being separated or divorced, a lone parent, unemployed or living in an urban area all increased the risk of having a neurotic disorder.

### 1.2.2.3   Primary care prevalence

The majority of people with depression will receive treatment in primary care (Walters and Tylee, 2006). In the UK a General Practitioner (GP) in primary care is likely to be the first doctor that people with diagnosable depression will consult (Goldberg and

Goodyer, 2005). However, many people with depression do not receive treatment in primary care (Goldberg and Huxley, 1992) and there are high levels of unmet need around the world (Wang et al., 2007). Data from the UK national psychiatric morbidity survey revealed that only 40.2% of men and 50.8% of women with a depressive episode consulted their GP about it in the previous year, although those with more severe illnesses were more likely to seek treatment (Bebbington et al., 2000).

The WHO collaborative study of psychological problems in primary care (Ustun and Sartorius, 1995) found an overall prevalence of depression amongst primary care attendees of 10.4%. This varied from 4.0% in Shanghai to 29.5% in Santiago, whereas in Manchester it was 16.9%. A European study has also found significant differences between countries, with the UK having the highest rates of common mental disorders amongst attendees (King et al., 2008). The UK rates of depression in this study were very similar for men (12.7%) and women (13.2%).

### 1.2.3    Socioeconomic inequalities

People of low socioeconomic status are more at risk of depression than those of high socioeconomic status. In a meta-analysis of prevalence and incidence studies, Lorant et al (2003) found that the lowest socioeconomic group had increased odds of being depressed (OR=1.8, 95%CI=1.6 to 2.1) and of having a new episode of depression (OR=1.2, 95%CI=1.0 to 1.5) than the highest socioeconomic group. People living in low socioeconomic status neighbourhoods are more at risk of incident depression than those in wealthier neighbourhoods (Galea et al., 2007). UK studies have revealed an association between low standard of living and increased risk of common mental disorder (Lewis et al., 1998; Weich and Lewis, 1998a). Further, in a Hampshire study the social deprivation score of the locality of GP practices explained almost half of the inter-practice variation in the prevalence of depression (Ostler et al., 2001).

### 1.2.4    Course of depression

### 1.2.4.1   Community samples

Many episodes of depression in the community resolve spontaneously without treatment (Goldberg and Goodyer, 2005). Estimates of the mean duration of episodes of major depression in epidemiological samples range from 13 to 27 weeks, with a median of about 12 weeks (Ustun and Kessler, 2002). Spijker et al (2002) found that

about one-fifth of people with major depression were still depressed after two years. Similarly, minor depression can be chronic and recurring for many people. Although between 46% and 71% recover within one to six years, between 16% and 62% still have minor depression after five months to one year after onset (Hermens et al., 2004).

Clinical factors such as initial severity of symptoms (Pevalin and Goldberg, 2003) and longer duration of previous episodes (Spijker et al., 2001) appear to be risk factors for chronicity of depressive symptoms. However, negative life events during follow-up (Spijker et al., 2001), negative childhood experiences (Brown et al., 1994) and lower socioeconomic status (Keller, 1994) have also been found to predict poorer outcomes, for example.

### 1.2.4.2   Primary care samples

Studies of severe depression in primary care report varying recovery rates. A recent review (Gilchrist and Gunn, 2007) found rates which varied from 35% in nine months (De Almeida Fleck et al., 2005) to 65% in six months (Limosin et al., 2004) or 67% in twelve months (Barkow et al., 2003). Relapse after a period of recovery is quite common with rates estimated at between 11% (Limosin et al., 2004) and 30% (Oldehinkel et al., 2000). The likelihood of relapse is predicted by the number of previous episodes of depression (Conradi et al., 2008). Recognition of depression by the GP appears to improve recovery rates, particularly in the short term (within three months) (Ormel et al., 1990; Ostler et al., 2001; Simon et al., 1999).

### 1.2.4.3   Socioeconomic inequalities

In a meta-analysis of persistence studies, Lorant et al (2003) found that the lowest socioeconomic group had higher odds of remaining depressed than the highest socioeconomic group (odds ratio = 2.1, 95%CI=1.4 to 3.1). In a UK study, attending a GP practice in a socially deprived location was associated with persistence of depression at both six weeks and six months (Ostler et al., 2001). To better understand these inequalities we first need to consider the theoretical perspectives on socioeconomic position, to which the notion of social capital makes an important contribution.

## 1.3 Theoretical perspectives on socioeconomic position

### 1.3.1 Introduction

The empirical literature exploring socioeconomic inequalities in depression is informed by a range of theoretical frameworks of socioeconomic position which are not always made explicit. The term 'socioeconomic position' refers to the social and economic factors that influence the location of individuals or groups within social structures that may affect health (Lynch and Kaplan, 2000). The term encompasses both 'social class' and 'socioeconomic status', which have been variously used to explore socioeconomic inequalities in depression.

### 1.3.2 Social class

The Marxian sociological tradition views society as stratified into classes which are determined by the nature of exploitative production relations. Marx (1867) saw the development of social classes as an inevitable component of capitalism. Capitalism is a commodity production process which not only meets the needs of people engaged within it, but involves the production of a surplus which can be exchanged in a market. Classes emerge from the social relations of production when surplus commodities are appropriated by a small number of people. These property owners ('bourgeoisie') are in a position to exploit those who rely on their labour for their livelihood ('proletariat').

Wright (1997) argued that exploitation in contemporary capitalism is quite complex with a middle class simultaneously exploiting and being exploited. He argued that exploitation occurs when the material welfare of one group causally depends on the material deprivation of another; when the deprived group are excluded from access to productive resources; and when the results of the labour of the deprived group is appropriated by the dominant group with detrimental effects on the health and welfare of the former (Wright, 1997).

Social class is consistently used by epidemiologists as a predictor of psychiatric morbidity, though rarely within a Marxist understanding of the concept (Lynch and Kaplan, 2000). For example, UK empirical studies of socioeconomic position and depression have traditionally used the Registrar General's social class grouping of society into five strata of similar levels of occupational skill. This owes more to eugenics and the tradition of British empirical social science than Marx (Szreter, 1984).

However, the neo-material interpretation of socioeconomic inequalities in health can be traced to Marxist notions of capital (see section 1.8.2).

### 1.3.3    Socioeconomic status

To a large extent our contemporary understanding of the concept of 'socioeconomic status' can be traced to Max Weber's seminal work *Economy and Society* (Weber, 1920). Weber argued that life chances were an important feature of class situation. Classes were groups of people in a similar situation so that their life chances were determined more or less in common. For example, the ownership of property is one distinguishing feature and Weber (1920) argued that those with property were considerably more powerful than those without. Although there is a potential for a pluralism of classes, he identified four major groups: the working class as a whole; the petty bourgeoisie; the propertyless intelligentsia and technical specialists; and those privileged through property or education.

Class situation is determined by the market. For example, the working classes are at a competitive disadvantage because of lower skills and access to fewer resources (Weber, 1920). Class situation is purely economic and does not imply associative or social relations (Gane, 2005). Weber did not concur with Marx that class consciousness was inevitable. However, Weber identified 'status groups' which comprised communal social relationships that provided a "social estimation of honour" (Weber, 1920). Status groups were closed social structures which embodied power, though did not necessarily have to be contingent upon economic advantage. Weber argued that sources of power could be situated elsewhere from wealth, hence the development of our contemporary concept of socioeconomic status which is complex and multi-faceted. In health research socioeconomic status is frequently equated with income (Braveman et al., 2005), though a variety of other indicators such as education, wealth, occupation or housing tenure, for example, are used either singly or together (Lynch and Kaplan, 2000).

### 1.3.4    Social capital

As a neo-capital theory (Lin, 2001), social capital is integral to an individual's socioeconomic status. Complimenting the contribution of economic or material capital (Marx, 1867) and human capital (Becker, 1964), the concept of social capital can enrich the contextual measurement of socioeconomic status (Oakes and Rossi, 2003).

However, independent of other components of socioeconomic status, it may be important for recovery from depression in its own right. Before we investigate potential causal pathways, we will review the concept in a little more detail.

## 1.4   The neo-capital theory of social capital

### 1.4.1   Introduction

Neo-capital theories demonstrate an evolution in thinking about capital, though their origins pre-date Marx. The origins of the notion of human capital, that idea that capital can rest with the individual labourer can be traced to Adam Smith (1776). Our contemporary understanding of human capital has a number of protagonists including Johnson (1960), who argued that labourers have become capitalists through the acquisition of knowledge and skills that have economic value. With their knowledge and skill they can demand payment for their labour that is beyond its exchange value. Subsequently, education has been viewed as the key to the acquisition of human capital.

The neo-capital theory of social capital was developed by sociologists largely working independently of each other. However, it has been sufficiently refined and operationalised into a robust empirical theory (Lin, 2001; Lin et al., 2001) to allow us to discuss it as a coherent corpus of work. The 'founding fathers' were Pierre Bourdieu and James Coleman, although the latter was also influential in the development of communitarian notions of the concept.

### 1.4.2   Pierre Bourdieu

The contemporary origins of social capital can be traced to the French sociologist Pierre Bourdieu (Bourdieu, 1979, 1980, 1986). His influence on the development of the concept of social capital is often understated, probably because his work was steeped in heavy abstraction, a characteristic of French social theory, undoubtedly a deterrent to more empirically-minded British and American intellectuals (Fine, 2001).

Bourdieu's early use of the concept appeared to be a metaphor for power or social advantage (Schuller et al., 2000). He used it to describe the principle of 'social effects', which refers to when individuals of similar socioeconomic status perform very differently because of their differential ability to mobilise their social networks either by

direct intervention or by the symbolic effect of simply belonging to them. These social connections – both institutional and personal – become increasingly effective as the social position of these contacts increase (Fassin, 2003). Bourdieu later defined social capital as:

> "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalised relationships of mutual acquaintance or recognition" (Bourdieu, 1986: 248).

Bourdieu's treatment of the concept drew upon both Weber and Marx. Firstly, his understanding of 'the social' was disarmingly similar to Weber's (1920) notion, who considered it as:

> "a process of socialization that involves reciprocal and meaningful exchanges between groups and individuals" (Gane, 2005: 221).

Bourdieu viewed social relationships as crucial as they allowed individuals to claim access to resources possessed by their associates.

Secondly, Bourdieu's use of 'capital' was rather metaphorical and referred to the capacity to exercise control over one's own future and that of others. Social capital played a supporting role to economic and cultural capital, acting as a multiplier for them, while at the same time being created and maintained by the conversion of economic and cultural capital in the unending process of sociability (Bourdieu, 1986). For example, through social capital individuals can gain access to economic capital (e.g. cheap loans), and they can increase their cultural capital through contacts with experts (e.g. academics) or by affiliating to institutions which confer valued credentials (e.g. political parties).

Bourdieu claimed that his notion of capital originated from pre-capitalist societies in which he used symbolic capital to explain honour (Fine, 2001) and that he was not a Marxist. However, Bourdieu clearly saw the forms of capital as residing in the hands of the dominant class who controlled the means of production. Also, implicit in his theory was the notion that individuals invested in their social relationships in order to maintain their social position.

Bourdieu's conception of social capital is perhaps best viewed in the tradition of neo-capital theories (Lin, 2001). It is not a classic capital theory as it adopts a micro level of analysis focused on the individual in contrast to an examination of the effects of macro level or structural influences. Also, action or choice is an important element in social capital theory, whereas in classic capital theory action is reserved solely for the capitalists.

### 1.4.3    James Coleman

Coleman developed his ideas about social capital through empirical work of the relationship between educational achievement and social inequality. For him:

> "social capital constitutes a particular kind of resource available to an actor" (Coleman, 1988: S98).

Conceptualised and refined within an educational framework, and influenced by Loury (1987):

> "social capital is the set of resources that inhere in family relations and in community social organisation and that are useful for the cognitive or social development of a child or young person" (Coleman, 1990: 300).

Coleman located the concept within a neo-functionalist framework. Functionalists emphasise the importance of social institutions such as families or communities in meeting individual needs and maintaining social stability. In a post hoc analysis of previous work investigating the higher attainment of pupils in Catholic schools (Hoffer et al., 1985), he suggested that social capital within Catholic families was influential in raising the educational attainment of their children, particularly those of lower socioeconomic status (Coleman, 1990). Coleman's focus on the family and immediate neighbourhood overemphasises close ties, to the neglect of weaker ties which might prove more effective in providing access to new knowledge and resources (Granovetter, 1973).

He argued that social relations constituted useful capital resources for individuals through processes such as establishing obligations, expectations and trustworthiness, creating channels for information and setting norms backed by efficient sanctions. For example:

"if A does something for B and trusts B to reciprocate in the future, this establishes an expectation in A and an obligation on the part of B to keep the trust. This obligation can be conceived of as a 'credit slip' held by A to be redeemed by some performance by B. If A holds a large number of these credit slips from a number of persons with whom he has relations, then the analogy to financial capital is direct: The credit slips constitute a large body of credit on which A can draw if necessary" (Coleman, 1990: 306).

Coleman suggested that social structures characterised by trust were integral to the development of social capital, whereas areas marked by a high degree of social disorganisation were not. These ideas were influential for Putnam's (1993) communitarian notion of social capital. However, Coleman's use of rational choice theory, which also formed the basis of his earlier work on social exchange theory (Coleman, 1972), denoted an important theoretical development for the neo-capital theory of social capital.

Rational choice theory assumes that complex social phenomena can be explained in terms of the basic individual actions of which they are composed, an approach otherwise known as methodological individualism (Scott, 2000). It applies the same principles that are used in economics to understand the supply of goods and services through a market, to understand interactions in which such resources as time, information, approval and prestige are involved. As Scott (2000) argues:

"In rational choice theories, individuals are seen as motivated by the wants or goals that express their 'preferences' … As it is not possible for individuals to achieve all of the various things that they want, they must also make choices in relation to both their goals and the means for attaining these goals … Rational individuals choose the alternative that is likely to give them the greatest satisfaction" (Scott, 2000: 127-128).

Coleman's theory has a number of empirical limitations. He states that:

"Social capital is defined by its function" (Coleman, 1990: 302).

For Coleman, social capital is identified when and if it works, which neglects to account for potential negative outcomes of the phenomena (Portes, 1998). This may also implicate a tautology; that the potential cause of social capital can only be determined

by its effect. Causes and effects need to be separated to make the theory empirically viable, a process which Lin (2001) undertakes thoroughly.

### 1.4.4    Nan Lin

Nan Lin's social capital theory (Lin, 2001) is an extension of his social resources theory (Lin, 1982), in which he proposed that access to and use of social resources (resources embedded in social networks) can lead to better socioeconomic status. He further defined resources as characterised by wealth, power and status:

> "Like personal resources, social resources may include material goods such as land, houses, car, and money and symbolic goods such as education, memberships in clubs, honorific degrees, nobility or organizational titles, family name, reputation, or fame" (Lin, 2001: 43).

His definition of social capital was:

> "investment in social relations by individuals through which they gain access to embedded resources to enhance expected returns of instrumental or expressive actions" (Lin, 1999a: 39).

This clearly identified three elements to the process which can be modelled empirically: investment in social relationships; access to and mobilization of social capital; and potential returns of social capital. The process assumes that actions are taken rationally in order to maintain or gain resources for survival.

Lin suggested two different motives for accessing social capital which characterised the outcomes that may occur. The first motive is to maintain existing resources held by the individual, which promotes 'expressive action'. Lin argued that this requires recognition by other people of the individual's ownership of these resources or sharing the individual's sentiments about them. Examples include a mother talking to another mother about her affection for her child or a man complaining to his partner about his boss. Sympathy or empathy is gained from the other person, thereby recognising, legitimising and sharing the individual's claims to their resources (Lin, 2001).

The second motive promotes 'instrumental actions' to acquire valued resources not possessed by the individual. Actions are taken by other people to help the individual to

achieve a goal or to increase resources. Examples might be seeking a job or promotion, finding a babysitter or getting a loan. Lin (2001) argued that losing resources poses a much greater threat to individuals than gaining additional ones, making expressive actions more important than instrumental actions.

The principle of reciprocity, embedded in the social foundations of both modern and traditional societies (Lévi-Strauss, 1969), is at the core of this definition of social capital. In its most primitive form, it refers to a non profit-making mutual exchange. The exchange of Christmas cards in Western societies, for example, is a social transaction that reinforces social bonds and prestige with a neutral cost-benefit ratio. Exchange theory (Blau, 1964) develops this principle and suggests that individuals often derive specific benefits from social relations because their associates purposively provide these benefits for them. If an individual is grateful for a favour received from a friend, for example, he or she is likely to find the opportunity to return the favour. In turn, the friend is likely to reciprocate and the mutual exchange of favours strengthens the social bond. Blau (1964) adds that beneath this apparent altruism lies an expectation that helping others will bring social approval, which is of great importance to us.

Lin's neo-capital theory of social capital is consistent with a number of renditions which followed Bourdieu and Coleman (e.g. Burt, 1992; Erickson, 1996; Flap, 1999, 2002; Portes, 1998). For example, Flap's research programme has distinct resonances in Lin's work (Flap, 1999, 2002). He defined social capital as:

> "Social capital basically refers to the importance of resources which, although possessed by other persons, are available to a given individual through his social relations to these others … The resources of affiliated individuals are substitutes for someone's own resources. Basic constituents of social capital are the number of persons in an individual's network, their resources, and the extent to which they are prepared or obliged to help him when called upon to do so" (Flap, 1999: 10).

Similarly, though without reference to Lin, Hean and colleagues (2003) developed a dynamic model of the accumulation of social capital based on Marx's classic theory of capital. Their R-C-R' model assimilated Marx's (1867) M-C-M' cycle of economic capital accumulation. In line with Marx's investment of money (M) into a commodity (C) to gain a return of increased money (M'), their model required the investment of a resource (R) into a commodity (C) to increase the value of the invested resource (R').

They used the example of the investment of trust in a group (R), the receiving and providing of favours (C) and the subsequent increase of trust in the group (R'). An individual joining a group (either formal or informal) may initially be a little wary of the motives or desires of other group members. In order to fully benefit from group membership, the individual needs to develop trust in the other group members and demonstrate that he or she could be equally trusted. A mutual exchange of interests or favours (C) – which initially requires an investment of trust in group members (R) – helps to consolidate that individual's position within the group. A by-product of the exchange is an increase in trust in the group (R'). This example provides a useful theoretical exposition of the 'capital' element of the concept, but may be limited to formal group membership and does not adequately capture the full extent of social complexity.

### 1.4.5    Social networks, social support and social capital

The neo-capital conception of social capital is perceived as not being original due to its association with social networks and social support (McKenzie, 2004; McKenzie et al., 2002a; Whitley and McKenzie, 2005), which have already been extensively investigated in mental health research (Kawachi and Berkman, 2001). For example, McKenzie and Harpham (2006a) argued that this conception of social capital acts as a:

> "proxy variable for access to the active ingredient – social support and social networks" (McKenzie and Harpham, 2006a: 13).

We argue that the sociological concepts of social capital, social support and social networks are distinct (Webber and Huxley, 2004) and our arguments are not isolated examples of support for this paradigm in mental health research (e.g. Pevalin, 2003).

### 1.4.5.1   Social networks

Social networks have been described as a perspective, not a theory (Mitchell, 1974), from which specific theories such as social support and social capital are derived. Mitchell (1969) defined a social network as:

> "a specific set of linkages among a defined set of persons, with the additional property that the characteristics of these linkages as a whole may be used to interpret the social behavior of the persons involved" (Mitchell, 1969).

Specific evidence about the effect of features of social networks, such as size, density and frequency of contact, on mental health, is not consistent (Lin and Peek, 1999).

### 1.4.5.2   Social support

Social support is the assistance gained from social networks. Sociologists tend to focus on the function of social support for the individual (e.g. Weiss, 1974) or the structures in which the transactions occur (e.g. Wellman and Wortley, 1990). Lin and Westcott's (1991) definition reflects both these perspectives, in which social support is:

> "the process (e.g. perception or reception) by which resources in the social networks are brought to bear to meet the functional needs (e.g., instrumental and expressive) in routine and crisis situations" (Lin and Westcott, 1991: 215-6).

Others emphasise the cognitive and behavioural aspects of the concept and argue that social support is characterised by perceptions rather than the resources that are provided. For example, Cobb (1976) argued that social support is information leading the individual to believe that he or she is cared for and loved, esteemed and valued, and belongs to a network of communication and mutual obligation. Many definitions feature both functional and cognitive aspects (e.g. Barrera, 1986; Vaux, 1988).

The perception of social support appears to have a stronger association with mental health than actual receipt of social support, and has consequently been studied more frequently (e.g. Cohen and Syme, 1985; Cohen and Wills, 1985; Dean and Lin, 1977; Gottlieb, 1981; Henderson, 1981; Kessler et al., 1994; Lin and Peek, 1999; Wethington and Kessler, 1986). The effect of perceived support on well-being is not mediated by received support (Kaul and Lakey, 2003). In fact, received support appears to be either unrelated or negatively associated with depression (Reinhardt et al., 2006). A low correlation between received and perceived support found in a recent meta-analytic review (Haber et al., 2007) confirms that social cognitions and actual support received need to be separately conceived and measured.

Women appear to benefit more in health terms from perceived social support than men (Fuhrer and Stansfeld, 2002; Schwarzer and Leppin, 1989). They are more likely to have a confidante, and larger and more varied social networks, than men (Antonucci, 1994). Particularly for men, having a smaller number of intimate social contacts predicts worsening mental health (Brugha et al., 2005). Also, women provide and

receive more support (Kessler et al., 1985). However, although they can more readily mobilise support when in need, their social connections may make women with low resources more vulnerable to mental health problems, especially if such connections oblige them to provide social support to others (Belle, 1987). For example, a study of care-givers found that those who felt most let-down by people in their social networks had the highest risk of depression (Pagel et al., 1987).

### 1.4.5.3   Social capital

Social capital refers to the resources that inhere within an individuals' network and therefore is concerned with both the structure and resourcefulness of the network:

> "While both social capital and social support focus on network members, social capital reflects network members' structural positions, and social support refers to network members' emotional, instrumental, or informational assistance" (Song and Lin, in press: 8).

Research on social networks, social support and mental health has largely been conducted outside the theoretical paradigm of social capital. It would be inaccurate to superimpose the neo-capital theory of social capital on this large body of research without careful attention to the theoretical context of each study. Although the neo-capital paradigm draws upon other sociological and economic concepts, it has a distinct heritage and meaning from the concepts of social networks and social support (Webber, 2005). It is important to make careful distinctions between these to avoid over-simplistic comparisons, particularly as the neo-capital concept of social capital is largely untested in mental health research.

Some argue that the neo-capital theory of social capital cannot be described as a social theory because of its methodological individualism (e.g. Fine, 2001). However, our conceptual review suggests that it is far more than a metaphor and that it may have the potential to provide some dynamic insights into the course of depression, in contrast to the communitarian theory of social capital, which is beset with theoretical and methodological problems.

## 1.5   The communitarian theory of social capital

### 1.5.1   Introduction

The sociological origins of the neo-capital theory of social capital can be traced back many years and the communitarian theory of social capital also has a long heritage. It is frequently traced to Alexis de Tocqueville's *Democracy in America* in which he famously wrote:

> "Americans of all ages, all conditions, and all dispositions constantly form associations" (de Tocqueville, 1840 / 1945: 106).

Social capital was used figuratively by Hanifan (1920) as a means of describing community well-being, a notion echoed by Jacobs (1961). However, its modern renaissance came in the work of Putnam (1993) and emerged in the public health literature a few years later (Kawachi et al., 1997). It tends to emphasise social capital as a collective or contextual attribute, but analysis is also conducted at the level of individuals. Academic thought within this tradition has been referred to as the 'social cohesion' school of social capital (Kawachi, 2006) or 'communitarian' approaches to the concept (Moore et al., 2005b). It is a neo-Durkheimian research programme as it resonates his seminal work on social integration and suicide (Durkheim, 1951) and has been invoked in the debate over health inequalities.

### 1.5.2   Health inequalities

In his extensive literature on health inequalities Richard Wilkinson argued that the social environment, rather than material deprivation, is responsible for health inequalities (Wilkinson, 1996, 2005). For example:

> "The fact that health seems to be influenced more by differences in income than by average level of income suggests that cognitive processes of social comparison are involved. The importance of relative income to health suggests that psychosocial factors related to deprivation and disadvantage are involved. That is to say, it is less a matter of the immediate physical effects of inferior material conditions than of the social meanings attached to those conditions and how people feel about their circumstances and about themselves" (Wilkinson, 1994: 70).

Wilkinson (1999) used the concept of 'social cohesion' to describe social environments which were conducive to good health. Indicators of social cohesion he referred to were trust (Kawachi et al., 1997), homicide rates (Kaplan et al., 1996), hostility (Williams et al., 1995) and people's involvement in local community life (Putnam, 1993), all of which were strongly correlated with income inequality (Wilkinson, 1999). He argued against a simplistic pathway to good health by simply getting on better with your neighbours. Instead, he suggested that social cohesion could be a "societal epiphenomenon" (Wilkinson, 1999: 534) which reflects the underlying processes that affect health. It both reflects individuals' underlying social confidence and provides a social environment which increases their sense of confidence and trust in others.

Wilkinson found that the emerging concept of social capital could also potentially explain how social environments may affect health. Drawing upon Coleman (1990) and Putnam (1993) he saw social capital as:

> "…those features of social organisation, such as networks, norms of reciprocity, and trust in others, that facilitate cooperation between citizens for mutual benefit" (Wilkinson et al., 1998: 581).

Using data from the US General Social Surveys, Wilkinson and colleagues (1998) found strong correlations between social trust (a proxy indicator of social capital), homicide rates, income inequality and mortality rates. They argued that social environments with wide income disparities generated invidious social comparisons which fostered violent behaviour from those alienated or perceived to be disrespected. Although there is some evidence of the physiological effects of low social status, it remains difficult to distinguish between the individual and psychosocial impact of inequality on health (Brunner, 1997).

However, the model connecting health inequalities, social cohesion and health ignores class relations, a factor that might help explain how income inequalities are generated and account for both relative and absolute deprivation (Muntaner and Lynch, 1999). Lynch and colleagues (Lynch et al., 2001; Lynch et al., 2000) argued that the interpretation of links between income inequality and health must begin with the structural causes of inequalities, and not just focus on perceptions of that inequality. Further, the importance of neo-liberalism in producing *both* higher income inequality and lower social cohesion is often ignored (Coburn, 2000).

Mental health researchers have coalesced around this school of thought, as in public health (Moore et al., 2005b). Recent reviews have highlighted the almost uncritical acceptance of Putnam's thesis and its translation into mental health research, albeit with some tacit acknowledgement of its conceptual limitations (Almedom and Glandon, 2007; De Silva et al., 2005; McKenzie and Harpham, 2006b; Whitley and McKenzie, 2005). We suggest that a more critical examination of Putnam's ideas is warranted.

### 1.5.3 Robert Putnam

Putnam's seminal study on social capital was on regional government in Italy (Putnam, 1993). In this he argued that civic traditions in the north of Italy promoted the growth of voluntary organisations, norms and trust which made possible good governance, legitimate democratic government, as well as economic growth, in contrast to the south of the country.

Transferring his attention to his native United States, Putnam investigated the perceived decline in civic engagement. In an evocative paper entitled 'Bowling Alone' (Putnam, 1995), he used the example of the decline in the number of bowling clubs. He argued that these served not just as recreational channels but as sustainers of the wider social fabric. Together with analyses of attitudes and behaviour, he identified a general secular decline in levels of social capital and put the blame on television for distracting people from opportunities for social engagement.

Putnam subsequently conceptualised social capital as:

> "features of social life – networks, norms, and trust – that enable participants to act together more effectively to pursue shared objectives" (Putnam, 1996: 34).

Social capital became characterised as the 'glue' which holds societies together by collective efficacy, social trust, reciprocity, participation in voluntary organisations and social integration for mutual benefit (Lochner et al., 1999). Putnam's definition viewed social capital as a contextual property of communities, groups or areas rather than an individual trait. Its benefits are hypothesised to affect everyone equally within that community, regardless of differences in individual behaviour or values.

### 1.5.4    Dimensions of communitarian social capital

Within the communitarian conception, three different dimensions have been identified: structural/cognitive; bonding/bridging; and horizontal/vertical (McKenzie and Harpham, 2006a).

### 1.5.4.1    Structural and cognitive social capital

Structural social capital relates to the relationships, networks or associations that link groups and individuals. The most frequently used measure of structural social capital is voluntary group membership, closely following Putnam's ideas. For example, in Italy he found a strong correlation between the number of choral societies and the efficiency of the local health management system (Putnam, 1993). The cognitive component of social capital relates to Putnam's ideas about altruism and civic responsibility (Putnam, 1996, 2000). It is commonly measured in surveys by aggregating responses to questions about trust, reciprocity and perceptions of civic engagement and seems to have a complex relationship with structural social capital. The precise relationship between cognitive and structural social capital is not known. However, it seems that both forms of social capital can erode fast and be destroyed fairly quickly, compared to the building up of such capital, which takes time (Uphoff, 2000).

### 1.5.4.2    Bonding and bridging social capital

Bonding and bridging forms of social capital relate to the nature of ties between people or groups. Bonding social capital relies on strong ties between people. It is inward-focused and characterised by homogeneity, loyalty and exclusivity. Its parallel in neo-capital theory is group or network closure which Bourdieu (1986) viewed as essential to maintaining resources within elite groups. Bridging social capital, in contrast, links diverse groups and people. It is characterised by weak ties and has an outward focus. Social network research has identified the importance of bridges within and between networks and the strength of weak ties (Burt, 1992; Granovetter, 1973).

### 1.5.4.3    Horizontal and vertical social capital

Vertical social capital is often distinguished from horizontal social capital by virtue of the connections being made within a hierarchical structure to government and other institutions, rather than within and between communities. Lynch (2000) suggested that

the 'social connectedness' of disadvantaged groups to institutional, legal, political and economic structures may be important in explaining health inequalities. For example, some relatively deprived inner London council estates with high rates of mental health problems have high horizontal and low vertical social capital (Cornwell, 1984; Whitley, 2003). Vertical social capital is considered potentially important for economic development (Szreter, 1999; Woolcock, 1998), though remains relatively untested in mental health research.

### 1.5.5    Conceptual limitations

The communitarian concept of social capital has often been used without careful consideration of its meaning or definition. Fine (2001) argued that Putnam's (1993) conception was imprecisely defined, it ignored the reproduction and exercise of power as initially conceived by Bourdieu (1986), and was built upon shaky empirical foundations. He disputed the casual bringing together of the complex notions of 'social' and 'capital', arguing that the concept is essentially meaningless. Further, studies of contemporary communities challenge Putnam's (1993) notion of community as embodied in his view of social capital. For example, a study of social capital in Luton concluded that:

> "Putnam's essentialist conceptualisation of a cohesive civic community bore a greater resemblance to people's romanticised reconstructions of an idealised past than to people's accounts of the complex, fragmented and rapidly changing face of contemporary community life – characterised by relatively high levels of mobility, instability and plurality" (Campbell et al., 1999: 156).

Friedman et al.'s (2007) study in Brooklyn, New York, reached similar conclusions. This highlighted how the predominant conceptualisation of social capital ignores the importance of social networks in areas low in trust. They concluded that social network processes in socioeconomically deprived communities assist residents to develop the belief systems, activities and organisation necessary to pursue their goals.

Communitarian social capital is often accepted uncritically as a public good, but it can be a mixed blessing (Portes and Landolt, 1996). It is perhaps ironic that Timothy McVeigh, convicted of the Oklahoma bombing in 1995, was a member of a bowling league with his co-conspirators (Levi, 1996). Also, homogeneous communities with

strong ties and members obedient to social norms can be asphyxiating places to live in and exclusionary to outsiders (Baum, 1999).

## 1.5.6 Empirical challenges

A variety of measurement strategies have been employed to measure social capital at the individual and group level within this paradigm. A review of 28 studies found that numerous different indicators were used to measure eleven different aspects of social capital (De Silva, 2006). In particular, achieving a true ecological measure of social capital has bedevilled mental health researchers working within this paradigm (Henderson and Whiteford, 2003; McKenzie et al., 2002). Some studies have used proxy measures such as voting records (Rosenheck et al., 2001) or public spaces per capita (Veenstra, 2005). Unless used with other measures of social capital, proxy measures ignore the complexities of the concept (Portes, 1998) and give, at best, a superficial view of it (Muntaner et al., 1999). An alternative approach has been to aggregate individual survey responses to a community level to measure collective social capital, which is susceptible to the atomistic fallacy (Diez Roux, 1998).

The use of cross-sectional survey data to measure social capital has been criticised as being methodologically and theoretically flawed (Forbes and Wainwright, 2001). On the one hand, survey data tends to under-represent rural, working class or marginalized communities (Graham, 1995). On the other hand, survey measures of structural social capital which ask about formal group membership frequently do not take into account informal groups or networks, important sources of social capital for many people (Schudson, 1996). Putnam (2000) excluded groups formed after 1967 such as those around civil rights, the environment and consumerism (Jackman and Miller, 1998). Formal group membership may introduce a class bias into the measurement of the concept as people are more likely to report membership of a golf club than a street gang, for example (Forbes and Wainwright, 2001).

Finally, the use of multi-level statistical models in a number of communitarian social capital studies has been criticised for not accounting for 'selection effects' (Oakes, 2004). Studies have found that, after controlling for individual socioeconomic status, the socioeconomic status of neighbourhoods has a statistical association with mental health, indicating the deleterious effect of deprived neighbourhoods on all their residents (Drukker et al., 2007). However, an individual's socioeconomic status, known to be associated with mental health, obscures the effect of a neighbourhood on their

mental health as they are not there by chance alone. For example, people with severe and enduring mental health problems are more likely to live in deprived communities because of the greater availability of affordable or social housing. Randomising people to live in different neighbourhoods in order to evaluate their effect on mental health would not be ethical and other approaches to accounting for selection effects are required.

## 1.6    Social influences on depression

### 1.6.1    Introduction

Two hypotheses have been tested extensively to investigate the causal direction of the association between individual socioeconomic position and depression. Firstly, depression leads to downward mobility or restricts upward mobility (the social selection-drift hypothesis). Secondly, people of low socioeconomic position suffer more stress and adversity than higher status individuals which leads to depression (the social causation hypothesis).

### 1.6.2    Social selection-drift hypothesis

Jarvis (1855) was one of the first to suggest that poverty was the result of mental disorder. With the advancement of research in genetics, others broadened the hypothesis to encompass social selection: that people of lower socioeconomic position had a greater predisposition to mental disorder (e.g. Häfner, 1988; Ødegaard, 1956). Researchers have analysed and re-analysed data sets to test this hypothesis. For example, a re-analysis of data from four studies which lent support to the social selection-drift hypothesis (Birtchnell, 1971; Goldberg and Morrison, 1963; Langner and Michael, 1963; Turner and Wagenfeld, 1967) found that intergenerational social mobility differences between people with severe mental health problems and the general population were negligible (Fox, 1990). However, a further re-analysis found flaws in Fox's (1990) methodology which led to an underestimation of downward socioeconomic drift (Rodgers and Mann, 1993).

Support for the social selection-drift hypothesis appears strongest for severe mental health problems such as psychosis rather than common mental disorders such as depression or anxiety (Murali and Oyebode, 2004). In the case of the latter, the social causation hypothesis has been more influential and most longitudinal analyses have

suggested a causal direction from socioeconomic position to depression (Muntaner et al., 2004).

### 1.6.3   Social causation hypothesis

Early community epidemiological studies (Faris and Dunham, 1939; Hollingshead and Redlich, 1958; Srole et al., 1963) provided evidence in support of the social causation hypothesis. More recent, and arguably more rigorous, tests of the social causation and social selection hypotheses for depression also favour causation above selection (Dohrenwend et al., 1992; Johnson et al., 1999; Moos et al., 1998b; Power et al., 2002; Ritsher et al., 2001). It appears that both influences from earlier in the life course such as multiple adversities in childhood (Power et al., 2002), low parental education (Ritsher et al., 2001) and low parental socioeconomic status (Johnson et al., 1999), and contemporaneous factors such as macro-economic changes (Fenwick and Tausig, 1994), occupational direction, control and planning (Link et al., 1993), unemployment (Brenner, 1973; Hamilton et al., 1990; Warr and Jackson, 1985) and life events (Brown and Harris, 1978), for example, are associated with higher prevalence of depression in people of lower socioeconomic position.

Researchers both influence, and are influenced by, the zeitgeist and this is reflected in their empirical work. For example, greater support has been provided for the social selection hypothesis in the US in recent years (Jarvis, 2007) possibly as a flight from politically unsafe discourses about the effects of poverty or racial discrimination. Similarly, attention has shifted away from the social causes of depression to a focus on genetics in UK research (Goldberg and Goodyer, 2005). However, there is considerable evidence that social factors predict the course of depression and earlier studies indicated that reduction of social difficulties was associated with the largest improvement in depression (Ronalds et al., 1997).

Studies indicate that those with the most vulnerabilities and the severest episodes of depression will recover more slowly (Goldberg and Huxley, 1992).  Social factors such as poverty and unemployment (Weich and Lewis, 1998b), interpersonal difficulties (Goering et al., 1992), unsatisfactory housing conditions (Goldberg et al., 1990), the absence of positive events (Brown and Moran, 1994) and providing care (Buck, 2000) have all been related to lower rates of recovery.  On the other hand, positive social support (Brugha et al., 1997), crisis support (Brown et al., 1986), 'fresh start' life events

(Brown et al., 1988) and positive life changes (Neeleman et al., 2003) appear to help people recover from depression.

## 1.7   Social capital and depression

### 1.7.1   Introduction

In general, social ties appear to be important for good mental health (Kawachi and Berkman, 2001). The investigation of the effect of social networks and social support on depression has a long history (Mueller, 1980). In spite of considerable research on the effect of social support on depression, the mechanisms of the association remain unclear (Paykel, 1994). Berkman and Glass (2000) suggest there are at least three mechanisms through which social networks can have an influence: the well-being effects of social support (stress-buffering model); the influence on behaviours (main effect model); and the provision of resources and advantages (social capital model).

### 1.7.2   Stress-buffering model

The stress-buffering model suggests that social support acts as a buffer against psychological distress caused by stressful life events (Cohen and Wills, 1985). There is some evidence to support this. For example, crisis support following a life event is protective against the onset of depression (Broadhead et al., 2001; Brown and Harris, 1978). The corollary also appears to be the case, that is the absence of support, or being 'let down' in a crisis, increases the risk of depression (Brown et al., 1986). Strong ties within networks have been found to decrease the effect of undesirable life events on depression (Lin et al., 1985). They also increased perceived social support, which then decreased depression (Ensel and Lin, 1991). Dalgard and colleagues (1995) have produced similar findings. In a study of migrants from East Germany following the opening of the Berlin Wall, Schwarzer et al. (1994) found that social support appeared to buffer the harmful effects of unemployment on depression. However, some studies have found that while social support was associated with recovery from depression, it did not buffer the harmful effects of life stress (e.g. Brugha et al., 1997; Stansfeld et al., 1998). Other prospective studies have also found no support for the stress-buffering hypothesis (e.g. Burton et al., 2004; Ritter et al., 2000; Wade and Kendler, 2000a; Wildes et al., 2002).

### 1.7.3    Main effect model

The main effect model suggests that social support can directly affect psychological well-being, irrespective of exposure to stress. Positive social relationships can have a beneficial effect on mental health by producing a sense of purpose, belonging, security and recognition of self-worth (Choenarom et al., 2005; Cohen et al., 2000; Hagerty and Williams, 1999). Level of social support has been found to independently predict depressive symptoms in some prospective studies (e.g. Brugha et al., 1990a; Fondacaro and Moos, 1987; Lara et al., 1997; Schroevers et al., 2003).

Although the evidence is equivocal about the mechanism involved, there appears to be a consensus that positive social support can protect people's mental health (Brown et al., 1986; Brugha et al., 1987; Caplan, 1974; Cassel, 1974; Turner and Marino, 1994) and assist recovery from depression (Brown et al., 1988; Leenstra et al., 1995; Pevalin and Goldberg, 2003). In fact a perceived lack of support increases the incidence of common mental disorders (Berkman and Glass, 2000; Boreham et al., 2003; Henderson, 1981; Wethington and Kessler, 1986). This is particularly true for women (Cooper et al., 1999).

### 1.7.4    Social capital model

Social capital theory argues that individuals can anticipate returns from their investment in social relationships through four mechanisms: information, influence, social credentials and reinforcement (Lin, 2001). These mechanisms may enhance health in general (Song, 2007; Song and Lin, in press), or positively affect the course of depression in particular.

Firstly, the provision of expert information from network members about the most effective interventions or health behaviours may affect the outcomes of depression. Normative guidance about health behaviours, such as physical activity, health care utilisation or treatment adherence may have a beneficial effect on the course of depression (Berkman and Glass, 2000; Strawbridge et al., 2001). However, peer influences about health behaviours may equally be harmful, as has been found in network studies of the injection practices of drug users (Lovell, 2002).

Information from network members does not have to be health specific to be of potential benefit to someone with depression. Network members can be influential in

providing employment opportunities and it has been estimated that more than a third of the workforce find employment through their own contacts (Flap, 1999). Additionally, social capital has a positive role in status attainment in the job market (Flap and Völker, 2001; Lin, 1999b; Lin et al., 1981). For individuals with depression, obtaining a higher status job, or just obtaining a job, can improve their financial position and quality of life. Additionally, it can enhance their recovery by increasing their self-esteem, confidence and independence.

Secondly, network members' resources may exert an influence that is additional to an individual's own personal resources. The power and authority of network members may exert a similar influence on health that individually possessed power and social ordering has on exposure and vulnerability to health risks (Song, 2007).

Thirdly, network members' resources may act as social credentials and could directly intervene in health and social care. For example, Abrums (2000) showed how the care and attitude from a hospital changed dramatically for a black women near death after her ex-husband, a doctor, advocated on her behalf.

Fourthly, network members' resources can reinforce an individual's identification with a group and help to maintain subjective social status (Song, 2007), which may help to maintain mental health. Social capital theory argues that individuals are motivated to protect themselves against possible losses of personal resources and they are likely to access network members' resources in order to help them do so (Lin, 2001). Network members share their resources because the preservation of another person's resources is necessary if they are likely to need them in the future. Accessing strong and homophilous ties in order to maintain resources – interactions between people with similar resources – can reinforce an individual's identification with a group, social class or people of a similar social status. Social capital can thus help to maintain subjective social status, which has been found to protect health independently of objective socioeconomic status (Song, 2007). This principle is perhaps more applicable to resource rich individuals whereas the material returns of social capital may be more beneficial for resource poor individuals.

Material resources of network members such as income and wealth provided as cheap loans or gifts to an individual with depression, whose own resources are depleted through unemployment or long-term sick leave, can help to alleviate debt or provide new opportunities. Longitudinal evidence suggests that not having the opportunity to

borrow money increases future risk of depression (Ostberg and Lennartsson, 2007). Additionally, it is conceivable that people with depression may benefit from the surplus of an investment in social relationships, or the returns of social capital, such as professional work undertaken at 'mates rates' or favours provided with no expectation of reciprocation, for example. The effect of resources and advantages gained from social networks on depression is under-researched (Berkman and Glass, 2000), although it has been found to be associated with increased life satisfaction (Acock and Hurlbert, 1993). However, a recent study has found that receiving money from network members prospectively reduced the likelihood of depression amongst former and current injection drug users by almost a quarter (Knowlton and Larkin, 2007).

In summary, there appears to be two elements of the neo-capital theory of social capital that may have a connection with depression. Firstly, 'resource-based social capital' refers to the effect of the resources such as information, expert advice, professional services or money accessed from other network members on the course of depression. It is possible that this may be more important for resource-deprived individuals than those with sufficient personal resources. Secondly, the social influence of network members, which may be greater for those higher in social hierarchies, may be termed 'prestige-based social capital'. As illustrated, this may provide better access to treatment or services for individuals less able to advocate for themselves.

Some evidence in support of the social capital model is emerging. In a cross-sectional survey in Taiwan prestige-based social capital was negatively associated with depression, independent of social support (Song and Lin, in press). The authors of this study also found that the effect of social capital on depression was greater for those with lower education. These findings were replicated in a US sample in which prestige-based social capital was negatively associated with depression, independent of personal and family socioeconomic resources (Song, 2007). Using a short resource inventory, Ziersch (2005) found that access to resource-based social capital was positively associated with mental health. However, we require prospective studies to evaluate the direction of causality between these variables. To assist us with this task we have developed the Brown-Harris psychosocial model of depression to hypothesise how social capital may affect the course of depression.

## 1.8   Brown-Harris psychosocial model of remission

The Brown-Harris psychosocial model of remission from depression (Harris et al., 2006a; Harris et al., 1999b; Harris and Craig, 2006) has been developed from three decades of research, from their seminal study of the social origins of depression (Brown and Harris, 1978) through to more recent randomised controlled trials of befriending (Harris et al., 2006a; Harris et al., 1999a).

Their model includes a number of factors associated with chronicity, or a lack of recovery from depression such as severe inter-personal difficulties at onset (Brown et al., 1994; Brown and Moran, 1994) and new severe life events (Harris et al., 2006a). However, positive life events, or 'fresh start' events, (Brown et al., 1988; Brown et al., 1992b; Harris et al., 1999b; Ronalds et al., 1997); social support (Brugha et al., 1997); crisis support (Brown and Harris, 1986); and secure attachment style (Harris et al., 1999b) were all associated with recovery or remission.

### 1.8.1   Model of social capital and the course of depression

We adapted the Brown-Harris model to hypothesise potential associations or pathways between the neo-capital theory of social capital and the course of depression. Our model (figure 1.1) superimposed the hypothesised role of social capital on the course of depression (in red) onto a model of variables known to be associated with the course of depression (in black). We have suggested a positive relationship between the concept and recovery. It is equally possible to suggest that a lack of access to social capital, or an abundance of access to negative social capital (for example drug dealers or irresponsible money lenders – depending on the individual's personal situation) may be detrimental for mental health. However, we excluded these from figure 1.1 to provide clarity.

Distal factors in the model are psychosocial variables which determine an individual's access to social capital. Using the variables within the Brown-Harris psychosocial model known to be associated with recovery from depression, we hypothesise that having high self-esteem, few inter-personal difficulties and a secure attachment style will be important to facilitate access to network members' resources. A secure attachment style is beneficial for the interactions required to foster and maintain social capital and it also plays a mediating role in predicting episodes of depression, for example (Bifulco et al., 2006).

**Figure 1.1    Psychosocial model of social capital and recovery from depression**
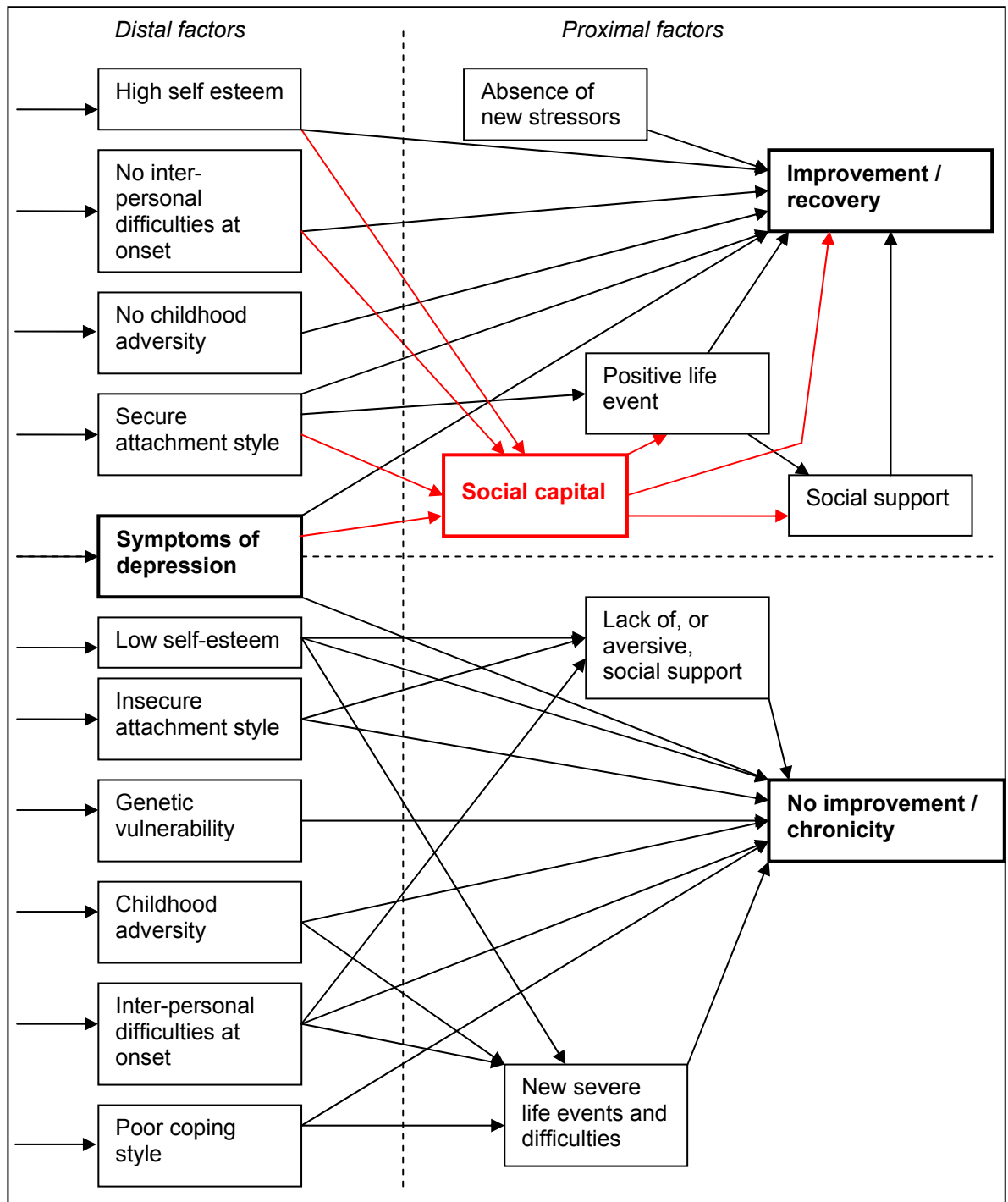


Resource-based and prestige-based social capital may influence the course of depression by initiating a positive life event, or a 'fresh start' event (Brown et al., 1988). For example, as discussed above (section 1.7.4), many people gain employment (Lin, 1999b) or attain promotions to higher status occupations (Lin, 2001) through their informal social networks. For people suffering from depression, these may be the positive life events that prompt recovery.

Secondly, social capital may have a direct effect on the course of depression by its additive effect upon an individual's personal resources. The power and authority of network members, or the extent of their resources, may exert a similar influence that individual socioeconomic position has on depression. These neo-material hypotheses are discussed below (sections 1.8.2-1.8.4).

Finally, the process of accessing social capital may have a psycho-social affect on the course of depression similar to the effect of social support. The knowledge of having a resourceful network that could be accessed may provide a sense of security and belonging that are important for recovery from depression. Additionally, it can be argued that social support is a resource in its own right that could be accessed from within networks. Therefore, it is important to consider the potential confounding effect of perceived social support in any measurement model to ensure that the independent effect of social capital is accurately ascertained. This is particularly important in this study which is only concerned with investigating the independent effect of social capital.

### 1.8.2   Neo-material pathways to recovery from depression

Neo-material explanations for health inequalities highlight the structural aspects within a society which play an important role in determining who receives a good education, gets a good job or a better income (Lynch and Kaplan, 1997). For example, income inequalities are a reflection of:

> "a combination of negative exposures and lack of resources held by individuals, along with systematic underinvestment across a wide range of human, physical, health, and social infrastructure" (Lynch et al., 2000: 1202).

Evidence from UK surveys indicate that neo-material factors such as housing tenure and lack of access to a car, independent of other socioeconomic and demographic variables, are associated with an increased risk of depression (Lewis et al., 1998; Weich and Lewis, 1998a). The specific mechanisms linking material deprivation and depression are not discussed in these studies (Muntaner et al., 2004). However it is possible that social capital may alleviate some aspects of deprivation and assist recovery from depression by facilitating access to resources and material goods.

### 1.8.3    Social production function theory

Social capital may have a direct effect on the course of depression through the mechanisms of social production function theory (Lindenberg, 1990; Ormel et al., 1997). This is a socio-economic theory that proceeds from the basis of rational choice theory which informs Lin's (2001) social capital theory. It proposes that individuals strive for psychological well-being by setting certain instrumental goals (stimulation, external and internal comfort, status, behavioural confirmation and affection). These goals could be met by the provisions of social relationships alone (Weiss, 1974), which are known to be important for mental health (Cutrona and Russell, 1987). However, it is also likely that they could be achieved by taking instrumental actions, the success of which depends on personal resources and those that can be accessed through social networks.

An example of an instrumental action may be searching for a new job, which is often achieved by using contacts within informal social networks (Lin, 1999b). A new job, or employment after a period of unemployment, may help to achieve the instrumental goals of stimulation, status and behavioural confirmation. Access to other social resources such as cheap loans, health and fitness advice, and practical support with domestic jobs from social networks, for example, may help to achieve the goals of internal and external comfort and mitigate some of the losses that are associated with depression (Brown et al., 1986; Finlay-Jones and Brown, 1981; Paykel et al., 1969).

There is some evidence to suggest that overcoming addictive behaviours strongly correlates to the social context and the resources that adhere to a person's social position (Bischof et al., 2003; Tucker, 1999; Tucker et al., 1990-1).  For example, people who have resolved their drug or alcohol dependency without treatment have emphasised the crucial role of social capital in their recovery (Granfield and Cloud, 2001).  Although this has not been established using standardised social capital measures, it does suggest that using social resources to achieve instrumental goals may influence the likelihood of recovery.

### 1.8.4    Inequality in access to social capital

Inequalities in access to social capital may explain differential recovery rates in different populations. For example, in families where both parents work, each partner promotes the career and income of the other, leading to an accumulation of

advantages (Bernasco et al., 1997). However, the loss of social capital in one-parent families through divorce has a detrimental effect on the educational and occupational achievements of the children and of the divorced couple themselves (McLanahan, 1984). Further, research in Taiwan has shown that wives are more reliant on their husband for access to social resources than vice versa (Fu et al., 2004). It is possible that the loss of these resources on divorce or separation may be more detrimental for women than men, affecting the course of depression. Additionally, the gendered nature of social capital itself may mean that its effect on depression may be different for men and women (Erickson, 2004).

## 1.9   Social capital and the treatment of depression in primary care

The National Institute for Health and Clinical Excellence (NICE) guidelines for the treatment of depression (National Collaborating Centre for Mental Health, 2004) emphasize the efficacy of pharmacological and psychological treatments. As access to the latter is not consistent across the UK, a GP's first line of defence against depression is typically a prescription for an anti-depressant drug, leading to calls by politicians that Britain is fast becoming a 'Prozac nation' (Woodward, 2008). The Department of Health is seeking to address this with the national roll-out of the Improving Access to Psychological Therapies (IAPT) programme in 2008.

Social interventions in primary care are sparse. Befriending received the highest evidential rating in the NICE guidelines (National Collaborating Centre for Mental Health, 2004), but there is little evidence of its wide use in primary care despite a high level of support for social approaches to mental health care:

> "Employment, housing and a strong social network are as important to a person's mental health as the treatment they receive" (Appleby, 2007: 1).

More sociological research is required on how to intervene with mild to moderate common mental disorders as the NICE guidelines provide insufficient evidence of this (Middleton et al., 2005). Intervention models such as the ABC-E model of emotion (Briddon et al., 2008), combining a psychological and social approach to the treatment of depression, appear promising but need to be evaluated. Further, interventions that modify interpersonal functioning appear to be effective in influencing the course of depression (Brugha, 2003). We suggest that the neo-capital conception of social capital may provide a theoretical context for these interventions. However, first, we

need to explore the extent to which access to social capital affects the course of depression, which is the subject of this study.

**Chapter 2**

**Systematic review**

# 2   Systematic review

## 2.1   Background

In recent years there have been a growing number of literature reviews on social capital and mental health, but these have focused almost exclusively on the communitarian conceptualisation after Putnam (1993). These reviews have highlighted the complexity of the concept and the often inadequate measurement techniques used to capture it (De Silva, 2006). Their general conclusions are that there is an inverse association between social capital and depressive symptoms at the level of individuals. Three reviews are worth discussing in a little detail.

### 2.1.1   Systematic review of social capital and mental health

De Silva and colleagues (2005) have produced the most rigorous review of the literature to date. They evaluated quantitative studies of social capital in the tradition of Putnam (1993), applying clear inclusion criteria. Studies were included in their review if they had a mental illness outcome measured using a validated tool and aspects of social capital, even if it was not called this. Studies were excluded if the social capital measure could be considered a consequence of social capital, such as homicide rates. Inclusion and exclusion criteria were applied independently by the authors.

They included 21 studies, 14 which measured social capital at the individual level (Aneshensel and Sucoff, 1996; Boreham et al., 2003; Brown et al., 1992a; Dumont, 2002a, b; Ellaway et al., 2001; Harpham et al., 2004; Mitchell and LaGory, 2002; O'Brien et al., 1996; Pevalin and Rose, 2003; Ross et al., 2000; Runyan et al., 1998; Steptoe and Feldman, 2001; Thomas, 2003) and seven at the ecological level (Boydell et al., 2002; Cutrona et al., 2000; Desai et al., 2005; Drukker et al., 2003; Harper et al., 2003; Rosenheck et al., 2001; Stafford et al., 2004). All but three were cross-sectional in design. The diverse studies produced few consistent findings, but the authors found evidence for an inverse cross-sectional association between individual-level cognitive social capital and common mental disorders.

Cognitive social capital was defined in these studies as neighbourhood attachment, trust, social cohesion or perception of neighbourhood spirit by individuals. The results

of the review indicated that people with a common mental disorder were less attached to their neighbourhood, trusted others less, or perceived lower levels of social cohesion or neighbourhood spirit than those without a common mental disorder. There were no consistent results in studies measuring structural social capital or ecological cognitive social capital.

These findings were cross-sectional and no causality could be inferred as the associations may be explained by reverse causality. The dearth of longitudinal studies, which can more reliably establish the time order of predictors and outcomes, makes it difficult to draw conclusions about the associations between social capital and mental health from this review.

### 2.1.2 Interdisciplinary review of social capital and mental health

Almedon's (2005) interdisciplinary review, updated two years later (Almedom and Glandon, 2007), acknowledged the compound and complex nature of social capital, but also did not explore literature within the neo-capital tradition. The 16 studies evaluated in the updated review (Almedom and Glandon, 2007) were mostly cross-sectional (Caughy et al., 2003; Cotterill and Taylor, 2001; Harpham et al., 2004; Mitchell and LaGory, 2002; Rose, 2000; Rosenheck et al., 2001; Steptoe and Feldman, 2001; Stevenson, 1998; van der Linden et al., 2003). Only three studies were longitudinal (Beyers et al., 2003; Drukker et al., 2003; Moffitt and The E-Risk Study Team, 2002), one used a case-control design (Mulvaney and Kendrick, 2005) and, unusually, three qualitative studies were included in the review (Campbell et al., 2004; Fram, 2005; Weine et al., 2004).

The selection of studies for this review seems somewhat arbitrary in the absence of well-defined inclusion and exclusion criteria. Together, they point to the modest salutary effects of neighbourhood social capital upon mental health and reflect the methodological diversity of research within this tradition. However, the diverse methods of measurement of both exposure and outcome make it difficult to reach any firm conclusions about the association of the two variables.

Only five studies were selected for inclusion in both this review and the systematic review conducted by De Silva and colleagues (2005). This in part reflected the different methodological concerns of the reviewers; De Silva and colleagues focused on the epidemiological association between social capital and mental health in quantitative

studies whereas Almedom was interested in developing a multi-disciplinary framework for examining the implications of the results for mental health policy and practice (Almedom, 2005; Almedom and Glandon, 2007). However, Almedom's (2005) broader appreciation of the concept, and acknowledgement that there is more to social capital than just Putnam (1993), may have influenced the selection of studies for his review.

### 2.1.3    Social capital and psychiatry review

Whitley and McKenzie (2005) presented a conceptual and empirical review of the social capital literature for psychiatric epidemiologists and clinicians. They argued that considering social capital as an ecological concept helped to distinguish it from individualistic notions of social support and social networks. Their review therefore focused mainly on studies broadly located within the tradition of Putnam's (1993) understanding of the concept. However, to address conceptual overlaps they discussed in brief some key findings in the social support and social network literature (see section 1.4.5). This did not include a review of the neo-capital conception and associated literature.

Of the studies Whitley and McKenzie (2005) discussed, all except two (McCulloch, 2001; Whitley and Prince, 2005) were also included in De Silva et al's (2005) or Almedom's (2005; Almedom and Glandon, 2007) review. The selection process for the studies included in this review was not made explicit. Also, the results of the studies were not explored systematically and they appeared more as examples of the available evidence than as part of a systematic review. However, they derived some potentially useful considerations for clinical practice, albeit possibly premature considering the nature of the evidence they reviewed.

### 2.1.4    Systematic review of the neo-capital social capital literature

As discussed in chapter one we hypothesise that there are potential associations between social capital, as conceived within the neo-capital paradigm, and mental health. Kawachi and Berkman (2001) refer to cross-sectional evidence (Lin et al., 1999) supporting this view, but do not systematically explore the literature.

The neo-capital paradigm of social capital, although conceptually distinct from social support and social networks (see section 1.4.5), is nevertheless likely to be captured in some of the literature measuring these concepts. The literature on social support and

social networks has been extensively reviewed (e.g. Lin and Peek, 1999; Paykel, 1994; Vilhjalmsson, 1993; Wang, 1998; Wang et al., 2003). It is known that favourable psychosocial environments  are associated with good health (Egan et al., 2008) and that social support has a modest, but generally positive, relationship with mental health (Smith et al., 1994), but there has been no attempt to systematically review studies measuring aspects of the neo-capital paradigm of social capital and its connection to mental health. This chapter presents a systematic review of existing longitudinal studies measuring individual-level social capital and depression.

## 2.2   Aims

This systematic review aims to:

1. Evaluate the association between an individual's access to social capital (as defined within the neo-capital tradition) and depression in existing longitudinal studies.
2. Critically appraise the methodological strengths and weaknesses of existing studies to inform our study and future research.

## 2.3   Method

### 2.3.1   Search strategy

The following strategy was used to identify potentially relevant studies for consideration for inclusion in the review.

#### 2.3.1.1   Electronic databases

We searched 24 electronic databases (see table 2.1) for all available years up to May 2008 using the following search terms:

depress*
AND
"social capital" OR "social resource*" OR "social network*" OR "social support*"
(* = wildcard symbol)

### 2.3.1.2 Reference lists of relevant studies

The reference lists of all the potentially relevant studies identified in the electronic databases and other reviews, commentaries or empirical studies in the social support, social network and social capital field were reviewed to identify further potentially relevant studies.

**Table 2.1        Electronic sources searched**

| Database | Hits | Potentially relevant papers |
|---|---|---|
| ACP Journal club | 13 | 0 |
| AMED | 220 | 3 |
| ASSIA | 806 | 18 |
| British Humanities Index | 2 | 0 |
| British Nursing Index | 95 | 1 |
| CINAHL | 2,641 | 9 |
| Cochrane Central Register of Controlled Trials | 360 | 3 |
| Cochrane Database of Systematic Reviews | 94 | 0 |
| Cochrane Methodology Register | 5 | 0 |
| Database of Abstracts of Reviews of Effects | 44 | 0 |
| EMBASE | 4,695 | 79 |
| Health Management Information Consortium | 116 | 2 |
| Health Technology Assessment Database | 4 | 1 |
| International Bibliography of the Social Sciences | 221 | 4 |
| MEDLINE (inc. in-process and other non-indexed citations) | 5,640 | 82 |
| NHS Economic Evaluation Database | 5 | 0 |
| PsycINFO | 6,324 | 53 |
| Social Care Online | 373 | 2 |
| Social Policy & Practice | 488 | 4 |
| Social Services Abstracts | 2,361 | 4 |
| Sociological Abstracts | 725 | 11 |
| TRIP Database | 74 | 0 |
| World Bank Social Capital Document Library | 6 | 0 |
| WoS (Science, Social Science and Arts & Humanities Citation Indexes) | 6,747 | 74 |
| Zetoc | 406 | 20 |
| **Totals** | **32,465** | **370** |
| **Search engine** | **Hits** | **Additional relevant papers** |
| Google Scholar | >63,000 | 2 |
| Scirus | 118,311 | 0 |
| Scopus | 3,706 | 0 |
| **Totals** | **>185,017** | **2** |

### 2.3.1.3   Internet search engines

We supplemented our searches by using three internet search engines (Google scholar[1], Scirus[2] and Scopus[3]), applying the same search strategy as the electronic databases. As these searches yielded approaching 200,000 citations (see table 2.1) we scanned the 100 most relevant ones within each element of the search. This search encompassed both peer-reviewed journals and the 'grey literature' such as PhD theses or conference papers, to ensure that our results were not unduly affected by publication bias.

### 2.3.1.4   Hand searches

We selected ten journals that have published other papers relevant for this review for hand searching: *Acta Psychiatrica Scandinavica*, *British Journal of Psychiatry*, *American Journal of Psychiatry*, *Journal of Abnormal Psychology*, *Journal of Affective Disorders*, *Journal of Community Psychology*, *Journal of Consulting and Clinical Psychology*, *Journal of Health and Social Behaviour*, *Journal of Nervous and Mental Disease*, *Journal of Personality and Social Psychology*, *Psychological Medicine*, *Social Psychiatry and Psychiatric Epidemiology* and *Social Science and Medicine*. We reviewed the tables of contents for the previous six months (January to June 2008) to identify relevant papers that may not yet have been indexed within an electronic database and papers in-press, where these were available online.

Additionally, we conducted a hand search of papers already collected by the author.

### 2.3.2   Selection criteria

All three inclusion criteria below had to be met for studies to be included within this review.

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[1] http://scholar.google.co.uk/

[2] http://www.scirus.com/

[3] http://www.scopus.com/

**2.3.2.1   Inclusion criteria (1): social capital**

Studies were selected for inclusion in the review if they measured social capital as a predictor variable. Social capital was defined in the neo-capital tradition after Lin (1999a) as: "investment in social relations by individuals through which they gain access to embedded resources to enhance expected returns of instrumental or expressive actions" (p. 39). Although social capital has been conceptualised in this way for only the last decade, some studies of social support and social networks during the last thirty years have measured aspects of our contemporary understanding of social capital. These studies were included in the review if social capital, although not necessarily called this, was measured as a distinct phenomenon from emotional support or measures of the structural aspects of social networks.

An example of a measure that does not meet these inclusion criteria, although empirically defined, is provided by Li and colleagues (2005) who brought together a set of items from the British Household Panel Survey as measuring a 'social network' dimension of social capital. These items measured both aspects of emotional support (e.g. "do you have anyone to listen to you when you need to talk?) and instrumental support (e.g. "do you have anyone outside your household to lend you money?). As emotional support needs to be measured separately to avoid conceptual contamination (see section 1.8.1), we decided to only include studies which measured access to instrumental or informational resources (or other aspects of social capital) within informal networks separately from emotional support. Studies using composite measures of social support were excluded. Also, as social capital is a multi-dimensional concept, studies measuring access to social resources within informal networks using only one item as an indicator, were excluded.

Studies which only measured a quantitative aspect of social networks such as number of friends, contacts or close relationships were not included as social capital is concerned with the resource content of these relationships. Similarly, studies measuring number of confidantes or the quality of a significant relationship were not included because they were unable to capture the resourcefulness of an individual's wider network.

**2.3.2.2   Inclusion criteria (2): depression**

Studies were selected for inclusion in the review if they measured depression as an outcome variable using a validated research instrument. Studies of either the onset or the course of depression were considered for inclusion. Those using composite measures of common mental disorders, which did not separate depression from other neuroses such as anxiety or phobias, were excluded. We only included studies which had depression as an outcome because this was the primary focus of our study and it made the literature search more feasible, given the large number of existing studies on social support, social networks and mental health.

**2.3.2.3   Inclusion criteria (3): longitudinal studies**

Studies were only selected for inclusion in the review if they were of a longitudinal design. This helped us to evaluate more clearly the causal direction of any associations between our predictor and outcome, particularly as cross-sectional associations may be explained by reverse causality.

**2.3.2.4   Exclusion criteria (1): disease-specific studies**

We excluded studies of disease-specific populations to avoid potential effect modification caused by the specific illness. In studies of people with cancer, for example, it would be difficult to evaluate the effect their illness had on the relationship between social capital and depression without including a control group. We excluded these studies at the searching stage and they do not feature in the search results (figure 2.1).

We did not exclude studies of populations which included people with other illnesses within their sample if this was measured and controlled for in the analysis. General population or primary care studies which did not measure other illnesses were also not excluded.

**2.3.2.5   Exclusion criteria (2): age**

We excluded studies of young people and older adults because the primary focus of the current study was of adults of working age. Additionally, there are inherent difficulties in measuring the social capital of these populations which may bias

estimates of the effect of social capital on depression. For example, young people may access the social capital of their parents rather than their own, and the resources that are valued by many older adults may be different from those valued by younger people, particularly those associated with employment or career development. Separate reviews are required to assess the literature in these populations. We applied this exclusion criterion to studies whose sample had a mean age less than 18 or greater than 65.

### 2.3.3    Selection process

We applied our search strategy and developed a list of potentially relevant studies from a review of their abstracts. We studied the methods sections of these papers and screened out studies which did not meet our inclusion and exclusion criteria. The remaining studies were reviewed by the author and two independent reviewers[4] to reach a consensus on their inclusion in the review. Any disagreements were resolved by discussion.

### 2.3.4    Data extraction

Using a structured proforma, the following data was extracted from the studies in the review: setting, population, study design, sample size, measures of social capital and depression, assessment of methodological quality and results. Methodological quality was assessed using the Critical Appraisal Skills Programme (2008) appraisal tool for cohort studies, which investigates selection bias, measurement validity, identification and assessment of potential confounding variables and the reporting of the results.

### 2.3.5    Analysis

The calculation of effect sizes was not possible because the papers selected for inclusion in the review reported insufficient data. The authors who were traced were unable to supply the required data because they had either disposed of it or had misplaced their original analyses. Additionally, the populations studied were heterogeneous and several different measures of the predictor and outcome had been

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[4] Professor Peter Huxley, Professor of Social Work, Swansea University and Dr Tirril Harris, Honorary Research Fellow, King's College London

used making any meta-analysis findings potentially misleading. Therefore we summarised the results of the included papers in table 2.3 to facilitate a comparison.

## 2.4   Results

### 2.4.1   Search results

The database searches produced over 32,000 hits (table 2.1). We reviewed these citations and found 370 that were potentially relevant for inclusion in the review. Once duplicates were removed, we identified 152 unique papers for consideration for inclusion in the review. We reviewed the reference lists of these and over 200 additional papers to identify further potentially relevant studies. 34 additional studies were identified through the citation search and a further one through hand-searching journals. An additional five potentially relevant studies were found from a hand search of previously collected papers and two more that had not already been identified were found using the web search engines (table 2.1).

### 2.4.2   Selection of studies

The potentially relevant papers (n=194) were assessed against the inclusion criteria for the review in two phases, as summarised in figure 2.1. The first phase excluded cross-sectional studies (n=17), review articles that presented no original data (n=2), conference abstracts with no full text available (n=3), a small number of non-English language papers (n=4), the majority of which were also published elsewhere in English, and one paper of an illness-specific population that had eluded our initial screening process.

Of the remaining 167 longitudinal studies which potentially met our inclusion criteria, the majority (n=140) were excluded in the second screening phase because they did not adequately measure social capital according to our definition in section 2.3.2.1 above. A further six papers were excluded due to the unreliable measurement of depression or because it was not used as an outcome measure in the study. Finally, we excluded twelve papers whose sample had a mean age less than 18 or greater than 65 years of age. The excluded papers are summarised in table 2.2.

If a study met our inclusion criteria but the paper did not report relevant analyses, we contacted the paper's authors for additional information. For example, we contacted the

authors of two studies (Blazer and Hughes, 1991; Peirce et al., 2000) as both measured aspects of social capital that fit our inclusion criteria but did not report its effect on depression in their papers. Unfortunately these authors did not have access to the data we required and these papers were excluded from the review.

Nine papers met our inclusion criteria and were included in the review.

**Figure 2.1    Selection of studies for systematic review**
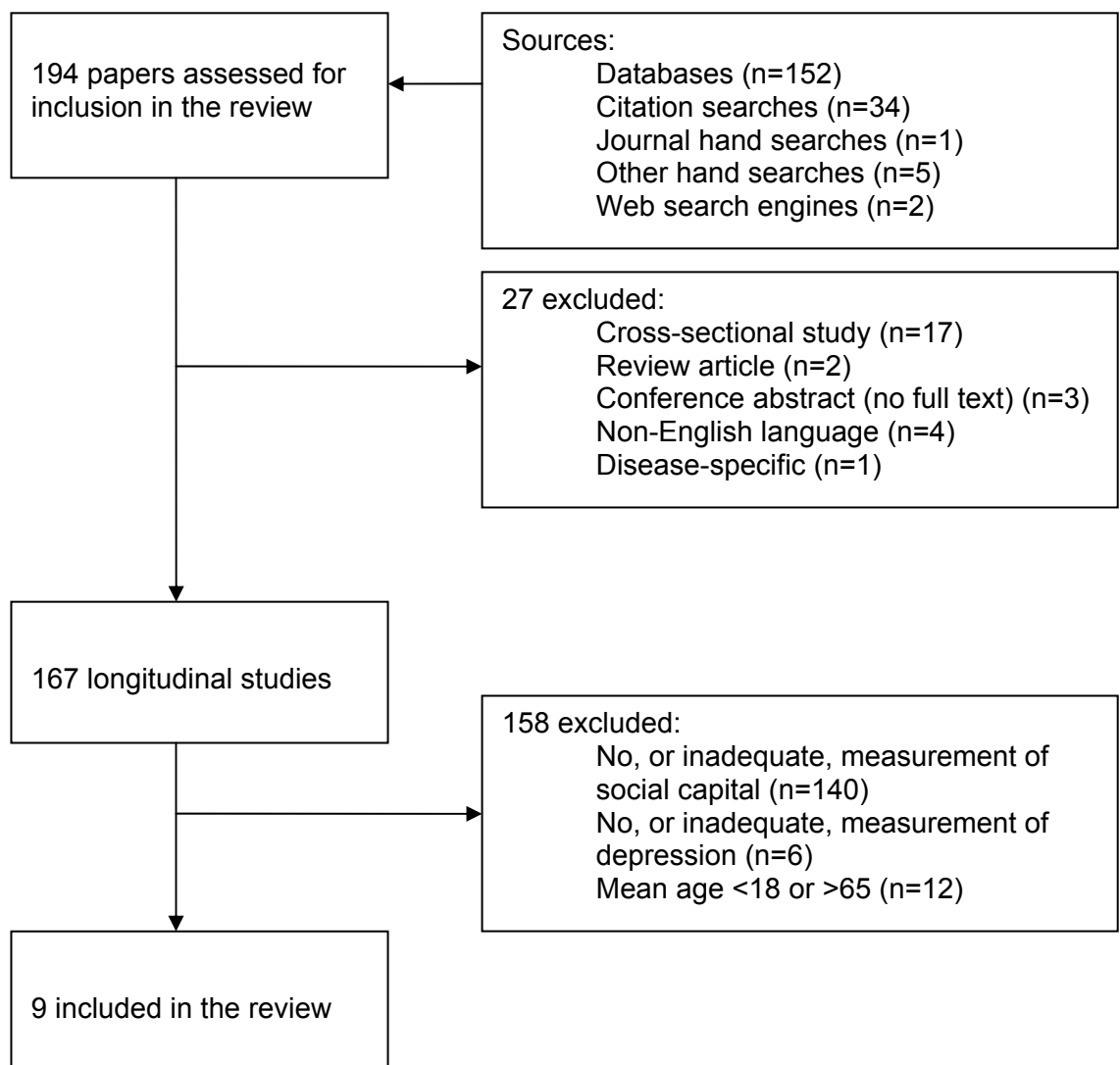
**Table 2.2        Papers excluded from systematic review**

| Exclusion criteria | Papers | | |
|---|---|---|---|
| **Cross-sectional design** | Aneshensel and Stone, 1982<br>Bell et al., 1982<br>Boyce et al., 1998<br>Brugha, 1984<br>Cornelis et al., 1989<br>Dean and Ensel, 1983 | Elmore, 1984<br>Ensel, 1991<br>Flaherty et al., 1983<br>Hobbs, 1997<br>Liabsuetrakul et al., 2007<br>McNaughton et al., 1992 | Mulvaney and Kendrick, 2005<br>Richman and Flaherty, 1985<br>Tijhuis et al., 1995<br>Toro et al., 2008<br>Wethington and Kessler, 1986 |
| **Review papers** | Katschnig and Nutzinger, 1988 | Woolacott et al., 2008 | |
| **Conference abstracts** | Avis et al., 1988 | Blazer, 1988 | Ferdock and McKinlay, 1988 |
| **Non-English language** | Ezquiaga et al., 1995<br>Fukukawa et al., 2005 | Herrero Olaizola and Musitu, 1998 | Lara et al., 2004 |
| **Disease-specific** | Knowlton and Larkin, 2007 | | |
| **No or inadequate social capital measure** | Anderson et al., 2003<br>Andrew et al., 1993<br>Andrews and Brown, 1998<br>Aneshensel, 1985<br>Aneshensel and Frerichs, 1982<br>Aneshensel and Huba, 1984<br>Beard et al., 2008<br>Bessiere et al., 2008<br>Billings and Moos, 1985a,b<br>Blazer and Hughes, 1991<br>Blazer et al., 1992<br>Brookings and Bolton, 1997<br>Brown et al., 1986,1988,1993,1994<br>Brugha et al., 1987,1990a,b,1997,<br>1998,2005<br>Cacioppo et al., 2006<br>Choenarom et al., 2005<br>Cramer et al., 1997 | Honkalampi et al., 2005<br>Horwitz et al, 2007<br>Hughes et al., 1993<br>Husaini and von Frank, 1985<br>Huurre et al., 2006,2007<br>Huxley et al., 1979<br>Joiner 1997<br>Keitner et al., 1992,1995<br>Keller et al 1986<br>Kendler et al., 1993,1997,2005<br>Krantz and Moos, 1988<br>Lackner et al., 1993<br>Lam, 1994<br>Lara et al., 1997<br>Lepore, 1992<br>Lepore et al., 1991<br>Leskela et al., 2006<br>Lewinsohn et al., 1988 | Pearlin et al., 1981<br>Peirce et al., 2000<br>Pelkonen et al., 2003<br>Pevalin and Goldberg, 2003<br>Plaisier et al., 2007<br>Ritter et al., 2000<br>Romans et al., 1993<br>Rubenstein et al., 2007<br>Rytsala et al., 2006<br>Schroevers et al., 2003<br>Schwarzer et al, 1984<br>Sherbourne et al., 1995<br>Sherrington et al., 2001<br>Skarsater et al., 2001,2005<br>Spijker et al., 2001,2004a,b<br>Stansfeld et al., 2003<br>Steinmetz et al., 1983<br>Surtees 1980,1984 |

| | | | |
|---|---|---|---|
| | Cronkite et al., 1998 | Lin and Dean, 1984 | Swindle et al., 1989,1998 |
| | Dalgard et al. 1995 | Lin and Ensel, 1984 | Szadoczky et al., 2004 |
| | Dean and Ensel, 1982 | Lin et al., 1985 | Tang et al., 2007 |
| | Dormann and Zapf, 1999 | McCall et al., 2001 | Taylor and Turner, 2001 |
| | Eaton, 1978 | McLeod et al., 1992 | Tomaszewska et al., 1996 |
| | Ensel and Lin, 1991 | Miller and Lloyd, 1991 | Turner, 1981 |
| | Eurelings-Bontekoe et al., 1995 | Mitchell and Moos, 1984 | Viinamaki et al., 1996,2006a,b |
| | Ezquiaga et al., 1998,2004 | Mittelmark and Bancila, 2007 | Vinokur et al., 1987 |
| | Fernandez et al., 1998a,b | Monroe et al., 1986 | Wade and Kendler, 2000a,b |
| | Frese, 1999 | Moos, 1990 | Wells et al., 1999 |
| | Goering et al., 1983 | Moos et al., 1998a,b | Westdahl et al., 2007 |
| | Grainge et al., 2000 | Murrell and Norris, 1984 | Wildes et al., 2002 |
| | Haeffel et al., 2007 | Nasser and Overholser, 2005 | Wilhelm et al., 1999 |
| | Helgeson, 1993 | Neeleman et al., 2003 | Williams et al., 1981 |
| | Henderson, 1981 | Norris and Murrell, 1984 | Winefield and Tiggemann, 1990 |
| | Heponiemi et al., 2006 | O'Leary et al., 2000 | Wong and Pevalin, 2001 |
| | Hirschfeld et al., 1986 | Oldehinkel et al., 2000 | Ying, 2006 |
| | Hobfoll et al., 2003,2006 | Pagel et al., 1987 | Ystgaard et al., 1998 |
| | Holahan and Moos, 1981,1991 | Patten et al., 2003 | Zlotnick et al., 1996 |
| | Holahan et al., 1999,2000 | Paykel et al., 1996 | Zunzunegui et al., 2002 |
| **No or inadequate measure of depression** | Amann, 1991 | Liebermann and Mullan, 1978 | Ostad et al 1999 |
| | Lam and Rosenheck, 2000 | Lynch et al., 1999 | Stokes and Levin, 1986 |
| **Mean age <18 or >65** | Bosworth et al., 2002a,b | Krause, 1995 | Roberson and Lichtenberg, 2003 |
| | Chou and Chi, 2003 | Krause et al., 1989 | Voils et al., 2007 |
| | Harris et al., 2006 | Mavandadi et al., 2007 | Wojtyna et al., 2007 |
| | Koizumi et al., 2005 | Ramos and Wilmoth, 2003 | |

### 2.4.3 Description of studies

A summary of the nine studies included in the review can be found in table 2.3. All the studies were conducted in the developed world (USA (n=4), Europe (n=4) and Australia (n=1)). They were all prospective longitudinal in design with modest sample sizes (total n=1347, mean n=150, range=73-425). The populations studied were clinical (n=3), college students or graduates (n=3), unemployed men (n=1), women who had just given birth (n=1) and the general population (n=1). Most studies investigated change in depression scores in largely non-depressed cohorts (n=5), though two studied the onset of depression episodes and two studied the course of depression.

None of the studies explicitly measured social capital. However, they all measured social support using separate sub-scales for emotional and practical support. The latter was variously conceptualised as material assistance (Bolton and Oatley, 1987), instrumental support (Boyce and Hickey, 2005; Ezquiaga et al., 1999; George et al., 1989; Veiel, 1993), tangible support (Jung, 1997; Schaefer et al., 1981; Schonfeld, 1991) and practical support (Power, 1988) and was akin to our definition of social capital in section 2.3.2.1.

The instruments used in these studies asked about access to concrete resources that could represent sub-domains of social capital. For example, the Mannheim Interview on Social Support (Veiel, 1990), used in three studies included in this review (Boyce and Hickey, 2005; Ezquiaga et al., 1999; Veiel, 1993), asked respondents if they knew someone who could do small favours for them such as small household repairs or shopping; lend them a large sum of money; care for them if they were gravely ill; and provide advice on a potentially difficult situation such as the threat of losing one's home due to a new road being built. Although it only included a few items, this measure of the potential resourcefulness of an individual's social network was an acceptable indicator of social capital.

These studies provided a more reliable indication of the effect of social capital on depression than cross-sectional studies but they were not without their methodological limitations, which are summarised in table 2.3. The studies predominantly had relatively modest sample sizes which were not informed by power calculations, with only one study (Boyce and Hickey, 2005) having more than 200 respondents at follow-up. The studies largely comprised convenience samples of specific population sub-groups which limits our ability to make generalisations to wider populations. However, the

follow-up rates were above 80% in all the studies except for Jung (1997), Power (1988) and one sub-group of Bolton and Oatley's (1987) study.

A key limitation of the studies included in the review was that potential confounding variables were missing from multivariate analyses. For example, the following variables were not included in multivariate analyses: demographics (Schaefer et al., 1981; Schonfeld, 1991); socio-economic status (Bolton and Oatley, 1987; Ezquiaga et al., 1999; George et al., 1989; Jung, 1997; Schaefer et al., 1981; Schonfeld, 1991); personality features (George et al., 1989; Jung, 1997; Power, 1988; Schaefer et al., 1981; Schonfeld, 1991; Veiel, 1993); and life events (Jung, 1997; Veiel, 1993). Additionally, one study used only a very brief measure of life events (Boyce and Hickey, 2005) and one did not measure life events during the follow up period at all (George et al., 1989). Further, Schaefer et al. (1981) did not control for baseline depression scores and Power (1988) did not control for emotional support in their multiple regression models. Hence the results need to be treated with some caution.

**Table 2.3** **Summary of studies**

| Author (year), study location | Study design, population & sample size | Social capital measure(s) | Depression measure(s) | Methodological limitations | Results |
|---|---|---|---|---|---|
| **Bolton and Oatley (1987)** Brighton, UK | Prospective longitudinal cohort study of depression onset with 6-8 month follow-up<br><br>Unemployed males<br><br>Unemployed group: n=49 at baseline with 71% follow-up (n=35)<br><br>Employed control group: n=49 at baseline with 94% follow-up (n=45) | Material assistance sub-scale of semi-structured interview devised for this study (Bolton, 1984). This estimated the amount of assistance received or available during the month. Items included gifts of money, food, accommodation or clothes, or favours such as babysitting or helping with household repairs. They were scored according to how much they actually received and access to such help if it were needed. | Beck Depression Inventory (Beck et al., 1961) | Testing effect of social capital on onset of depression was not a stated objective of the study<br><br>Non-random allocation to unemployed and employed group<br><br>Employed group was unlikely to be representative as response rate was low (20%) and it was only recruited from public sector industries<br><br>Sample size was not informed by a formal power calculation<br><br>Differential follow-up according to employment group with high loss to follow-up in unemployed group (29%)<br><br>Material assistance sub-scale was not designed to measure social capital and no data on the validity of this measure was available<br><br>Potential confounding variables were only minimally assessed<br><br>No controlling for socio economic status in the regression model | Material assistance at baseline was not associated with depression symptoms at follow-up in either the univariate or multiple regression analyses |

| Author (year), study location | Study design, population & sample size | Social capital measure(s) | Depression measure(s) | Methodological limitations | Results |
|---|---|---|---|---|---|
| **Boyce and Hickey (2005)** Penrith, New South Wales, Australia | Prospective longitudinal cohort study of postnatal depression onset with 6 month follow-up. Females recently given birth in hospital. n=522 at baseline with 81% follow-up (n=425) | Instrumental everyday and crisis support sub-scales of Mannheim Interview on Social Support (Veiel, 1990) | Edinburgh Postnatal Depression Scale (Cox et al., 1987). Diagnosis of depression was confirmed by the Structured Clinical Interview for DSM-III-R (Spitzer et al., 1990) | Testing effect of social capital on onset of depression was not a stated objective of the study. Sample did not include privately insured women, those that did not speak sufficient English and those who had home births. Sample size was not informed by a formal power calculation, although it seems sufficiently large. Antenatal depression was not measured. Instrumental support sub-scales were not designed to measure social capital. Women lost to follow-up were significantly younger than those who completed the study, possibly under-estimating incidence of depression in the sample. Only a brief measure of life events was used | Everyday or crisis instrumental support at baseline was not associated with depression onset at follow-up in either the univariate or multiple regression analyses |

| Author (year), study location | Study design, population & sample size | Social capital measure(s) | Depression measure(s) | Methodological limitations | Results |
|---|---|---|---|---|---|
| **Ezquiaga et al (1999)**<br><br>Madrid, Spain | Prospective longitudinal cohort study of course of depression with 1 year follow-up<br><br>Males and females with major depression attending specialist mental health treatment centres<br><br>n=90 at baseline with 93% follow-up (n=84) | Instrumental everyday and crisis support sub-scales of Mannheim Interview on Social Support (Veiel, 1990) | Hamilton Rating Scale for Depression (Hamilton, 1960) | Testing effect of social capital on course of depression was not a stated objective of the study<br><br>Sample was limited to only people with non-chronic depression (those whose index phase was less than six months in duration)<br><br>Sample size was not informed by a formal power calculation<br><br>No data were provided on recruitment process or response rate<br><br>Socio-economic status was not measured and controlled for in the analysis<br><br>Instrumental support sub-scales were not designed to measure social capital<br><br>No comparison of the baseline characteristics of those lost to follow-up were made with those who were followed-up | Everyday or crisis instrumental support at baseline was not associated with remission from, or improvement in, depression at follow-up in either the univariate or multiple regression analyses |

| Author (year), study location | Study design, population & sample size | Social capital measure(s) | Depression measure(s) | Methodological limitations | Results |
|---|---|---|---|---|---|
| **George et al (1989)**<br>Durham, North Carolina, USA | Prospective longitudinal cohort study of course of depression with 6-32 month follow-up<br><br>Male and female inpatients with major depression<br><br>n=150 (n=200 at baseline with 89% follow-up (n=177), but 27 were excluded as they did not receive a diagnosis of major depression at baseline) | Instrumental support sub-scale of Duke Social Support Index (Landerman et al., 1989) | Center for Epidemiologic Studies Depression Scale (Radloff, 1977)<br><br>Diagnosis of depression was confirmed using the Duke Depression Evaluation Schedule for the Elderly which comprised the Diagnostic Interview Schedule (Robins et al., 1981) and the Mini-mental State Exam (Folstein et al., 1975) | Testing effect of social capital on course of depression was not a stated objective of the study<br><br>Sample size was not informed by a formal power calculation<br><br>No data were provided on recruitment process<br><br>Large variation in follow-up period within sample<br><br>Instrumental support sub-scale was not designed to measure social capital<br><br>No comparison of the baseline characteristics of those lost to follow-up were made with those who were followed-up<br><br>Socio-economic status and personality variables were not measured and controlled for in the analysis<br><br>Life events during follow-up period were not assessed | Instrumental support at baseline was not associated with recovery from, or improvement in, depression at follow-up in either the univariate or multiple regression analyses |

| Author (year), study location | Study design, population & sample size | Social capital measure(s) | Depression measure(s) | Methodological limitations | Results |
|---|---|---|---|---|---|
| **Jung (1997)**<br>California, USA | Prospective longitudinal cohort study of change in depression scores with 10 week follow-up<br><br>Male and female psychology students<br><br>n=236 at baseline with 79% follow-up (n=186) but full data was available for only 165 (70% of cohort) | Tangible support sub-scale of Inventory of Socially Supportive Behaviors (Barrera et al., 1981), modified to provide a measure of balance of support | Center for Epidemiologic Studies Depression Scale (Radloff, 1977) | Testing effect of social capital on course of depression was not a stated objective of the study<br>Restrictive sample reduces generalisability of findings<br>Sample size was not informed by a formal power calculation<br>No data were provided on recruitment process<br>Tangible support sub-scale was not designed to measure social capital<br>No data were provided on the validity of amending the ratings of Inventory of Socially Supportive Behaviors to measure balance of support<br>Short follow-up period in sample of healthy volunteers may under-estimate development of depression symptoms<br>Low follow-up rate (70%)<br>Socio-economic status, life events and personality variables were not measured and controlled for in the analysis | Tangible support at baseline was not associated with change in depression scores at follow-up in multiple regression analysis |

| Author (year), study location | Study design, population & sample size | Social capital measure(s) | Depression measure(s) | Methodological limitations | Results |
|---|---|---|---|---|---|
| **Power (1988)** London, UK | Prospective longitudinal cohort study of change in depression scores with 6 month follow-up<br><br>Mature female psychology students<br><br>n=118 at baseline with 62% follow-up (n=73) | Practical support sub-scale of Significant Others Scale (Power et al., 1988) | 28-item version of General Health Questionnaire (Goldberg and Hillier, 1979) | Testing effect of social capital on depression was not a stated objective of the study<br><br>Restrictive sample reduces generalisability of findings<br><br>Sample size was not informed by a formal power calculation<br><br>Practical support sub-scale was not designed to measure social capital and the use of discrepancy scores obscures actual resources available<br><br>Low follow-up rate (62%)<br><br>Personality variables were not measured at baseline and controlled for in the analysis<br><br>Emotional support was not controlled for in the multiple regression analysis of practical support | Discrepancy between ideal and actual practical support at baseline was positively correlated with depression at follow-up in the univariate analysis (r=0.35, p<0.01)<br><br>Discrepancy between ideal and actual practical support at baseline was also positively correlated with depression at follow-up in the multiple regression analysis (β=0.62, p=0.03) |

| Author (year), study location | Study design, population & sample size | Social capital measure(s) | Depression measure(s) | Methodological limitations | Results |
|---|---|---|---|---|---|
| **Schaefer et al (1981)**<br>Alameda County, California, USA | Prospective longitudinal cohort study of change in depression scores with 7 month follow-up<br><br>General population<br><br>n=109 at baseline with 92% follow-up (n=100) | Tangible support sub-scale of the Social Support Questionnaire designed for this study. This asked respondents if they had someone to whom they could go for help in nine different situations in which support would be required. These ranged from minor (being able to borrow a cup of sugar) to major such as needing care following an illness or injury. They also included instances in which the respondent received helpful information in finding a job or buying a car. | Hopkins Symptom Checklist (Derogatis et al., 1974) | Testing effect of social capital on depression was not a stated objective of the study<br><br>Modest participation rate (50%)<br><br>Sample was predominantly of high income, white, middle-aged, well-educated people<br><br>Sample size was not informed by a formal power calculation<br><br>Tangible support sub-scale was not designed to measure social capital and it has a low internal consistency<br><br>Personality variables were not measured at baseline and controlled for in the analysis<br><br>Baseline depression scores, socio-economic and demographic variables were not controlled for in the multiple regression analysis | Tangible support at baseline was negatively correlated with depression at follow-up in the univariate analysis (r=-0.24, p<0.05)<br><br>Tangible support at baseline was also negatively correlated with depression at follow-up in the multiple regression analysis (β=-0.20, p<0.05) |

| Author (year), study location | Study design, population & sample size | Social capital measure(s) | Depression measure(s) | Methodological limitations | Results |
|---|---|---|---|---|---|
| **Schonfeld (1991)** New York, USA | Prospective longitudinal cohort study of change in depression scores with 4 month follow-up<br><br>Female college graduates<br><br>n=125 at baseline with 82% follow-up (n=102) | Tangible assistance sub-scale of Interpersonal Support Evaluation List (Cohen et al., 1985) | Center for Epidemiologic Studies Depression Scale (Radloff, 1977) | Testing effect of social capital on depression was not a stated objective of the study<br><br>Restrictive sample reduces generalisability of findings<br><br>Sample size was not informed by a formal power calculation, although post-hoc power analysis was undertaken<br><br>Tangible assistance sub-scale was not designed to measure social capital<br><br>Personality variables were not measured at baseline and controlled for in the analysis<br><br>Socio-economic and demographic variables were not controlled for in the multiple regression analysis | Tangible assistance at baseline was negatively correlated with depression at follow-up in the univariate analysis (r=-0.23, p<0.05)<br><br>However, tangible assistance at baseline was not correlated with depression at follow-up in the multiple regression analysis (β=-0.06, p>0.05) |

| Author (year), study location | Study design, population & sample size | Social capital measure(s) | Depression measure(s) | Methodological limitations | Results |
|---|---|---|---|---|---|
| **Veiel (1993)** Mannheim, Germany | Prospective longitudinal cohort study of change in depression scores with 6 month follow-up Male and female discharged inpatients with major depression n=190 at baseline with 88% follow-up (n=168) | Instrumental everyday and crisis support sub-scales of Mannheim Interview on Social Support (Veiel, 1990) | Inventory to Diagnose Depression (Zimmerman et al., 1986) and expanded version of the Present State Examination (Maurer et al., 1989) | Testing effect of social capital on depression was not a stated objective of the study Sample size was not informed by a formal power calculation Respondents lost to follow up were more depressed and less sociable than sample followed-up Instrumental support sub-scales were not designed to measure social capital Personality covariates and life events were not measured at baseline or during follow-up and controlled for in the analysis | Kin instrumental everyday support at baseline was negatively correlated with depression at follow-up in the multiple regression analysis including support network size for non-depressed participants (partial correlation r=-0.31, p<0.01). However, when entered into the regression model with psychological everyday and crisis support, it became non-significant. |

### 2.4.4    Study results

The majority of studies (7/9) found no effect of social capital on depression after controlling for confounding variables in their multiple regression models. However, the remaining two studies (Power, 1988; Schaefer et al., 1981) both found that higher social capital at baseline was associated with lower depression scores at follow-up. Power (1988) reported a positive association between the discrepancy between ideal and actual practical support at baseline and depression scores at follow-up six months later. As the difference between participants' ideal and actual practical support decreased, their depression scores increased less at follow-up. The author tested for a stress-buffering effect of practical support but found none, concluding that it was a main effect. Schaefer (1981) found a negative correlation between tangible support at baseline and depression scores seven months later. Participants with more tangible support at baseline were less depressed at follow-up.

Two additional studies found associations between social capital at baseline and depression at follow-up, which became non-significant when controlling for confounding variables. Schonfeld (1991) found that tangible assistance at baseline was negatively correlated with depression at follow-up in a univariate analysis, but this association became non-significant in the multivariate regression model. Additionally, Veiel (1993) found that instrumental everyday support at baseline was negatively correlated with depression at follow-up in a multiple regression analysis including support network size. However, when entered into a more meaningful regression model with psychological everyday and crisis support, it became non-significant.

## 2.5    Discussion

### 2.5.1    Methodological limitations of the review

There are inherent difficulties in conducting systematic reviews in the interstice between social science and medicine. Within and between these literatures the meanings of social phenomena are frequently contested and concepts are evaluated from multiple perspectives. Inconsistency in the use of terminology can occur as a result of epistemological disagreement or inaccuracy (Curran et al., 2007). Further, searches from social science databases may produce more spurious and less consistent results than medical databases because of the inconsistent use of keywords

(Curran et al., 2007). Therefore, it is possible that in spite of our comprehensive search strategy, some relevant papers may have been inadvertently missed.

This review is a post-hoc analysis of the social support evidence-base imposing a contemporary concept of social capital onto an older literature. Included studies did not set out to measure the neo-capital conception of social capital, limiting the conclusions we can draw about the studies included. However, this is not merely a review of the literature on practical support; if this were the case we would not have excluded so many studies. The few that were included all measured aspects of the neo-capital conception of social capital which helped to ensure a high level of internal consistency within the review. It was not possible to include any studies that explicitly measured social capital as our search did not uncover any longitudinal studies within the neo-capital tradition of the concept.

The rigorously defined inclusion criteria necessitated a careful sift through thousands of citations which were refined to under 200 papers. As described above, these were narrowed down to nine. The exclusion of numerous studies has possibly resulted in an under-estimation of the effect of social capital on depression that a more heterogeneous review may have found. On the other hand, our review may have over-estimated the effect and be subject to a publication bias as our grey literature search did not uncover any unpublished studies which met the inclusion criteria. However, considering the inherent limitations of the nine reviewed studies, it is possible that any widening of the inclusion criteria may have diminished the overall quality of the studies in the review even further making it even more difficult to reach any firm conclusions. For example, in their review of case management for people with severe mental disorders, Marshall et al. (1998) excluded a large number of studies because of inadequately validated instruments to strengthen the quality of their review.

### 2.5.2  Strengths of the review

This systematic review has evaluated the effect of social capital, as conceived within the neo-capital paradigm, on depression. To our knowledge, this is the first systematic review of the social support literature through a social capital lens and compliments the existing reviews of social capital and mental health (see sections 2.1.1-2.1.3). Its broad search strategy encompassing a number of databases (table 2.1) helped to ensure that as many relevant studies as possible were identified, as a search restricted to either just social science or medical databases would not have been comprehensive enough

(Taylor et al., 2003). It provides a succinct evaluation of the state of our knowledge about the effect of social capital on depression within observational studies. Its exclusion of cross-sectional studies avoids potential difficulties in interpreting causality in the association between these variables, although the longitudinal studies included in this review are not without their limitations.

This review has taken a different approach to previous reviews of the social capital and mental health literature by only including studies which have measured the neo-capital conception of social capital, even if it was known by different names. The nine papers reviewed here used social support sub-scales which are brief inventories of concrete social resources accessible through social networks, akin to Lin's (1999a) neo-capital definition of social capital. These papers have variously termed this instrumental, tangible or practical support, for example. We conducted a detailed review of questionnaire items to ensure the neo-capital definition of social capital was measured (however incompletely) to increase the homogeneity of the review. This makes this review distinct from prior systematic reviews which have included studies measuring concepts as diverse as social cohesion, group participation, trust, civic action and social harmony under the banner of social capital (e.g. De Silva et al., 2005).

This review only included studies that measured depression as an outcome using well validated tools. This increased our certainty that the studies were measuring the same outcome, although limits our ability to draw conclusions about the effect of social capital on other diagnoses such as anxiety, psychosis or bi-polar affective disorder, for example, which need to be the focus of separate reviews.

A further strength of the review is that the included studies largely controlled for the effect of perceived emotional support, known to ameliorate symptoms of depression (see section 1.4.5.2), providing a good estimate of the independent effect of social capital on depression.

### 2.5.3   Discussion of results

The evidence provided in this review suggests that an individual's access to social capital has negligible effect on both the onset and the course of depression. All but two studies found no association between our predictor and outcome of interest. Common to many of the studies, although not reported in table 2.3 to avoiding shifting our focus away from social capital, consistent predictors of lower depression scores at follow-up

were the affective components of social support. For example, associated with improved outcomes were subjective satisfaction with support (Ezquiaga et al., 1999; George et al., 1989), an increased sense of belonging (Schonfeld, 1991) and emotional support, which buffered the potentially harmful effect of life events (Power, 1988). The only counter-intuitive finding in these papers was provided by Veiel (1993) who found that kin psychological support was associated with an increase in symptoms for women recovered from depression at baseline.

The positive effects of social capital found in this review occurred in two studies with non-clinical populations in which the prevalence of severe depression was low (Power, 1988; Schaefer et al., 1981). The only observed effect in a clinical population, albeit as a joint effect with size of support network in a regression model which failed to control for the effect of emotional support, was in a sub-sample of people discharged from hospital who were recovered at baseline (Veiel, 1993). These results tentatively suggest that if social capital has any effect on depression, it is most efficacious when people are relatively symptom free and functioning well. It could either help to maintain mental health or assist later in the process of recovery from depression, perhaps when people are well enough to access the resources available within their networks. For example, as discussed in section 1.7.4, empirical findings have shown that knowing the right people with the right resources can be effective in the search for employment or attaining a higher status (Flap and Völker, 2001; Lin, 1999b; Lin et al., 1981). It is likely that people suffering from severe depression will have less use for this kind of social capital until they are sufficiently recovered to contemplate a return to work or an ascent up the social hierarchy.

The reliability of these findings is significantly compromised by the quality of the studies from which they are drawn. Specifically, the two studies demonstrating a beneficial effect of social capital on depression failed to include important variables in their regression models. Power's (1988) regression models were constructed to evaluate the separate effects of practical and emotional support on depression. The findings we report in this review on the effect of practical support on depression are from a regression model that did not control for the possible confounding effect of emotional support. Schaefer et al's (1981) regression model did not control for depression scores at baseline because, the authors claim, there was little variation in depression over the course of the study making it difficult to evaluate the effect of the predictors on change in depression over time.

The included studies were originally published an average of 16 years (range=3-27 years) prior to the completion of this review in 2008. Considering that the data on which they were based is even older, dating back to 1977 in one case (Schaefer et al., 1981), this review arguably lacks contemporaneity. As outlined in table 2.3, these older studies are beset with methodological limitations. Modest sample sizes not informed by power calculations, regression models excluding some potentially relevant confounding factors and high attrition rates in some studies combine to raise doubts about the reliability of their results. Above all, none of these studies explicitly set out to evaluate the effect of the neo-capital conception of social capital, which has only recently been articulated, on depression. This was neither considered in their hypotheses nor their sample size considerations. Irrespective of the similarity of the measures used with the neo-capital conception of social capital, we cannot ignore that they have not been validated as measures of this construct. Therefore any conclusions we reach about these studies must be accepted with some caution.

### 2.5.4    Conclusion

In her systematic review of social capital and mental health, De Silva (2005) acknowledged that she did not attempt to review the social support literature to explore the relationship between these two variables. This review has attempted to do just this with the neo-capital conception of social capital as our predictor and depression as our outcome.

The inclusion of only longitudinal studies has helped us to be more certain of the direction of causality between the two variables. However, we have revealed that our knowledge about the connections between social capital and depression is actually still quite poor. The studies included in this review are dated, with a number of methodological limitations and do not provide a consistent or reliable estimate of the effect of social capital on either the onset or course of depression. Further longitudinal studies of the effect of social capital on depression are required, using well validated and psychometrically robust tools. This current study aims to contribute to this evidence base.

# Chapter 3
# Aims and hypotheses

# 3   Aims and hypotheses

## 3.1   Thesis aims and objectives

In chapter one, we hypothesised that social capital, as defined within its neo-capital conception, may influence the course of depression. There is cross-sectional evidence of an association of prestige-based social capital and depression (Song, 2007; Song and Lin, in press), but no longitudinal evidence to help us evaluate the direction of causality between the two variables.

Chapter two presented a systematic review of longitudinal social support studies which measured elements of the neo-capital conception of social capital. The review found little evidence for an effect of social capital on depression. However, the studies included in the review were beset with methodological limitations that restrict the conclusions we can draw about them.

There is a paucity of evidence about the potential effect of social capital on the course of depression and this thesis aims to contribute to this evidence base. Specifically, it has the following objectives:

1) To develop and validate standardised measures of resource-based and prestige-based social capital for use in the UK. The development of these instruments is reported in chapter four.
2) To recruit and follow-up a prospective cohort of people with depression to evaluate the effect of social capital on the course of their illness. The method of the cohort study is presented in chapter five and the results in chapter six.
3) To consider the clinical implications, if any, of the effect of social capital on the course of depression in primary care settings. The discussion of findings is presented in chapter seven.

## 3.2   Research hypotheses

Based on the theoretical models presented in chapter one and the systematic review of the literature in chapter two, this thesis will test the following hypotheses:

1) People with depression with access to more social capital will improve more over six months. This effect will remain after controlling for confounders such as social support, attachment style, life events and clinical features of depression.

2) People with depression with access to more social capital will perceive a greater improvement in their subjective quality of life over six months. This effect will remain after controlling for confounders such as social support, attachment style, life events and clinical features of depression.

**Chapter 4**

**Instrument development**

# 4    Instrument development

## 4.1    Background

### 4.1.1    Introduction

Measures of social capital within the neo-capital tradition have often been developed pragmatically for use in social surveys and other studies. Items have largely been derived by investigators and the length of instruments has been influenced more by respondent burden than psychometric concerns. Also, tests for reliability or validity have frequently been post-hoc and not integral to the development of the measure. Therefore, we rigorously pre-tested our social capital instruments to ensure that they measured accurately what they set out to measure; particularly as social capital measures can be highly culturally dependent.

This chapter provides an account of the development and validation of the two social capital measures used in this study – the Resource Generator-UK and the Position Generator-UK. The former is a measure of resource-based social capital and the latter measures prestige-based social capital, both within the neo-capital tradition. We begin with a discussion of measurement considerations and the three types of instruments that have been used to measure social capital. This is followed by a justification of the choice of social capital measures for use in this study and a full account of their development and validation.

### 4.1.2    Social capital measurement considerations

Lin's (2001) social capital theory contains several propositions which have implications for measurement strategies. He proposed that those who were higher within social structures were more likely to access and use better social capital, highlighting the importance of measuring individual socioeconomic position within studies. However, people at all levels within social structures adopt a variety of strategies to access better social capital.

Lin developed theoretical propositions about the strength of relationships from Granovetter's (1973) earlier work. Strong ties (relationships characterised by greater

intensity, more frequent interaction, higher trust and reciprocity) are more likely to be used for the sharing and exchange of resources (Lin, 2001). These expressive actions are useful for maintaining one's own resources. In contrast, weaker ties (relationships between people which act as a bridge between different social groups) allow access to more heterogeneous resources. These ties have the capability to provide different resources than are accessible within an individual's immediate social group, which are useful for instrumental actions (see section 1.4.4).

Lin developed Burt's (1992) theory of structural holes to propose that individuals who develop relationships which span gaps in social structures to groups that occupy relatively higher social positions will have access to potentially better social capital. Therefore, an individual's location within their social network could prove useful in their search for better social capital. It can also be beneficial in an individual's search for more social capital.

The volume of social capital that an individual has access to is a key consideration of measurement strategies and was central to Bourdieu's (1980) conceptualisation. A greater volume of social capital can help to sustain psychological well-being from the perspective of social production function theory (see section 1.8.3) (van der Gaag, 2005). Social capital can be substituted for personal resources during times of illness, for example, helping to maintain momentum towards the achievement of personal goals. The volume of social capital can be measured by asking individuals about all the people they know and all the resources that these people possess. Name generators adopt this approach and will be discussed below (section 4.1.3).

Alternatively, better social capital may be conceived as more diverse social capital. Having access to a diversity of social resources may increase the likelihood of accessing useful social capital (Erickson, 2003; Flap, 1991). Access to more diverse resources increases the likelihood that the right resources can be located when needed (van der Gaag, 2005). As it is likely that social capital is infinitely diverse, this aspect of the concept needs to be considered within measurement strategies.

A further consideration is whether to measure access to, or use of, social capital (van der Gaag and Snijders, 2004). The former refers to:

> "an accumulated potential that could be mobilized by an individual should the occasion call for it" (van der Gaag and Snijders, 2004: 202).

This represents the potential social capital available to an individual in contrast to its actual use. Measurement of only the use of social capital focuses attention on the outcomes associated with it. However, as only a small portion of potential social capital is actually mobilized, measures focusing on this will neglect inequalities in access to social capital which may also be strongly associated with outcomes. Social capital measures tend to measure access more frequently than use as it produces more reliable results (van der Gaag and Snijders, 2004).

### 4.1.3    Name generators

Name generators have the potential to comprehensively measure an individual's social capital by mapping out an individual's entire social network. This interview measure asks respondents to recall all their network members using either an open question or structured prompts to aide recall. McCallister and Fischer (1978) developed a version in which respondents were asked to name people with whom they have exchanged resources or could do so in the future. This allowed for a comprehensive assessment of resources that can be obtained through them. However, there are several limitations with this method. It imposes a substantial burden on the researcher and respondent, produces incomparable findings and focuses on the structure of social relationships within networks rather than the resources that inhere within them (van der Gaag and Snijders, 2005).

### 4.1.4    Position generators

The position generator (Lin and Dumin, 1986) arose from Lin's (1982) social resources theory, which became integral to his social capital theory (Lin, 2001). The instrument asks respondents whether they personally know people with certain occupations within their social network. These are seen as representing job prestige-based collections of social resources in a hierarchically modelled society, and therefore measures prestige-based social capital. The availability of resources is confirmed by measuring the strength of tie through which occupations are accessed: family members, friends or acquaintances.

The original position generator was a list of occupations from the US census. Occupations were ranked according to job prestige and the most popular occupations are selected from equal intervals of the job prestige scale (Nakao and Treas, 1990). The instrument can be both efficiently administered and easily adjusted for different

populations. However, it doesn't produce specific data about social resources (van der Gaag and Snijders, 2005).

### 4.1.5    Resource generators

Resource generators are a new addition to the family of social capital measures. The original resource generator (van der Gaag and Snijders, 2005) was developed in The Netherlands to give an overview of the distribution of access to social resources within a population (Flap, 1999) and to facilitate studies exploring how these resources may assist individuals to achieve their goals. The instrument measures access to social resources rather than their use.

The resource generator is in the methodological tradition of the name and position generators. The resource generator combines the positive aspects of both instruments by referring to specific resources in an efficient questionnaire format (Snijders, 1999). It asks respondents about access to a fixed list of social resources that represent multiple domains of social capital and their relationship to the person through whom they could access that resource. As social resources are culture and context dependent, different versions of the resource generator need to be validated for different populations. Although this increases reliability within studies it may produce some incomparability problems across populations (van der Gaag and Snijders, 2005).

The resource generator was first used in a Social Survey of the Networks of the Dutch (SSND) (van der Gaag and Snijders, 2005) and has subsequently been developed for use in Canada, Bolivia and Belarussia. Item construction in the Dutch resource generator was theoretically driven, but not extensively pre-tested. To our knowledge, no studies using the resource generator methodology have conducted a thorough content validation process or tested the reliability and validity of the instrument beyond an examination of its internal scales (van der Gaag and Snijders, 2005). This is particularly important as it has great potential to test hypotheses about connections between access to social resources and health status with more precision than the position generator (van der Gaag et al., 2008).

### 4.1.6    Social capital measures used in this study

We chose to measure social capital using the resource generator and position generator in our study. These appeared to be the most reliable methods for measuring

social capital consistently within a population and were brief enough so that if used alongside measures of potential confounders would not create undue respondent burden. They could also be validated for self-complete use, which was necessary as our study relied upon this method of data collection. As we were not using interviews to collect data to test our hypotheses, it was not possible to use a name generator.

## 4.2 Aims and objectives

This chapter reports the instrument development phase of our study which aimed to validate the resource generator and position generator, as used in the SSND (van der Gaag and Snijders, 2005), for use in the UK general population. We consequently developed two new instruments – the Resource Generator-UK (RG-UK) and the Position Generator-UK (PG-UK). Specifically, we aimed to:

1. Establish the content validity of the new instruments through a qualitative process of reviewing items and amending them for the UK population as appropriate.
2. Test the convergent validity of the RG-UK and PG-UK and their divergent validity with a measure of locus control (Coleman and DeLeire, 2003).
3. Test their known-group validity by administering the instruments to a sample of academics. As higher educational attainment correlates with greater access to social capital (Erickson, 1996; Lin and Dumin, 1986), they were expected to have significantly higher scores than a general population sample.
4. Explore their internal domains and establish their internal reliability using Mokken scaling (Mokken, 1997), a method derived from item response theory.
5. Establish their test-retest reliability by administering the instruments to a general population sample twice, with a two-week interval in between.
6. Obtain normative general population data for the RG-UK and PG-UK.
7. Explore how access to resource-based and prestige-based social capital may vary according to the likely presence of a common mental disorder within a general population sample.

## 4.3   Method

### 4.3.1   Development of RG-UK alpha version

The first alpha (α) version of the RG-UK (Appendix A, RG-UK α1) was very similar to the English translation of the Dutch version (van der Gaag and Snijders, 2005). We made a few amendments to make it accessible to a UK respondent. For example, we amended item 8 from "has senior high school (VWO) education" to "has A levels". We also changed the currency to sterling.

van der Gaag and Snijders (2005) included in their analysis four items that were recoded from their name generator. We amended and kept two of these items (Appendix A, RG-UK α1, q.2, items 14 & 15), but discarded the others as they largely repeated previous ones.

### 4.3.2   Development of PG-UK alpha version

To assist us in selecting occupations for the PG-UK, we devised a basic prestige scale using the Standard Occupational Classification (Office for National Statistics, 2000) that was developed for the 2001 census (Office for National Statistics, 2003). We multiplied the occupational skill level of each occupational group by the inverse occupational tier to produce a range of 1 to 36. For example, corporate managers are in occupational tier 1 at skill level 4. As there are 9 occupational tiers, its inverse tier becomes 9. Thus a score of 36 was achieved (Appendix C, table C1).

We selected one occupation from each occupational group to ensure that the instrument reflected the diversity of occupational prestige in the UK. An additional occupation was selected for those groups with over 1 million members according to the 2001 census (Office for National Statistics, 2003), to enhance its representativeness. Occupations were selected on the basis that they were most likely to be familiar to the majority of the UK general population (Appendix C, table C1).

There was a strong correlation between this scale and the Dutch Position Generator (van der Gaag et al., 2008) (r=0.88, p<0.01). As this correlation was so strong, a case could be made to use the Dutch measure so that results could be directly compared. However, we decided to validate a version for the UK to ensure that it was culturally

specific. The 34 occupations were included in the first version of the PG-UK (Appendix B, PG-UK α1).

### 4.3.3    Focus groups

Focus groups of people from the UK general population were used to explore the relevance of the items in the RG-UK and PG-UK alpha versions and to produce new ones. Focus groups were used because they are an effective way of obtaining research participants' views on questionnaires or interview schedules (Elbeck and Fecteau, 1990; Gigantesco et al., 2003; O'Brien, 1993), for developing culturally-relevant research instruments (Hughes and DuMont, 2002; Kitzinger, 1995) and for generating additional ideas (Kitzinger, 1994; Knodel, 1993; Morgan and Kruegar, 1993).

### 4.3.3.1    Sample

We adopted a maximum variation sampling strategy (Patton, 2002) for the recruitment of focus group participants to achieve a broad range of perspectives on useful social resources. As it is likely that people place different value on social resources according to their age, gender, socio-economic status, ethnicity, health status and where they live, we aimed to make the groups as diverse as possible on the basis of these variables. Our sampling strategy was designed to maximise the range of views obtained and to minimise bias that may occur with convenience sampling.

We recruited in two areas to achieve as much diversity as possible. Firstly, the London Borough of Croydon was selected for its ethnic and socio-economic diversity (Appendix C, table C2). It is a suburban borough of south London and ranked 140 out of 354 local authorities in the 2004 indices of deprivation (Noble et al., 2004).

We also recruited in Doncaster, a market town in South Yorkshire with a hinterland of open countryside and large villages, many of which were adversely affected by the demise of the coal mining industry. It is ethnically homogenous (Appendix C, table C2) but more socio-economically deprived than Croydon, ranking 40 out of 354 in the index of deprivation (Noble et al., 2004).

We recruited via newspaper advertisements and posters in public places, such as GP surgeries and libraries, as this has been a cost-effective and successful means of

recruiting in other studies (Brown, 1999). However, as we only received 20 responses we invited all respondents to attend. As two were unable to attend on the dates provided, we held three groups in the two areas with a total of 18 participants. In addition, we held a focus group of four MSc students at the Institute of Psychiatry. This number of participants was large enough to generate a broad range of views, but small enough to allow active participation from all members.

The sample was socially and demographically heterogeneous. For example, 14 (63.6%) of the sample were women, five (22.7%) were non-white British, eight (36.4%) were aged under 30 and three (13.6%) were aged over 60, and all the major groups of the Standard Occupational Classification (Office for National Statistics, 2000) were represented.

An open recruitment strategy is susceptible to bias if it attracts people who routinely attend focus groups for financial or other incentives (Kruiger, 1994). As only two (9.1%) of our participants had been involved in focus groups before, this was unlikely to be a problem with our sample. Further, we screened our participants by telephone (except for the student focus group) to ensure that they had an interest in the subject prior to inviting them to attend a group.

### 4.3.3.2   Procedures

The focus groups in Doncaster and Croydon were held in a meeting room of a local voluntary association, as this was an accessible, neutral and non-threatening location. The author facilitated the groups whilst a colleague took notes of the sequence of the discussion. Refreshments were provided and participants were paid for their time. The student focus group was held in a classroom environment and these participants were not paid.

In order to familiarize the participants with the RG-UK and PG-UK we asked them to complete the α1 versions (Appendices A&B) whilst waiting for the group to begin. Following general introductions, we initiated a discussion about reciprocity in social relationships and whom the participants ask for help or assistance if they required any. Then we examined the instructions for completion of the prototypes. In particular, we asked the participants to give their understanding of the questions and whether the relationship categories were meaningful.

In order to help us to eliminate irrelevant items in the RG-UK, we asked the participants to individually rate how likely they were to need to ask someone for each skill or resource using the scale in table 4.1.

**Table 4.1        Focus group item rating scale**

| Score | Rating |
|-------|--------|
| 1 | Highly unlikely |
| 2 | Quite unlikely |
| 3 | Don't know |
| 4 | Quite likely |
| 5 | Highly likely |

This exercise initiated a discussion about whether or not items were relevant for group members, a process often neglected in instrument development (Atkinson and Lennox, 2006), and suggestions were invited on amendments or additions that participants would like to make to the prototype. When discussion faltered, prompts were provided to consider the five goal attainment domains (van Bruggen, 2001) that informed the development of the Resource Generator (van der Gaag and Snijders, 2005).

Finally, we initiated a discussion about the PG-UK. Firstly, we asked about the participants' understanding of the question. Then, we asked if any of the occupations were too obscure and invited suggestions for replacements.

The topic guide for the focus groups remained fairly constant throughout the life of the groups. However, we used grounded theory (Glaser and Strauss, 1967) to integrate emerging themes and insights generated by previous groups into successive group discussions. The duration of the groups was between 45 minutes and 1 hr 45 minutes.

### 4.3.3.3   Analysis

The focus groups were tape-recorded and transcribed in full. Each individual's contribution was attributed to him or her in the transcript to facilitate a socio-demographic analysis of the responses. The tapes were reviewed after each group to allow for modifications to the topic guide as an iterative process (Brown, 1999).

The transcripts were analysed and coded using NVivo v2.0 (QSR International, 2002). The coding schema developed iteratively throughout the analysis as new themes

emerged. It can be summarised using the following headings: asking for resources; reciprocity; definitions of relationships; social networks; stem questions; items.

Positive and negative comments relating to the items of the RG-UK and PG-UK prototypes were sub-coded into 'relevant' and 'irrelevant'. Suggestions for new items were coded separately.

### 4.3.4    Expert Panel

An expert panel, using the nominal group technique (van de Ven and Delbecq, 1972), reviewed the questions and items for RG-UK and the PG-UK. This technique determines the extent to which experts agree about a given issue and it can be used to resolve disagreements (Jones and Hunter, 1995). It was chosen for our purpose as it avoided a dominant personal or professional view distorting the outcome and ensured that a consensus was reached (Fink et al., 1984). This method has been used for translating research instruments (Sumathipala and Murray, 2000) and identifying measures for clinical trials (Gallagher et al., 1993), for example.

#### 4.3.4.1    Sample

Nine academics with research experience in sociology or social epidemiology were recruited for the expert panel from King's College London and University College London. All were familiar with the concept of social capital. Unfortunately two were unable to attend the panel meeting, leaving a panel of seven.

#### 4.3.4.2    Procedures

Panel members were sent information about the Resource Generator (a pre-publication version of van der Gaag and Snijders, 2005) and version α2 of the RG-UK (Appendix A) prior to the meeting. They were asked to rate how useful they thought each of the RG-UK items are to the man or woman on the 'Clapham omnibus' on a scale adapted from Jones and Hunter (1995) (table 4.2). They were also asked for their comments on the stem questions and their ideas for new items, or amendments to existing ones.

**Table 4.2        Pre-panel rating scale**

| Score | Rating |
|-------|--------|
| 1 | Of no use at all |
| 2 | Very useless |
| 3 | Of little use |
| 4 | Don't know |
| 5 | Of some use |
| 6 | Very useful |
| 7 | Essential |

The RG-UK was revised following the pre-panel comments (Appendix A, RG-UK α3) and integrated with the re-drafted PG-UK (Appendix B, PG-UK α2) for discussion during the meeting. The items were grouped according to agreement, but none were amended at this stage, as it was important for the expert panel to make the final decision on these.

We presented the panel with a summary of the focus group item ratings and the results of their pre-panel ratings at the meeting. We initiated a discussion on each group of items, the stem questions and the instructions for completion of the questionnaire. Items agreed as being useful social resources and those agreed as not being useful were set-aside after discussion. Items that could not be agreed upon were discussed at greater length to seek a consensus on their inclusion or exclusion. At this stage, some items were amended or new ones added. Following the item discussion, the panel members were asked to re-rate the items on a slightly amended scale (table 4.3).

**Table 4.3        Post-panel rating scale**

| Score | Rating |
|-------|--------|
| 1 | Very useless |
| 2 | Of little use |
| 3 | Don't know |
| 4 | Of some use |
| 5 | Very useful |

We had planned to invite more discussion and a final round of ratings if there was still disagreement about items. In the event, we had insufficient time and the consensus was achieved by a re-analysis of the final ratings.

The panel members were also asked to discuss the list of occupations for inclusion in the PG-UK. Consensus was achieved by discussion rather than using ratings, as these were much less contentious.

### 4.3.4.3   Analysis

We used a strict definition of agreement for the pre-panel ratings. This was defined as panel members all scoring within a 3-point range (table 4.4).

**Table 4.4        Definition of agreement (pre-panel rating)**

| | |
|---|---|
| **Agreed – useful social resource** | Score of 5-7 from all panel members |
| **Agreed – not a useful social resource** | Score of 1-3 from all panel members |
| **Agreed – equivocal about its use** | Score of 3-5 from all panel members |
| **No agreement** | Scores are dispersed through more than one of the above categories |

(Hunter et al., 1994; Scott and Black, 1991)

The second round of ratings took into account the influence of outliers if the distribution of scores for an item was skewed (table 4.5). The score furthest from the median was discarded to increase the likelihood of agreement and reduce the influence of one person's view blocking consensus. In the event of two scores being equidistant from the median, the score which increased the degree of consensus most was retained (Scott and Black, 1991).

**Table 4.5        Definition of agreement (post-panel rating)**

| | |
|---|---|
| **Agreed – useful social resource** | Score of 4-5 from all panel members after discarding the rating furthest from the median |
| **Agreed – not a useful social resource** | Score of 1-2 from all panel members after discarding the rating furthest from the median |
| **Agreed – equivocal about its use** | Score of 2-4 from all panel members after discarding the rating furthest from the median |
| **No agreement** | Scores are dispersed through more than one of the above categories after discarding the rating furthest from the median |

(Scott and Black, 1991)

For items where there was no agreement after two rounds, we accepted those with a mean rating of 3.0 or greater to establish consensus (Fink et al., 1984).

### 4.3.5    Cognitive appraisal

Self-complete questionnaires can provide misleading data if they are poorly written or if respondents misunderstand questions. For example, Mallinson (2002) found in her in-depth assessment of the widely used Short-Form 36 Health Status Questionnaire (Brazier et al., 1992) that its response options were insufficient and that it contained double questions, creating coding difficulties for researchers.

Cognitive testing helps us to analyse the way that respondents understand and answer survey questions (Collins, 2003). It focuses on the mental processes that respondents use to answer questions and helps the researcher to detect concealed as well as noticeable problems (Qureshi and Rowlands, 2004).

The theoretical underpinning of cognitive testing is most frequently attributed to Tourangeau's (1984) model. This identified four processes that are involved in answering survey questions: understanding the question, retrieving relevant information from memory, making a judgement about this information and formatting and editing the response. Cognitive interviewing is a method of eliciting these processes from respondents to minimise response error caused by question wording, question sequencing or questionnaire formatting. By observing respondents as they complete questionnaires and think-aloud their thoughts, the researcher can, by using additional probing questions, gain insight into respondents' understanding of questions and the reasons for their responses.

### 4.3.5.1    Sample

We adopted a maximum variation sampling strategy (Patton, 2002) for the recruitment of cognitive interviewees to ensure that the instruments were tested by a diversity of people. Although the sample was predominantly female (n=6, 75%) and white British (n=7, 87.5%), the major groups of the Standard Occupational Classification (Office for National Statistics, 2000) were represented.

The sample size was determined by the principle of theoretical saturation (Coyne, 1997). We continued the interviews until no new problems emerged with the questionnaires. In total, 8 people participated. The participants had either previously expressed an interest in attending a focus group, but were unable to, or were known to the researcher in another capacity. All the respondents expressed their views about the

instruments in an honest and forthright way. It did not appear that they were offering biased opinions due to having prior contact with the researcher.

### 4.3.5.2   Procedures

We asked the participants to complete RG-UK α4 (Appendix A) and PG-UK α3 (Appendix B) whilst reading the questions out loud. We also asked them to put their thoughts into words as they completed the questionnaire. Although this method can be demanding (Collins, 2003), it is the most effective means of assessing the respondent's understanding of the questions. As the RG-UK and PG-UK are relatively brief instruments, we did not feel that this method placed an undue burden on the respondents.

We used additional probing questions to elicit more information about respondents' understanding of the questionnaires. These were used particularly when respondents seemed uncertain about the meaning of questions or found them difficult to answer.

The interviews were tape-recorded for analysis.

### 4.3.5.3   Analysis

The analysis of the cognitive interviews was conducted as an iterative process. Following each interview, the tape recording was reviewed and amendments were made to the RG-UK and PG-UK as required.

### 4.3.6   Phase 1 piloting – item reduction and scaling

The phase 1 pilot was conducted to provide data for item analysis, item reduction and scaling for the RG-UK and PG-UK. Participants in the cognitive appraisal indicated to us that the PG-UK imposed quite a burden on respondents when used with other questionnaires. Therefore we aimed to assess which of the 30 occupations would not be required in the measure because of replication, missing data or floor or ceiling effects. We also aimed to use Mokken Scaling for Polytomous items (MSP) (Molenaar and Sijtsma, 2000) to explore the internal domains of both instruments.

### 4.3.6.1 PG-UK occupational prestige

Position generators operate on the basis that occupations have an inherent prestige through which resources can be accessed (Lin and Dumin, 1986). Occupational prestige is culturally and socially dependent and needs to be calculated for each new version of the Position Generator. The prestige scale (Appendix C, table C1) constructed to help us to select occupations was insufficient for this purpose, as it had little variability in prestige scores between the occupations with low and high prestige.

We used the Standard Occupational Classification (SOC) codes (Office for National Statistics, 2000) as the basis for our prestige scores. Each occupation had a four-digit code that corresponded to its place in the overall structure of occupations. Occupations in the highest major group (managers and senior officials) had a code beginning with '1'. Occupations in the next group (professional occupations) had a code beginning with '2' and so on until the final group (elementary occupations), which had codes beginning with '9'. Sub groups within the major groups were coded in a similar way, beginning with the occupations at the top of the hierarchy down to those considered to be at the bottom. Codes therefore ran from 1111 (senior officials in national government) to 9251 (shelf fillers) and 9259 (elementary sales occupations not otherwise categorised) (Office for National Statistics, 2000).

To calculate a prestige score for each occupation we subtracted its SOC code from 10,000 to list them in increasing order. We then multiplied them by their skill level (1-4) (Office for National Statistics, 2000) to emphasise the importance of training and experience to occupational prestige. To produce a manageable figure, we divided the total by 100 and rounded it to the nearest integer. For example, an artist is coded as 3411 in the SOC. Its prestige score is $(10,000-3411)\times 3/100=198$. This method produces a meaningful ranking of occupations from Member of Parliament (356) down to postal worker (8) and window cleaner (8) (Appendix C, table C3).

We made one amendment to the SOC codes to ensure our prestige scores made intuitive sense. Schoolteachers were given a lower SOC code than solicitors and judges and this translated into a higher prestige score when the above method was followed. However, as a higher degree of training, skill and ability is required of a solicitor or judge than a schoolteacher, the former should attract higher prestige scores. To account for this anomaly we gave solicitors and judges lower SOC codes for the

purpose of calculating their prestige scores (Appendix C, table C3, figures in parenthesis).

This method possibly distinguishes less between the minor groups than the major groups of the SOC. For example, there was very little difference between university professors (308) and schoolteachers (307) in prestige according to our scores, although it could be argued that the former are held in much higher regard than the latter. In contrast, there was a substantial difference between two high street occupations estate agents (194) and travel agents (76), which are arguably similar in occupational prestige.

### 4.3.6.2 Sample

We conducted item analysis using a method derived from item response theory (Sijtsma and Molenaar, 2002). A sample of at least 50 cases was required for this form of analysis. However, a minimum sample of about 200 was recommended for the analysis and scaling of a large item pool, such as we had in the RG-UK (Molenaar and Sijtsma, 2000). We therefore aimed to achieve a sample of at least 200 cases with responses to all items.

We did not have the resources to obtain a truly representative sample of the UK general population. However, we aimed to achieve a good response from a broad cross-section of UK society. To achieve this, we recruited from the same regions as the focus groups. In both these areas we purchased the edited electoral registers of four wards: Selhurst and Ashburton in the London Borough of Croydon and Armthorpe and Torne Valley in Doncaster Metropolitan Borough. The edited registers contained all those eligible to vote in May 2004 who had consented to have their name and address on the list available for purchase for research purposes.

The edited registers provided us with a sampling frame of 33,916 people, of whom 50.5% (n=17,126) were from Croydon. The edited registers contained 60.8% of the population of the two Croydon wards that was enumerated in the 2001 census (Office for National Statistics, 2003) and 49.6% of the local population of Armthorpe. It was not possible to calculate the equivalent figure for Torne Valley, as the electoral ward was created after the 2001 census. It was also not possible to discern how many of those not included on the edited register chose not to be on this register or on the main register.

From the electoral registers we selected a random sample of 1000 people, stratified by local authority, using SPSS 12.0 for Windows (SPSS Inc., 2003). The random sample was in proportion to the numbers on the edited electoral register for each ward (Appendix C, table C4).

We selected a sample of 1000 as we anticipated a response rate of 20-30% on the basis of similar general population self-complete postal questionnaires mailed to a random sample of people on the electoral register. For example, Thomas et al (2002) achieved a response rate of only 17% in south Manchester while Smith et al (1999) had responses from just over 40% in their Bristol study.

### 4.3.6.3    Response rate

We administered the RG-UK (Appendix A, RG-UK α5) and PG-UK (Appendix B, PG-UK α3) to the sample via a self-complete postal questionnaire. We mailed one reminder to non-responders. In the first wave we achieved a response of 194 completed questionnaires and a further 101 in the second wave, resulting in a total of 295 respondents.

A small number of questionnaires (n=11) were returned incomplete because the respondent had either moved away (n=10) or was deceased (n=1) since the edited register was published. It is likely that there were more ineligible participants amongst the non-responders, but it was impossible to determine how many. Therefore, the adjusted response rate of 29.8% is likely to be an underestimate of the actual response (Appendix C, table C5).

### 4.3.6.4    Non-response bias

We had very little information about non-responders to assess for non-response bias. We deduced the sex of non-responders by their first name on the edited register. This was possible for all except for six people (0.9%). The only other information we had available was the electoral ward of non-respondents.

Significantly more women completed the questionnaire than men ($\chi^2$=11.69, df=2, p<0.001), although the response did not vary according to electoral ward (Appendix C, table C6). It therefore appears that a sex self-selection bias has occurred within our sample.

Only seven (1.0%) non-participants gave a reason for their non-response. Two (0.3%) had recently suffered bereavement and five (0.7%) were unwell or disabled. It is possible that these people were unable to complete the questionnaire because they did not have anyone to assist them. It follows that they may have less access to social resources in general and our sample may over-estimate access to social resources in the source population.

### 4.3.6.5   Respondent demographics

Women were over-represented in the sample, particularly from the Croydon wards (62.1%vs.52.7%), but the average age of the sample was very similar to the local population (Appendix C, table C7). The sample was drawn from all ethnic groups approximately in proportion to the 2001 census in both local authorities and the marital status of the sample broadly reflected the local population in Doncaster and Croydon. However, people who were married or cohabiting were over-represented in the sample as a whole, and Doncaster in particular (68.4%vs.56.1%).

Respondents were asked to state their occupation and these were coded according to the SOC (Office for National Statistics, 2000). As table C8 (Appendix C) shows, the sample was drawn from all occupational groups, broadly in proportion to the local population. It was not possible to calculate $\chi^2$ for this cross tabulation because of the small numbers in some cells. However, it was apparent that people in the higher occupational groups were slightly over-represented in the sample, particularly in Doncaster. Retired people were also over-represented in Doncaster (23.2%vs.15.2%).

### 4.3.6.6   Analysis

The RG-UK was scored by summing the total number of resources the respondents had access to, irrespective of whom they may access them through. The resulting variable was measured at an ordinal level. While it would be accurate to conclude that a respondent with access to 24 resources had access to substantially more social capital than someone who can only access 12, it would be misleading to suggest that the former respondent has access to twice as much social capital because of the qualitative differences between the resources. Having access to an unusual resource such as someone with connections with the local media (item A13, RG-UK α5, Appendix A), for example, is quite different from knowing someone with a common resource such as owning a car (item A2, RG-UK α5, Appendix A). As traditional

psychometric analysis such as factor analysis assumes an interval level of measurement (Guilford, 1936), it is perhaps not the most appropriate method for item reduction and scaling. In contrast, item response theory models, which have been developed for variables measured at an ordinal or dichotomous level, appear to be the most sophisticated and full approach to detecting scales within the RG-UK.

Item response theory is increasingly being used in the development and validation of health outcome measures (Edelen and Reeve, 2007). Item response theory models assume that responses to questionnaire items are determined by latent traits, such as ability, personality or attitude (van der Linden and Hambleton, 1997). Here, we are interested in the internal domains of the RG-UK, which represent access to different sub-collections of social resources. These can be viewed as latent traits as they depend on an individual's ability to develop resourceful social contacts. These latent traits vary between individuals and can be quantified through questionnaire item responses, albeit with a degree of error.

Also, item response theory models assume that questionnaire items have a small number of response options (usually 2 to 5) (Sijtsma and Molenaar, 2002). This distinguishes it from factor analysis that, although also being a latent trait model, is only concerned with continuous variables. The response options to the RG-UK items are dichotomous. Individuals either have access to a resource (indicated by ticking 'yes' against it, subsequently coded as '1') or they do not (indicated by ticking 'no', coded as '0'). This coding schema follows van der Gaag and Snijders (2005) and does not violate basic assumptions in social capital theory that some resources are more usefully accessed through weak ties than strong ones (Granovetter, 1973; Lin, 2001).

Further, item response theory models assume that responses to questionnaire items are completely determined by the latent trait, together with random error, and not by any other variations that may be systematically observed between respondents. For the dichotomous items that make up the RG-UK, item response theory produces a better representation of internal scales and their associations than factor analysis. This is particularly true for items with very low or high endorsement frequencies, as their correlation coefficients on which factor analysis is based are not adequate indicators of their associations (van der Gaag and Snijders, 2004).

We used an exploratory non-parametric item response theory model, the 'Mokken scaling method' (Mokken, 1997; Sijtsma and Molenaar, 2002), for item reduction and

scaling. This method was used by van der Gaag and Snijders (2005) for cumulative scaling in the SSND and appears to be the most appropriate one for the RG-UK. Mokken scaling aims to find robust and one-dimensional scales within sets of items. It begins by taking pairs of items with the strongest associations and continues by gradually including other well-fitting items until a scale has been formed that does not improve any further when other items are added (Mokken, 1997).

Cumulative scale analyses are performed using MSP5 for Windows (Molenaar and Sijtsma, 2000). This uses Loevinger's $H$-coefficients (Loevinger, 1947) to express the fit of specific items within a scale and for the homogeneity of the scale as a whole. Uncorrelated items produce values of $H$=0, whereas perfectly homogenous scales produce values of $H$=1. Conventionally, scales with $H≥0.3$ are useful, $H≥0.4$ are medium strong and $H≥0.5$ are strong scales (Mokken, 1997).

The Mokken scaling method allows for each item to appear in only one scale. The procedure eliminates items that do not fit within any scale if their item homogeneity ($H_i$) falls below a set value, conventionally $H_i$=0.3 (Mokken, 1997). In our analysis we eliminated items if they fell below this value. Further, a reliability coefficient ($ρ$) is calculated for each scale. Values above 0.6 are conventionally taken as indications of sufficient reliability (Molenaar and Sijtsma, 2000).

Analysis of item endorsement frequencies and missing data was conducted using SPSS 12.0 for Windows (SPSS Inc., 2003) prior to scaling with MSP5 for Windows (Molenaar and Sijtsma, 2000).

### 4.3.7    Phase 2 piloting – test-retest reliability

We tested the reliability of the instruments using a test-retest methodology. Test-retest reliability refers to the ability of a questionnaire to produce the same result on two or more occasions, while it is assumed that the characteristic being studied remains unchanged. As access to social capital is a relatively stable trait, it is important that the results of the RG-UK and PG-UK also remain stable over time.

The time interval for test-retest reliability studies must be both long enough to exclude recollection effects and short enough to exclude changes in the trait being studied. For some instruments, this has been as short as one week (Davidson et al., 1997) or as long as ten months (van Agt et al., 1994) for example. A two week interval is suggested

to be appropriate for most research instruments (Streiner and Norman, 1995) and has been used in many test-retest reliability studies (e.g. Ramsay et al., 2000). We believe the construct measured by our instruments is stable for up to about 6 weeks because acquiring or losing access to resources is often a gradual process. Therefore, we selected a 2-3 week interval for our study as it was sufficiently long enough to eliminate recollection effects, but short enough to exclude changes in access in social capital.

### 4.3.7.1 Sample

We recruited a non-random sample of volunteers from the general population. Although this was potentially unrepresentative, it was sufficient to give an indication of the stability of the measure over time in this population.

We aimed to recruit a sample of 50 participants, as this has been suggested to be sufficient to demonstrate high reliability coefficients (Donner and Eliasziw, 1987) and has been used in other similar test-retest reliability studies (e.g. Ramsay et al., 2000). We aimed to reflect the main demographic features of the UK population in the sample and this guided our recruitment (Appendix C, table C9).

### 4.3.7.2 Respondent demographics

We achieved a sample of 47 participants that broadly reflected the demographic characteristics of the UK population, although women were over-represented (Appendix C, table C9).

### 4.3.7.3 Procedures

Participants were asked to self-complete the RG-UK and PG-UK. Two weeks later they were asked to complete the instruments again. Reminders were provided to participants who forgot to complete the questionnaires a second time to ensure there was not a significant time delay. 33 participants (70.2%) conducted the retest 2-3 weeks after the first completion. 9 (19.2%) participants took 3-5 weeks and 5 (10.6%) took over 5 weeks.

### 4.3.7.4 Analysis

To measure item test-retest reliability we calculated the kappa coefficient (Cohen, 1960) for each of the items in the RG-UK and PG-UK. The criteria we used to evaluate these coefficients were adapted from Landis and Koch (1977) and have been used in the evaluation of a number of psychiatric rating scales (e.g. Silverman et al., 2001): >0.74 indicates excellent reliability; between 0.59 and 0.74 indicates good reliability; between 0.40 and 0.58 indicates fair reliability; and <0.40 indicates poor reliability.

For each of the sub-scales of the RG-UK and PG-UK we calculated their intra-class correlation coefficients (Bartko, 1966) to measure agreement between the two time points, as there are well-documented limitations in using inter-class correlations such as Pearson's (e.g. Bland and Altman, 1996; Yen and Lo, 2002). We used the same criteria as above to evaluate the coefficients.

Excluding those who took longer than 2-3 weeks to complete the questionnaires the second time slightly reduced the kappa values due to a loss of power. As we expected access to social capital to be a fairly stable phenomenon for up to 6 weeks, we included all the participants in the analysis to increase the power of the study. The analysis was conducted in STATA v.9 (StataCorp, 2006).

### 4.3.8 Phase 2 piloting – validity testing and establishing population norms

The traditional assessment of criterion validity against a 'gold standard' measure of social capital was not possible, as such an instrument does not exist. Instead, we assessed the convergent and divergent validity of the RG-UK against the PG-UK and a measure of locus of control (Coleman and DeLeire, 2003) respectively. We expected the RG-UK to be more closely correlated with the PG-UK, which measures a similar construct, than with locus of control, which evaluates individual beliefs about internal or external control over events (Rotter, 1972). Locus of control was chosen due to its long association with mental health (Levenson, 1973) and because it helps us to explain why social support can act as a buffer against the development of depression (Dalgard et al., 1995).

We aimed to use data from this validity test to attain normative general population data for the RG-UK and PG-UK and perform sub-group analysis across the sub-domains of the two instruments. Also, by administering the self-complete 12 item General Health

Questionnaire (Goldberg and Williams, 1988), we aimed to explore how access to social resources and occupational prestige may vary according to the likely presence of a common mental disorder within a general population sample.

We adopted the same methodology as we used in the first piloting phase, as it was the most efficient way of generating a sufficient sample. However, as we aimed to maximise the response rate and minimise the potential for response bias, we gave non-responders more opportunities to take part.

From the electoral registers used in the phase 1 pilot we selected a new random sample of 1000 people, stratified by local authority, using SPSS 12.0 for Windows (SPSS Inc., 2003). As in the first pilot, the random sample was in proportion to the numbers on the edited electoral register for each ward (Appendix C, table C10).

### 4.3.8.1   Response rate

220 of the 1000 self-complete questionnaires (Appendix A, RG-UK β & Appendix B, PG-UK β) were returned from the first mailing and 99 from a subsequent mailing to all non-responders. We undertook a third mailing to non-respondents from the two Croydon wards, as the response rate in Croydon was only 28.0% at this stage in contrast to 35.8% from Doncaster. A third mailing was justified as written reminders are associated with higher response rates (Asch et al., 1997) and this was the most efficient means of minimising non-response bias. However, we only achieved an additional 16 responses from this mailing, bringing the total to 335.

As in the first pilot, a small number of questionnaires (n=15) were returned incomplete because the respondent was either under 16 (n=1), deceased (n=9), or had moved away (n=5) since the edited register was published. The adjusted response rate, taking into account those known to be ineligible for the survey, was 34.0% (Appendix C, table C11). This was an improvement on the first pilot.

### 4.3.8.2   Non-response bias

A disadvantage of using the electoral roll as a sampling frame is that little is known about non-respondents. As in the first pilot, the only information we had was sex and electoral ward. We deduced sex by first name for all but seven (1.1%) of the non-responders. Significantly more women completed the questionnaire than men

($\chi^2$=11.00, df=2, p<0.01) and it appeared that a sex self-selection bias occurred within our sample again (Appendix C, table C12). Also, significantly fewer people from Selhurst completed the questionnaire than the other 3 wards ($\chi^2$=9.50, df=3, p<0.05). Its adjusted response rate of 26.3% was about 10% less than the other 3 wards.

The Acorn profile (CACI Ltd, 2006) for Selhurst indicated that the ward was characterised by people who were 'white collar singles/sharers', in the category of 'comfortably off, starting off'. This profile had higher than average educational qualifications and more than average work full-time. It is possible, therefore, that non-respondents were too busy to complete the questionnaire. As we would expect people in employment to have access to more social resources, it is possible that we have under-estimated access to social capital in this pilot.

Eight (1.2%) non-responders gave a reason for their non-response. Six (0.9%) were unwell, one (0.2%) had recently suffered bereavement and only one (0.2%) was unable to complete the questionnaire because of a literacy problem or a disability. As in the first pilot, it is possible that these people were unable to complete the questionnaire because they did not have anyone to assist them. It follows that they may have less access to social resources in general and our sample may over-estimate access to social resources in the source population. However, it is impossible to know whether or not this group balances out non-responders who were too busy to complete the questionnaire.

### 4.3.8.3   Respondent demographics

Women were over-represented in the sample (Appendix C, table C13), but only by about 5% more than in the general population (Office for National Statistics, 2003). The sample was slightly older than the general population in the two areas, but it was drawn from all ethnic groups approximately in proportion to the 2001 census in both local authorities (Appendix C, table C13). Single people were under-represented, particularly in Croydon (20.5% vs. 35.6%). The under-representation of young single people in our sample matched the profile of non-responders as discussed above (section 4.3.8.2).

We achieved a cross-section of the general population in terms of occupational grouping (Appendix C, table C14). However, people from the lowest occupational groups were under-represented in both local authorities, although some of the respondents who did not state their occupation (9.0%) may fall into these categories.

Further, managers, senior officials and professionals were under-represented in Croydon. This may also be accounted for by those who didn't state their occupation or by the lower response from young single people. Although we cannot state that our sample was truly representative, we can be confident that it encompassed a broad range of the general population in terms of sex, age, ethnicity, marital status and occupational group.

### 4.3.8.4    Analysis

To understand how the changes we made following the first pilot affected the operation of the RG-UK, we performed a missing data univariate and multivariate analysis. Firstly, we inspected the histograms of the RG-UK scale and its sub-scales to evaluate whether they were normally distributed. We also inspected box plots, PP and QQ plots to confirm this. As the scales were not substantially skewed, we used $t$-tests, one-way analysis of variance (with Bonferroni correction to allow for multiple comparisons) and Pearson's correlation coefficients to explore associations between socio-demographic variables and RG-UK scale scores in this general population sample. We also tested for associations between common mental disorder and RG-UK scale scores using the GHQ-12 (Goldberg and Williams, 1988). Finally we performed an exploratory linear regression analysis using the stepwise forward selection method to develop a multivariate explanatory model for each scale. We used the Huber-White estimator of variance (Huber, 1967; White, 1980), which gives more accurate assessments of sample variability, to account for a slight negative skew in the scales. This analysis was repeated for the PG-UK scales. Analysis was conducted in STATA v.9 (StataCorp, 2006).

### 4.3.9    Phase 2 piloting – known group validity

As a further test of the validity of the RG-UK and the PG-UK we conducted a known-group validity test. This assesses the performance of a measure in a population known to be deficient in or have abundance of the construct in question. It is frequently used in the validation of health measures in the absence of a 'gold standard' criterion to compare it with (Hays et al., 1993; Stewart et al., 1992). For example, it has been used to validate measures for concepts as diverse as quality of life of Alzheimer's sufferers (Thorgrimsen et al., 2003), parent-child joint activity (Chandani et al., 1999) and risk of spousal assault in offenders (Kropp and Hart, 2000).

There is good evidence to suggest that higher educational attainment is positively correlated with access to social capital (Erickson, 1996; Lin and Dumin, 1986). Therefore we felt confident in selecting a group of academics as a 'known group' of people who will score higher on the RG-UK and PG-UK, as they were likely to have access to more social capital than the general population.

### 4.3.9.1  Sample

We asked 100 academics from the Institute of Psychiatry, King's College London, to complete the RG-UK and PG-UK. The inclusion criteria for the sample was possession of a PhD and an academic contract with the Institute of Psychiatry. A quarter (n=25) of the sample were of professor status. The non-random sample was selected from the register of staff in September 2004. All eligible participants were mailed β versions of the questionnaires and an internal mail response envelope was provided.

### 4.3.9.2  Response rate

We achieved a 65% (n=65) response rate with one mailing. We did not pursue non-responders with reminder mailings as the response was sufficient to demonstrate an effect in the validity test. Professors responded at a similar rate to the other academics (68%, n=17).

### 4.3.9.3  Respondent demographics

35 (53.85%) of the sample were men and six (9.23%) were of non-white ethnicity. 43 (66.15%) were of senior lecturer status or above. The mean age of the sample was 43.98 years (95%CI=41.54-46.43). The general population sample was 5.06 (95%CI=0.91-9.20) years older than the academics (t(368)=2.40, p=0017). Apart from employment status, this was the only significant difference between the samples.

### 4.3.9.4  Analysis

We calculated the difference between the scale means for the RG-UK and PG-UK between the sample of academics and the general population sample using *t*-tests. This procedure was repeated for the sub-scales. We controlled for the difference in age between the academic and general population samples using linear regression. The analysis was conducted in STATA v.9 (StataCorp, 2006).

## 4.4 Results

### 4.4.1 Focus groups

We encountered few difficulties in obtaining the views of the group participants about the instruments. They were also very forthcoming with their experiences of accessing social capital. A total of 7,454 paragraphs of text, each representing an individual's separate contribution to the group discussion, were produced from the groups for analysis.

#### 4.4.1.1 Asking for resources / reciprocity

The focus group participants said that they most frequently ask family and friends for help, advice or support if it were needed. The participants often approached their immediate family first, corresponding with Jacobson's (1987) 'family first rule', but only if they were able to help. For example:

*"I think I'd go to my mum and dad first and then, sort of, it would be guided by what I'm after."* (Male 7, aged <30, Doncaster)

*"I would go to different members* [of my family] *for different things. I wouldn't go and ask my brother to baby-sit, but I'd ask my sister. … I necessarily wouldn't ask any of my immediate family on relationship questions, on intimate stuff like that, but I would go to extended family, like my sister in law or something for those sorts of things. So I think it depends on what you want for who you go to."* (Female 2, aged 30-60, London)

Although family members were often preferred, some expressed a concern about over-burdening them. One participant, for example, was unable to reciprocate her aunt's offer of hairdressing, as she did not want to accept a payment:

*" … I've got an auntie who's a hairdresser but I'd never gone to her, well, I went to her to have my haircut a few times and she never charged me for it. So now I've stopped going there because I felt like I was taking advantage, even though she offers to do it."* (Female 10, aged <30, Doncaster)

There were mixed opinions about whether or not participants would ask friends for a professional service. While some would do it and offer a payment, others preferred to pay someone they didn't know.

> *"If you did know a carpet fitter who was doing that for a profession and he was your friend, for example, would you have difficulties in going to ask him for a favour to do that?* (Researcher)
>
> *No, but I'd probably offer to pay him, all the same. I wouldn't just say 'will you do this?' just because you're my friend. I'd probably offer to pay him, hopefully get mates rates and stuff.* (Male 5, aged <30, Doncaster)
>
> *… I have a problem asking a friend to do that sort of task. Experience has taught me that if the friend makes a mistake, you've no comeback.* [There was some agreement in the group on this point] *… I'd rather pay the going rate and have somebody I didn't know, and I'd feel much more in control."* (Female 14, aged 30-60, Doncaster)

However, it was common for the participants to obtain resources via friends, although not necessarily directly from them. For example:

> *"… I've often had to find the name of a good person who could repair my boiler, or a good garage from a friend …  I've benefited a lot from seeing an osteopath via a friend of mine."* (Female 1, aged 30-60, London)

Reciprocity was a common underlying theme in the focus group discourses. In close relationships where the exchange of resources was routine and reciprocal, participants felt at ease with accessing their social capital. On the other hand, in situations where it was not possible to reciprocate offers of resources, participants felt uncomfortable to ask for them.  In particular informal resource structures are open to abuse from people outside of one's social network who have no intention of reciprocating. The following quotes illustrate this:

> *"If I wanted my car fixed, I'd go to a garage, whose owner happens to be a friend of mine … I've known them for 25 years. They come down and they come to my home, I go to theirs, we go away together, things like that. And therefore they do me, you know, a fair job and what have you."* (Male 2, aged >60, London)

*"I happen to be going to Jamaica with a friend who has some other house there. So, but it made me feel bad doing it because it looks as though I sort of went after people saying, "Oh, you've got to have someone to go and stay in it". You know. I felt a bit funny about that. It seems to me as if I was using someone very instrumentally, I think."* (Female 1, aged 30-60, London)

*"My family sell furniture and sometimes people come to us and expect maybe a bit more than mates rates and then look offended when we say that we're running a business and you don't want to not, you have to actually cover your costs."* (Male 7, aged <30, Doncaster)

In general, the participants preferred not to ask for resources from acquaintances, but some would approach colleagues on specific matters related to work.

### 4.4.1.2   Definitions

We enquired about the definitions of network ties used in α1 versions (Appendices A&B) to ensure that they were appropriate. The definition of friend as 'someone outside your family whom you could visit uninvited' provoked the most discussion. Some took the definition literally and found the notion of visiting their friends uninvited unhelpful. This was perhaps a generational phenomenon as the older participants said that they would not hesitate to drop in on friends uninvited.

*"I've got friends that are like really, really busy and you'll never catch them in, so you could turn up about 12 times before they'd actually be there. So you are always going to phone them as it's usually a waste of time otherwise."* (Female 10, aged <30, Doncaster)

*"I wouldn't just go to someone's house and … I'd ring my best friend in Leeds and say, look, I'm going to come and want to go out, I wouldn't just turn up. And she's my best friend, my bridesmaid, my baby's godmother. I just, look, wouldn't."* (Female 9, aged 30-60, Doncaster)

*"I've got lots of people, friends and acquaintances who I never feel inhibited about going and knocking on the door, calling on them."* (Male 2, aged >60, London)

Some of the participants had difficulties in categorising the people they knew. A divorced spouse and a non-resident boyfriend proved difficult to categorise, for example. Another was unsure about the boundary between friends and acquaintances:

*"… I know somebody quite well at church who is a scientist, but I don't feel that, but* [he] *is not a personal friend of mine. But if I had a problem, I know* [he] *would want me to, I'd just pick up the phone, and ask him things about this query. But I would be uncomfortable to drop around to Chris' house. I mean, that would be fine, but I really don't have that kind of personal relationship with him* (Female 4, aged 30-60, London)
*Would he come in under the category of 'acquaintance'?* (Researcher)
*No, I think he's more than that …"* (Female 4, aged 30-60, London)

Friends or relatives of friends who were known personally to the participants also proved difficult to classify. For example:

*"One thing I noticed with friends is you could have different levels of friends and I know that, like in French, 'amie' is like a really close friend and 'copaine' is like a wider circle of friends. I think that could be quite useful because I've got, like I'm thinking of my friend […], who's a close friend's husband and it's like, well, he, I could have called him, he's in my wider circle of friends. So, yes, maybe, in the friends column …"* (Female 3, aged <30, London)

In contrast, the definitions of wider and immediate family did not prove as contentious. The only exception was the categorisation of cousins. Most participants were not close to their cousins and were unsure if they should be categorised under 'wider family' as it assumes that the tie was stronger than friends.

*" … you don't see your cousins very much, so they're not really as important as your friends."* (Male 7, aged <30, Doncaster)

*" … And not only that, but they're not as accessible. You know, if you've got a cousin that lives in Cornwall or somewhere, then you're not going to ask them for favours or help."* (Male 5, aged <30, Doncaster)

Although the definition of an acquaintance was relatively unproblematic, a number of participants suggested that colleagues should have a category of their own. For example:

*"When you are in full-time work you see people more often almost than you see your own family. So you do build strong relationships and yet sometimes become friendships but sometimes they don't. But they feel close, something other than acquaintances."* (Female 1, aged 30-60, London)

*" … that for me was exactly what an acquaintance is. I mean you could say 'alright' to them as you walk past them, but you don't know the ins and outs of their lives."* (Male 7, aged <30, Doncaster)

### 4.4.1.3  Stem questions

Prior to discussing the individual items, we explored the participants' understanding of the stem questions. Two people with English as a foreign language had some difficulties in understanding the stem question and one suggested that further instructions might be helpful. In general, though, the participants could understand what to do, even if they had to read it through a couple of times.

The RG-UK (version α1, Appendix A) asked respondents to indicate the person closest to them from whom they could obtain the resources. There was some discussion about how the categories were ordered, although it was up to the discretion of the respondent which category to tick. For example:

*" … I wouldn't necessarily put wider family as closer than friends* [there was some agreement with this]. *In a lot of cases, obviously, probably half your wider family is closer than half your friends, but that's definitely a grey area."* (Male 5, aged <30, Doncaster)

The majority of participants followed the instructions correctly and placed one tick for each item in one of the first five columns. However, there were a number of completion errors, particularly with question one. Almost one half (n=10, 45.5%) did not complete at least one item on question one. Half of these (n=5, 22.7%) also did not complete at least one item on question two.

An additional four participants (18.2%) did not complete at least one item but ticked the 'you?' column consistently instead. This suggests that they mistakenly interpreted the question to mean that if they possessed the skill or resource then they did not have to indicate whom they might approach if they needed to ask someone else for it. Others, however, only ticked the 'you?' column if they possessed the skill but no one else they knew did. For example:

*"With the column headed 'you', in part b, how did you do that?* (Researcher)
*… I only ticked that very rarely, as I went mainly for my immediate family. So if I have the same skill, I haven't ticked me as well."* (Female 14, aged 30-60, Doncaster)

Two participants ticked more than one relationship category for at least one item in both the RG-UK and PG-UK. This suggests either a misreading of the question, that the participants could not decide who to classify as the person closest to them or that they would approach both people to access their skill or resource (for the RG-UK).

Finally, two participants ticked 'no' in addition to a relationship category. This may be a fault in the questionnaire design or it is possible that the participants did not fully understand how to complete the instrument.

### 4.4.1.4   RG-UK items

The debate about the items was coded into passages of text where the discussion was predominantly in favour of the item (relevant) or against it (irrelevant). Additional discussion about the items, often to clarify their meaning or suggest alterations, was coded separately. This coding is summarised in table C15 (Appendix C). We used this data to perform a comparative analysis with the participants' individual ratings that are presented in table C16 (Appendix C).

We separated the items into three broad groups, using the criteria in table 4.6, to distinguish between those that are broadly of relevance, those that are not and those where opinions were divided. The results of this are presented in table 4.7.

**Table 4.6          Criteria for grouping items**

| | |
|---|---|
| **Relevant** | Has a median of 3 or over on the rating scale and a greater number of passages suggesting that it is relevant than irrelevant |
| **Irrelevant** | Has a median of 3 or less on the rating scale and a greater number of passages suggesting that it is irrelevant than relevant |
| **Mixed opinions** | Items that do not fall into the above two categories |

Table 4.7 forms a rather crude summary of the focus group discourses. In particular, there was considerable discussion of some items that were seen as either relevant (e.g. item 1.14) or irrelevant (e.g. item 1.19), and little discussion about others where opinions were divided (e.g. item 1.2). Also, two items (1.1 and 1.14) in the 'relevant' group had bi-modal distributions where there were peaks at either end of the rating scale, suggesting that there were also a large number of individuals who thought the items were irrelevant. However, this summary does provide a framework for understanding the group discussion of the items.

Of the items that were generally viewed as being relevant, item 1.14 ('earns more than £1,500 monthly') stimulated the most discussion. Two themes emerged from the discussions. Firstly, some participants questioned having a figure of £1,500 income a month and preferred to leave it up to the respondent to decide on what constitutes a high salary. Others, however, found the figure a useful benchmark. For example:

*"… basically depending on which social group or which, where people's circumstances are, it's going to vary. Like, one thousand five hundred might be a lot to some people but not very much to others, so, then you can just say 'higher' then that takes into account their circumstances…"* (Female 3, aged <30, London)

*"… when you have a thousand five hundred stated there as a monthly income, wouldn't that be synonymous with the earnings of a graduate, the earnings of a middle management. Therefore a position of knowledge, authority etc, and therefore should you be need to seek advice you would go to them by virtue of the fact that you, sort of, you equate the salary with the position that they hold in society. Therefore a figure might be useful."* (Male 1, aged >60, London)

**Table 4.7        Summary of focus group opinions on RG-UK α1 items**

| Relevant items | Irrelevant items | Mixed opinions |
|---|---|---|
| 1.1 …can repair a car, bike, etc. | 1.6 …can play an instrument | 1.2 …owns a car |
| 1.3 …is handy repairing household equipment | 1.7 …has knowledge of literature | 1.4 …can speak and write a foreign language |
| 1.5 …can work with a PC | 1.8 …has A levels | 1.9 …has a higher vocational training |
| 1.14 …earns more than £1,500 monthly | 1.10 …reads a professional journal | 1.18 …has good contacts with a newspaper, radio or t.v. station |
| 1.15 …owns a holiday home abroad | 1.11 …is active in a political party | |
| 1.16 …can sometimes hire people | 1.12 …owns shares worth at least £3,000 | |
| 1.17 …knows a lot about governmental regulations | 1.13 …works at the town hall | |
| 1.20 …has knowledge about financial matters (e.g. taxes, subsidies) | 1.19 …knows about soccer | |
| 2.2 … could give advice on conflicts at work | 2.1 … could find a holiday job for a family member | |
| 2.3 … could help when moving house (packing, lifting) | 2.7 … could lend you a large sum of money (e.g. £3,000) | |
| 2.4 … could help with small jobs around the house (carpentry, painting) | 2.10 … could discuss with you what political party to vote for | |
| 2.5 … could do your shopping when you (and your household members) are ill | 2.13 … could baby-sit your children | |
| 2.6 … could give a medical second opinion | | |
| 2.8 … could provide a place to stay for a week if you have to leave your home temporarily | | |
| 2.9 … could give advice about conflicts with family members | | |
| 2.11 … could give advice on matters of law (e.g. problems with the landlord, boss, municipality) | | |
| 2.12 … could give a good reference when applying for a job | | |
| 2.14 … could discuss important matters with you | | |
| 2.15 … you could visit socially | | |

Secondly, there was a debate about the meaning of the item and the reason for its inclusion in the questionnaire. Some thought that it referred to the possibility of approaching people who earned more than £1,500 a month to borrow money from

them. However, this was questioned, as it did not necessarily mean that high earners had money available to lend or that they would be willing to lend it if they did:

*"In my working life I've known a lot of millionaires and they're the most tight fisted sods I have ever come across. Because they only want the money they wouldn't be any good to ask to borrow it from them."* (Male 6, aged >60, Doncaster)

*"When you take it home you could spend it* [all] *… it would depend on people's priorities, wouldn't it? There's the old saying in Yorkshire 'all fur coat and no knickers'* [laughter]. *BMW on drive and no food in the fridge, you know. It depends what people want."* (Male 6, aged >60, Doncaster)

Two further items quoting sums of money (1.12 and 2.7) also proved contentious. For example, having a cut-off of £3,000 worth of shares (item 1.12) initiated a heated discussion in one of the London groups about whether de-nationalisation of the utilities has popularised share ownership. One side of the argument was that this figure provided a realistic cut-off for people who owned a considerable amount of shares. Others thought that such a figure was meaningless.

Two other items that participants thought were generally relevant, but a little ambivalent, were asking for a medical second opinion (item 2.6) and advice on matters of law (item 2.11). In both cases, the participants questioned how appropriate it was to seek medical or legal advice from a network member rather than to see someone in a professional capacity. A solicitor or doctor may not be willing to give unofficial or 'friendly' advice, as it may not be covered by professional indemnity insurance. They may also not be qualified to give advice in the specialist area requested. Some felt that it was better to know such a person than not, though others wouldn't go to a network member for such advice.

The focus group participants felt that some of the more relevant items were a little vague. For example, item 1.1 asks two questions and should be made more specific. Items 2.14 and 2.15 were also seen as rather ambiguous.

*"… I ticked it* [item 1.1] *because I know that I could have somebody at the moment who could help me fix a bike, but not a car. So what would I do, as it's more likely that somebody would have to help me to fix a car than a bike?"* (Female 11, aged <30, Doncaster)

*"… If you needed to ask someone if you could visit them socially,* [laughter] *could you visit them socially? If I'm going to visit someone socially, you know, I'd not have any plans, I'd just turn up and feel welcome."* (Male 5, aged <30, Doncaster)

Of the more irrelevant items, 1.19 stimulated the most discussion. Many questioned its inclusion on the questionnaire and the selection of soccer above other sports. Even the participants who were interested in the sport did not necessarily consider it useful to know another person with the interest.

*"… it makes no difference to my life whatsoever* [laughter]. *In fact, it is more adverse affect on my life because the hooligans park in front of my house…"* (Male 1, aged >60, London)

*"Well, soccer is very … it just seems to be a male orientated question. You mustn't forget the females as well. We're always getting left out."* (Female 12, aged 30-60, Doncaster)

It seemed that the only scenario in which it would be useful is if:

*"… you're sat opposite Chris Tarrant."* (Female 9, aged 30-60, Doncaster)

Of the two items about academic and vocational qualifications (1.8 and 1.9), having a higher vocational training was viewed as being more relevant than 'A' levels. However, both were viewed as rather arbitrary and ambiguous. The participants did not generally hold 'A' levels in a high regard and they suggested replacing this with a degree. Some participants understood 'higher vocational training' as referring to a religious vocation, while others found it irrelevant because they do not understand the current system of vocational training:

*"… I think the average person when you turn round and say to them 'vocational training', they don't, they don't use that expression … I don't know what the hell is NVQ."* (Male 2, aged >60, London)

For the items where the groups were generally ambivalent about their relevance to the RG-UK, there were no particularly strong opinions either in favour or against them. For example, knowing someone with a car (item 1.2) was relevant for those without one, but was not so important for car owners. Knowing someone with a foreign language

(item 1.4) was useful for participants who travelled or had documents to translate, but it was generally not viewed as important as it would be in The Netherlands.

Finally, the participants were asked to suggest new items for the RG-UK (Appendix C, table C17). Many participants suggested that knowing reliable trades people was important to them and that this was missing from the RG-UK prototype. One participant (male 6, aged >60, Doncaster) encapsulated the idea of social capital in his suggestion that it would be useful to know someone with time to volunteer his or her skills in a labour exchange scheme such as a time bank. This suggestion implies having a reciprocal arrangement, which is key to accessing and exchanging resources. Other suggestions were for particular resources that individual participants would find useful to have access to, for example child psychology, alternative medicine or a teacher. It is possible that they would be of some relevance to the wider UK population and some were put forward to the expert panel for their deliberation.

### 4.4.1.5  Amendments to RG-UK

We re-drafted RG-UK α1 prior to its scrutiny by the expert panel to take into account the focus groups' concerns about the stem questions, the definitions of network ties and the wording of a number of items. The most significant alteration we made was to drop the relationship categories, which were problematic for the focus group participants, and replace them with a 10 cm scale for respondents to indicate how close they felt to the person that possessed the skill or resource. This scale has been used in a study of health satisfaction (Wright, 1985), for example. This method appeared to be a more accurate way of recording the strength of relationships and does not assume that family is closer than friends, for example.

To resolve the difficulty relating to whether or not the respondent possessed the skill or resource him or herself, we separated this question from the main set (Appendix A, RG-UK α2). We also ensured that the instrument was designed as clearly as possible to minimise completion errors. We included substantial instructions for its completion on the first page that were as clear and unambiguous as possible. These retained examples of relationships (e.g. family, friends, acquaintances) to guide the respondent where to put their mark on the line, while enabling them to indicate exactly how close they felt to each individual with the skill or resource.

We kept 30 out of the 35 items from RG-UK α1, although we changed the wording of all but four (Appendix C, table C18). These changes either clarified the meaning of the items or changed their meaning according to the focus group discussions. It was also anticipated that these changes would reduce some of the missing data that arose when the focus group participants had completed the instrument, particularly in question one (Appendix C, tables C19&C20).

Although a substantial number of the items were largely irrelevant to the focus group participants (table 4.7), we discarded very few of them to allow the expert panel to give their opinions on them. In fact, only two of the five items we discarded were seen as largely irrelevant ('knows about soccer' & 'could find a holiday job for a family member'). The other discarded items were too ambiguous ('has a higher vocational training'), largely repeated by other items ('could give advice about conflicts with family members') or not very relevant in the UK ('could provide a place to stay for a week if you had to leave your home temporarily'). The expert panel was presented with both α1 and α2 RG-UK versions so that they could reverse these decisions if they chose. We included eight new items in RG-UK α2 (Appendix C, table C18). These were either suggested by the focus group discussions or arose in supervision discussions.

### 4.4.1.6 PG-UK items

We asked the focus groups to comment on the occupations listed in PG-UK α1 (Appendix B). Firstly, we asked if there were any occupations that they were unfamiliar with or unsure about, or they felt were too obscure for inclusion in the measure. 21 (61.8%) occupations were mentioned, 11 (32.4%) more than once (Appendix C, table C21).

The majority of discussion was about occupations that the participants thought were obscure or irrelevant for the majority of the UK population. For example, 'fishmonger' and 'countryside warden' were considered to be quite irrelevant by each group:

> "*Fishmonger* [laughter]. *I was just thinking that was kind of archaic almost, that thing.*" (Female 3, aged <30, London)

Next there were occupations that were very general, poorly defined or could be understood differently by different people. For example, the participants felt that

'community worker' was very broad and could cover a number of different occupations. Also, 'market trader' could mean different things to different people:

*"I see you've given the occupation of a market trader. Now, that to me, that has two different definitions, again. Market trader in terms of the city and that is a general thing called a market trader, right.* [Various people agree with this]. *Or you have somebody who works in the market stall, right. Now, they are two distinctly different groups and I think you need to address it."* (Male 2, aged >60, London)

The participants were astute in identifying occupations that would provide access to only a little social capital. For example, one participant said that a taxi driver is rather irrelevant as you only say 'hello' and 'goodbye' to them. Another suggested omitting the security guard:

*"Is that one you would cross off then as not worth knowing?* (Researcher)
*Unless you're going to rob the place that he guards* [laughter] *then maybe …"*
(Male 4, aged <30, Doncaster)

Finally, we asked the participants to suggest new occupations to replace those that they would omit. 25 new occupations were suggested, five of which were mentioned more than once (Appendix C, table C22). For example, police officer was a suggested replacement for security guard and butcher should be included to replace fishmonger.

### 4.4.1.7  Amendments to PG-UK

Following analysis of the focus group data we kept 16 of the occupations unchanged for the PG-UK (Appendix C, table C23). We altered eight to clarify their meaning (e.g. administrator was changed to secretary) or amended to a similar, but more recognisable, occupation (e.g. countryside warden was changed to farmer). The remaining ten occupations were discarded as they were either not easily recognised by the participants or duplicated items in the RG-UK. All the occupations that arose in discussion more than once (Appendix C, table C21) were either amended or discarded.

We added eight new occupations to the PG-UK that brought the total number up to 32. These new additions were drawn from suggestions made by the participants (Appendix C, table C22). They were chosen according to their position within the SOC (Office for

National Statistics, 2000) to ensure that an adequate cross-section of occupations were represented following the amendments and deletions. For example, solicitor (professional occupation SOC2) and nurse (associate professional occupation SOC3) replaced academic researcher and laboratory technician respectively. We were not able to include all the participants' suggestions, as we wanted to maintain the feasibility of the instrument for self-completion.

## 4.4.2    Expert panel

### 4.4.2.1    RG-UK

There was no agreement for the majority of items in the pre-panel ratings (table 4.8). However, there was agreement that twelve of the 38 items were useful social resources.

**Table 4.8        Pre-panel ratings summary**

| Categories | Agreed – not a useful resource | Agreed – equivocal about its use | Agreed – useful resource | No agreement |
|---|---|---|---|---|
| **Items (RG-UK α2)** | | A12, A18, A21 | A1, A2, A11, A16, A17, A19, B4, B5, B6, B9, B12, B14 | A3, A4, A5, A6, A7, A8, A9, A10, A13, A14, A15, A20, A22, B1, B2, B3, B7, B8, B10, B11, B13, B15, B16 |

Prior to a detailed discussion of the items, the panel members gave their comments on the structure of the questionnaire and the stem questions. Several themes emerged in this discussion that informed the further development of the instrument.

Firstly, the panel highlighted the potential difficulties that respondents may face when considering who they might ask for each skill or resource. Would it be just the person who is closest to him or her, or could they list more than one if they would approach more than one person? Although no agreement was reached on this, a consensus did emerge that it was important to re-introduce the relationship categories, as it was more useful to know who was providing the resource rather than how close they were to the respondent. The definitions that accompanied these that the focus group members found problematic were subsequently omitted to allow respondents to define them for themselves.

Secondly, panel members were concerned that social class could bias responses to the RG-UK. For example, playing a musical instrument (item A6, RG-UK α3, Appendix A) and having a good knowledge of literature (item A7, RG-UK α3, Appendix A) were likely to have a middle class bias. It was considered important to include items that were equally as relevant to people of lower socio-economic status so that the questionnaire responses did not merely replicate social class. This could be, for example, having knowledge of someone who could obtain cheap goods.

Similarly, the instrument had to be relevant for all adults, whether of working age or retired, and all ethnic groups. The panel discussed at length whether there should be one questionnaire that could be applied to the whole general population or a briefer set of questions that had additional items for population sub groups. The former approach was preferred as it would be easier to administer and will allow comparisons across the general population as a whole, although some items may not be applicable to all respondents. The panel suggested that it would be important to examine the field test responses for missing data and amend items as necessary.

The group discussed other definitions of social capital and questioned whether or not the RG-UK was measuring the same concept. It was not able to measure the quality of social relationships, the trust or reciprocity that is inherent within them or the mutual benefit that can be obtained from them. It also did not measure individual access to communal resources, which is the focus of the communitarian definitions of social capital. However, the instrument did measure access to social resources through personal networks that implied a degree of trust and reciprocity. As the stem question specifically asked if the skill or resource could be obtained within one week, it implied access was more or less instantaneous. This requires relationships that were characterised by a degree of trust and reciprocity so that the help could be obtained without hesitation.

Reciprocity has a long-term dimension in the exchange of social resources. Older people may request more resources than they could offer, for example. Reciprocity can be measured across a whole lifetime but it can be difficult to ascertain the degree to which this influences specific requests for skills or resources.

A panel member raised the question of the relevance of the RG-UK in a market economy where the skills or resources it contains could be obtained by anyone who could afford to purchase them. However, after some discussion, the panel agreed that

accessing the skills and resources listed in the instrument via personal networks rather than in a professional capacity could have quite different outcomes. On the one hand, you are likely to get quicker access and a better service from someone you know and trust. On the other, it is also possible to obtain preferential rates, if applicable, mirroring the focus group participants' notion of 'mates rates'.

The panel discussed the items in some depth and slightly amended many of them. In some cases the amendments were made to give the resource more specificity. For example, items B6 and B11 (RG-UK α3, Appendix A) were amended to 'sound' medical and legal advice respectively.

In other cases, the changes made the item more widely applicable. For example, item A5 (RG-UK α3, Appendix A) was amended from 'knows a reliable plumber' to 'knows a reliable tradesman (e.g. plumber, electrician)'.

Some items were dropped completely. For example, to distinguish the RG-UK from measures of social support, the panel discarded items relating to emotional support (items B9, B14 & B16, RG-UK α3, Appendix A) prior to the final round of ratings.

Finally, the panel suggested a number of new items for inclusion in the instrument (Appendix C, table C24). In part, these addressed a potential 'middle class' bias.

Following the discussion, the panel members were invited to re-rate the remaining items where there was no previous agreement (n=25) and the new ones (n=7). The results are in table 4.9.

**Table 4.9        Post-panel ratings summary**

| Categories | Agreed – not a useful resource | Agreed – equivocal about its use | Agreed – useful resource | No agreement |
|---|---|---|---|---|
| Items (RG-UK α3 plus additions) | A6, A7, A8, A20 | A18, A22, B10 | A3, A10, A13, A15, A21, A23, B1, B2, B3, B7, B8, B11, B13, B15, B17, B18, B19, B20, B21, B22 | A4, A5, A9, A12, A14 |

The majority of the items (n=20) were agreed as being useful social resources. However, of these, it was later decided to drop B22 ('can help you with DIY') as it duplicated A23 ('knows a lot about DIY') to a considerable extent. Only four items were agreed as not being relevant for the RG-UK (items A6, A7, A8, A20) and these were

discarded. No consensus was achieved on the remaining eight items. To achieve a consensus on these items, we included all those with a mean score of three or above (Fink et al., 1984). This resulted in the inclusion of items A4, A5, A9, A18, A22 and B10. The remaining two items were discarded. The items were re-numbered and included in RG-UK α4 (Appendix A), which included 35 items.

### 4.4.2.2 PG-UK

The panel suggested fewer amendments to the PG-UK, as it was generally less contentious than the RG-UK. Some occupations were considered to be too vague or likely to be unclear to the majority of the general population. Of these, 'scientist' and 'labourer' were changed to more specific and familiar occupations, while 'religious leader' and 'doctor' were clarified with additional information. The amendments are summarised in table C25 (Appendix C).

The panel agreed that some occupations could be rated at different points of the SOC (Office for National Statistics, 2000). For example, it could be difficult to distinguish between senior Whitehall civil servants in occupational group one (managers & senior officials) and civil servants performing more routine administrative functions roles in occupational group four (administrative & secretarial). As this also applied to 'police officer' and 'member of the armed forces', these occupations were either discarded or made more specific (Appendix C, table C25).

The panel agreed that most people will no longer know a bank manager because of the centralisation of branches and the advent of telephone and internet banking. This was discarded in favour of 'judge', as it held a similar occupational prestige and was more likely to be familiar to most people. 'Call centre operator' was also re-introduced in recognition of technological and occupational change, and replaced 'electrician', a more traditional occupation.

The only other occupation to be amended was 'farmer' by adding the prefix 'small'. This distinction was made as the panel argued that there was a significant difference in occupational prestige between large landowners and small tenant farmers. It was agreed that 'small farmer' would be more appropriate for the PG-UK as they would be more recognisable to the general population.

The RG-UK and PG-UK were supplemented by questions about network size and associational membership (Appendix A, RG-UK α4). The panel suggested that some more details about network size were needed in order to gain a greater understanding of how many people respondents are potentially requesting resources from. This question was amended in order to obtain more detailed data. However, after some discussion, the panel concluded that the question on associational membership was not required as this was more related to a different conception of social capital.

### 4.4.3   Cognitive appraisal

In general, we found that interviewees accurately understood the questions in the RG-UK and PG-UK and answered them as honestly as possible. They read the questions and appeared to interpret them in the way that the researcher had intended. Their thought processes, the questions they asked the researcher and the way that they completed the questionnaire reflected this. For example:

*"…go out socially with you? Well, who would go out socially with me? Yes, family, friend … Get you cheap goods? Well, I can do that myself but, yes, friend."* (Interviewee 1)

*"So when you say 'you have access to someone…' it means that you can actually use their service?* (Interviewee 4)
*Yes."* (Researcher)

As he read the instructions, one interviewee clarified in his mind exactly what was required:

*"The greyed area that I'm drawn to says 'Do you currently have access to someone who, for example, can repair a broken down car?' Very clear guide as to ticking 'yes' if you currently have access to someone, or 'no' if you don't. OK. And I'm reminding myself that it must be somebody I'm personally in contact with and not friends of friends, or indirect contacts."* (Interviewee 7)

When interviewees appeared unclear about the meaning of a stem question or an individual item, they thought through the problem logically and appeared to answer it correctly. This was most apparent for some of the less specific items. For example:

*"Knows a lot about government regulations? Umm, God, it depends what sort of regulations. I'd say 'yes'. That maybe colleagues at work to do things like benefits and stuff like that. And acquaintances from previous jobs. And friends, perhaps. Immediately family? I don't know. No"* (Interviewee 4)

*"Has time to help other people? That's quite a difficult one because it depends… The sort of people that I know tend to decide who they are going to help or would not help. They lead fairly busy lives, I suppose, and they decide… It's not like somebody who is just at home. As if you telephone: 'Oh, could you help?' and they could say 'Yes, but first of all let me look in my diary'. But I do know people who would have time to help and do help all the time, but it seems to be diary-operated time to help."* (Interviewee 5)

*"Sound legal advice. God, it depends what on. What if you know somebody who knows about some aspects of the law but not anything else? It's got to be very specific. Because I know people at Mind who are very good on mental health law who I could call, well, who I have called to find out things. So would I count that?* (Interviewee 4)
*What do you think?* (Researcher)
*What would I think? Aah, that's a good question. I don't know. That's why I'm asking you!* (Interviewee 4)
*If I wasn't here, how would you answer it?* (Researcher)
*Well, it has occurred to me that I've got a friend who's a lawyer and I'd ask her. But, actually whether or not an ex-colleague would count …*(Interviewee 4)
*Are you still in contact with them?* (Researcher)
*Yes, because I phone them up."* (Interviewee 4)

Interviewees varied in their approach to inapplicable items. Some followed the guidance and answered them even if they did not need to have access to it:

*"Give you sound advice on problems at work. Well I don't work, you see. What would you like me to do? But if I did work, I suppose I could easily go to a friend."* (Interviewee 5)

Respondents without children had some difficulty in answering B12 (Appendix A, RG-UK α4). They invariably ticked 'no' without considering whether or not they had access to someone who may be able to baby-sit if they did have children.

*"Well I don't have any children, so that's not applicable. So I'm checking back to the first page to see if it's not applicable to me, because it's neither yes nor no. Aah, so I wonder whether or not there's actually a box or an option to tick 'not applicable'. As I consider it not applicable, though, I'll go and tick 'no', but what I really mean is 'not applicable'. So what I am ticking now is 'no' and I'm just putting a little 'N' stroke 'A' so the reader understands what I am doing."* (Interviewee 7)

Another interviewee had difficulty with the grid layout of the questionnaire:

*"Do you know what I don't like? I don't like the grids that like …* (Interviewee 8)
*The boxes, OK, yeah* (Researcher)
*I found that really hard to follow and, like, I wear contacts and find that sort of thing is more … But I think anyone would find it a bit … I don't know how, sort of, you could do it though."* (Interviewee 8)

We reviewed the layout of the questionnaire, but could not find a clearer way to structure it.

A further change that we did not make was associated with the relationship categories. One respondent found it difficult to decide whether a family friend should be a 'friend' or an 'acquaintance' and suggested that a further column should be added. We felt that an extra relationship category would over-complicate the questionnaire and place an undue burden on respondents that may lead to response errors.

We made changes to the RG-UK in response to specific problems that our interviewees encountered that may cause other respondents to answer it erroneously. For example, in order to emphasise that parts A and B ask about the skills and resources of other people rather than the respondent themselves, we added to the guidance that respondents will be asked about their skills or resources later in the questionnaire (Appendix A, RG-UK α4).

We clarified the guidance about the professional column on the first page of the instrument. This was in response to some interviewees who ticked the 'professional only' column in addition to other relationship categories and one who assumed that it

was sufficient to know where you could find a professional if you needed them, rather than knowing them already.

We also made some minor amendments to the wording of question A of the RG-UK and added the length of time it takes to complete the questionnaire. One interviewee noted that there were no page numbers, so these were added. Further, some questions about socio-demographics were added in preparation for the first field test.

No changes were needed for the PG-UK as this appeared to be less ambiguous than the RG-UK for the interviewee to complete. They were able to look at the list of occupations and indicate whether or not they currently knew any of them. It is likely that familiarity with the format of the questionnaire from completion of the RG-UK helped them to complete the PG-UK.

### 4.4.4    Phase 1 piloting – RG-UK

#### 4.4.4.1    Item endorsement frequencies

The majority of social resources (n=28, 80%) were accessible to over half of the respondents in the first pilot (Appendix C, table C26). Similarly high endorsement frequencies (90.1%) were observed in the SSND (van der Gaag and Snijders, 2005). The average endorsement frequency for the resource items was 66.7%, rather lower than in the SSND (76%) (van der Gaag and Snijders, 2005). Methodologically, this was an improvement on the Dutch resource generator as a wide variation in item popularity was important for scaling.

The lower average endorsement frequency for our sample suggested that the RG-UK may have been a more sensitive measure of access to social resources than the Dutch version. It may have also reflected the smaller and more homogenous population in The Netherlands where respondents may have had connections with people providing a multitude of resources. Equally, though, it may merely have indicated that our respondents had smaller networks or access to fewer resources than the Dutch general population.

Items A2, B13 and B18 (RG-UK α5, Appendix A) were accessible to more than 90% of the sample (Appendix C, table C26). Virtually everyone in the sample had access to someone who owns a car (item A2). This is likely to be because car ownership is

widespread in the UK, with 85% of rural households and 68% in large urban areas, owning a car (Office for National Statistics, 2003). Similarly high proportions had access to someone who owned a car in the SSND (van der Gaag and Snijders, 2005). The other items that were accessible to almost the whole sample are equally common in British life.

The social resources that were least accessible to the sample involved more complex interactions, such as having contacts with the local media (item A13), local councillor (item A8) or someone with knowledge of government regulations (item A12). The least common item in RG-UK α5 (item A13) originated from the item that was least common in the SSND ('has good contacts with a newspaper, radio or t.v. station'), although it was accessible to only 17.3% of the sample in contrast to 32% in the SSND (van der Gaag and Snijders, 2005).

### 4.4.4.2 Missing data

There was very little missing data in the first pilot with all but one item having less than 5% missing responses (Appendix C, table C26). The exception was item B12 (baby-sit your children (if you have any)), which was not answered by 51 respondents (17.3%). It was likely that these respondents had no children and did not think that the item applied to them. We were not able to verify this assumption, as we asked no further questions about children. However, we found that there were no significant demographic differences between those who answered it and those who did not. In contrast, respondents who answered 'no' were significantly older (mean difference=8.4 years (95%CI=4.3-12.5), t=4.04, df=157.9, p<0.001) than those who answered 'yes'. It is possible that this group, whose mean age was 50.3 years, did not have any young children and foresaw no need for a babysitter. It was also possible that they genuinely had no contact with anyone who could baby-sit their children (if they had any). Whichever was nearest the truth, it was difficult to reliably ascertain how many respondents did not have access to a babysitter because those with no children either answered 'no' or missed out the item completely.

A group of three items related to employment (B11, B2 and B8) had up to 4.4% missing data (Appendix C, table C26). Of the 19 respondents who did not complete at least one of these items only two (10.5%) were employed. It is likely that the majority of those who missed these out did not complete them because they did not consider them relevant to their current circumstances.

On average, data was not available for 0.60 items per respondent. This is slightly lower than the SSND, where data was missing for 0.90 items per respondent on average (van der Gaag and Snijders, 2005). As data was gathered in the SSND by face-to-face interview, where a researcher can repeat questions until a response is obtained, this suggests that self-complete postal questionnaires can yield equally full data sets for analysis. However, a higher proportion of our sample had missing data for at least one case (29.8%vs.17% in SSND (van der Gaag and Snijders, 2005)). As MSP (Molenaar and Sijtsma, 2000) treats missing data with listwise deletion, the scaling analyses were therefore performed on proportionately fewer cases than in the SSND.

To check for potential bias caused by missing data, we examined whether respondents who did not answer at least one item (n=87) were significantly different from those who provided full data (n=208). Respondents who did not answer at least one item were older than those who provided full data (Appendix C, table C27). Respondents from Black or Asian ethnic groups were more likely not to answer all the items, as were those who were not employed. There were no significant differences according to gender, marital status or borough (Appendix C, table C27).

**Table 4.10      Pilot 1 missing data logistic regression model**

| Variable | B | Exp (*B*) | 95%CI for Exp (*B*) | p |
|---|---|---|---|---|
| Black ethnicity | 1.52 | 4.59 | 1.89-11.17 | 0.001 |
| Asian ethnicity | 0.88 | 2.41 | 0.82-7.10 | 0.110 |
| Mixed ethnicity | 0.29 | 1.34 | 0.25-7.24 | 0.737 |
| Age | 0.02 | 1.02 | 1.00-1.04 | 0.053 |
| Not employed | 0.58 | 1.78 | 1.01-3.15 | 0.048 |
| Constant | -2.12 | 0.12 | | <0.001 |

Dummy variables not tabulated: white ethnicity, employed

On average, respondents who were not in employment (mostly either retired or looking after the home) were 11.3 (95%CI=6.9–15.6) years older than those who were employed (t=5.13, df=138.1, p<0.001). However, in the logistic regression model ($r^2$=7.2%) age was confounded by employment status and no longer had an independent relationship with missing data (table 4.10). Black ethnicity remained significantly associated with respondents not completing at least one item in the questionnaire. This suggested that the RG-UK may lack some ethnic specificity and further piloting may be required. Employment status remained marginally significant in

the model, highlighting the need for careful guidance about full completion of the questionnaire, irrespective of whether or not items are currently relevant for respondents. This is in contrast to the SSND where van der Gaag and Snijders (2005) observed that more educated respondents were more likely to miss at least one item than those with less education. It is possible that they were more assertive during the interview in not giving a response to items that were not relevant to them than those with less education.

### 4.4.4.3   Access via professionals only

We asked respondents if their only access to resources was through a professional rather than a member of their informal network. This question was inserted to help us understand how many respondents had access to resources outside of their informal network. The results are shown in table C28 (Appendix C) where the items are ranked according to the proportion of respondents who could gain access to the resource only through a professional.

Unsurprisingly, resources that require a higher degree of professional skill or qualification were at the top of the list with doctors (B6), lawyers (B10), mechanics (A1), financial advisors (B1) and tradesmen (A3) comprising the top five. As over two-fifths of respondents indicated that they would go to a professional rather than a network member for medical advice this made item B6 rather redundant, especially as the vast majority of the population is registered with a GP.

At the other end of the spectrum, as one may expect, we found resources that would be typically accessed from network members. A babysitter (B12) or someone who could lend a small amount of money would typically be someone close to a respondent rather than a professional.

We decided to perform the item analysis and scaling including cases where the respondent accessed the resource via a professional rather than a network member, as it was possible that some respondents may have called them an 'acquaintance' if there was no 'professional only' column. It was precisely because of this uncertainty that we decided to omit the 'professional only' column in future drafts of the RG-UK.

#### 4.4.4.4 Item analysis

We performed item analysis by means of the Monotone Homogeneity Model (MHM) using MSP5 for Windows (MSP) (Molenaar and Sijtsma, 2000). This model is based on the assumptions of unidimensionality, local independence and monotonicity (Molenaar and Sijtsma, 2000). MHM produces a scale consisting of a set of homogenous items that are related to a single latent trait. There may be a number of sub-scales within a set of questionnaire items, but each item will only contribute to one scale. The MHM implies the ordering of respondents on an ordinal scale, so it allows us to rank order respondents according to their access to social resources.

#### 4.4.4.5 Analysis of all items

The first stage of item analysis was to inspect the item popularities of all the items (see section 4.4.4.1). Three items had very high item popularities (A2, B13 and B18, RG-UK $\alpha$5, Appendix A). Therefore we needed to treat these items with some caution in subsequent analyses.

Eight item pairs had negative covariances, which suggested that the MHM did not hold for all 35 items. However, none of the $H_i$ values were negative making it difficult to isolate candidates for removal. Therefore, we decided to remove the three items with item popularities greater than 90% one at a time to see if they were causing the negative covariances. Only removing item A2 ('owns a car') had an effect by reducing the number of negative inter-item covariances to six.

Next, we removed the item with the highest amount of missing data (B12 'baby-sit your children (if you have any)'). This reduced the number of negative covariances to four, suggesting that B12 should join A2 on the list of items for possible removal from the scale.

For each of the above analyses, item B6 ('give you sound medical advice') had unacceptably low item homogeneity ($H_i$=0.22 or 0.23). As this item was most frequently accessed through a professional rather than a member of a respondent's informal network, we decided to test the effect of its removal on the scale. Removal of this item reduced the number of negative covariances to six.

At this point, we decided to remove items A2, B12 and B6 from the scale as they were all contributing to the negative inter-item covariance. We also decided to remove B13 and B18 because of their unacceptably high item popularities that made them virtually redundant. Of the remaining 30 items, there was only one item pair with negative covariances (A1 and A13), there were no negative $H_i$ values and scale $H$=0.35. As there was no a priori reason to discard A1 or A13 (item popularities and missing data were not a problem here), we inspected the item response functions for further information.

MSP performs three checks of the item response functions for a given set of items. Firstly, it checks for violations in the model assumption of monotonicity, which means that the probability of answering positively to an item is a non-decreasing function of the latent trait value (Molenaar and Sijtsma, 2000). The basis of this procedure is the item-rest regression, which is an estimate of the item response function of the item under investigation (item $i$). The item-rest regression is the regression of the score from item $i$ on the restscore (the sum of all the items except $i$). To check for violations of monotonicity, the respondents were grouped according to their restscore and the item-rest regressions were calculated for each item in each group. Item-rest regressions should be non-decreasing as the respondents' scores increase (Sijtsma and Molenaar, 2002).

Violations in monotonicity are summarised in MSP using a diagnostic value *Crit* per item, which combines evidence about the item's H-value ($H_i$), the frequency and the size of the violations and their significance. In most circumstances, *Crit* values greater than 80 provide a strong indication that an item violates this assumption (Molenaar and Sijtsma, 2000). For our remaining 30 items, there were no violations of monotonicity.

Secondly, the restscore method checks for intersection of the item response functions of pairs of items. This method compares every item with each other in turn. Within each item pair, the more popular one follows the less popular one and the respondents are grouped according to their restscore (here defined as the sum of all the items minus the pair under consideration). A violation occurs if the more popular item is less popular in a certain restscore group (Sijtsma and Molenaar, 2002). In our set of 30 items, there were a number of intersections. However, the violations were minor and none of the *Crit* values exceeded 80, so there were no strong indications for removal of any further items at this stage.

The third method is inspection of the P matrices (Mokken, 1971). Items are ordered in a matrix according to their popularity in the sample in both rows and columns. Each cell of the P(+,+) matrix contains the proportion of the sample who score 1 ('yes') on both the items that it corresponds with. Conversely, each cell of the P(-,-) matrix contains the proportion of the sample who score 0 ('no') on both its items. The rows, and by symmetry the columns, of the P(+,+) matrix are non-decreasing, and of P(-,-) non-increasing (Sijtsma and Molenaar, 2002). MSP inspects the P matrices and calculates *Crit* values to summarise violations of expected orderings within them (Molenaar and Sijtsma, 2000). In our set of 30 items, there were numerous violations of expected ordering in the P matrices. Item B2 had the highest number of violations, but they were relatively minor as its *Crit* value was 67. As no items had *Crit* values above 80, we retained all the items at this stage and moved on to internal scaling.

### 4.4.4.6   Internal scaling

Mokken scaling begins with the pair of items with the highest pairwise $H$ from a set of items. Items are added to these one at a time if they have positive pairwise $H$ with all the other items in the scale and their $H_i$ with respect to these items is larger than or equal to a minimum $H_i$ value (MSP default is $H_i = 0.3$ (Molenaar and Sijtsma, 2000)). From all the possible items, the one that leads to the highest $H$ value for the set of items is chosen. The process ends when either there are no items left in the pool or none of the remaining items qualify. However, it continues to form scales from the remaining items via the same process until there are no items left or the remaining items cannot be joined (Mokken, 1971). Generally, if the minimum acceptable value for $H_i$ is set lower than 0.3, MSP commonly produces large scales with lower $H$. If the minimum acceptable value for $H_i$ is set higher than 0.3, the result is smaller scales with higher $H$ (Molenaar and Sijtsma, 2000).

We examined the internal domains of the RG-UK using the 'search normal' function within MSP. This is a 'bottom up' exploratory procedure that draws together the best-fitting items into sub-scales. A good scale has a satisfactory scale $H$ and item $H$ ($H_i$), a sufficiently high reliability and a satisfactory distribution of the total score across respondents with no floor or ceiling effects (Molenaar and Sijtsma, 2000). Items can be removed to improve scalability, but only with consideration to their content. Detailed evaluation of the model assumptions can be made after items are grouped together satisfactorily.

Beginning with the minimum value for $H_i$ of 0.3, MSP produced two scales for the RG-UK. The first consisted of 25 items ($H$=0.39) and the second consisted of three items ($H$=0.47). Secondly, we used a minimum value for $H_i$ of 0.35 and MSP produced three scales of 21 items ($H$=0.43), four items ($H$=0.43) and three items ($H$=0.41) respectively.

Finally, we used a minimum value for $H_i$ of 0.4. MSP produced five scales with improved homogeneity but with fewer items in each (Appendix C, table C29). Scale one contained a number of items relating to work and the professional sphere, and scale two consisted solely of items relating to the home and domestic sphere. As scale two was the most homogenous and best fitting scale we tested its model assumptions before examining the remaining item sets.

### 4.4.4.7   Domestic resources sub-scale

After items are grouped according to the exploratory procedure in MSP, the program allows the user to test scales for violations of model assumptions (Molenaar and Sijtsma, 2000). We performed the test on the domestic resources sub scale, which confirmed that it had a good spread of item popularities with no obvious floor or ceiling effects (table 4.11). All the items had good individual $H_i$ values and the scale as a whole had a strong homogeneity ($H$=0.52) and a good reliability ($\rho$=0.78). In particular, there were no violations of the three model assumptions referred to above and we concluded that the items formed a meaningful scale.

### 4.4.4.8   Expert advice sub-scale

Most of the items in scale one (Appendix C, table C29) either referred to employment or were professional resources. Four of the items did not appear to fit in – A14 ('has time to help other people'), A15 ('knows a lot about health and fitness'), B5 ('do your shopping if you are ill') and B7 ('lend you a small amount of money'). These all had low $H_i$ values and by removing them one at a time we assessed their individual contribution to the sub-scale as a whole. Removing A14, B5 and B7 individually had very little effect as $H$=0.47 and $\rho$=0.84 in each case. Similarly, removing A15 changed the scale very little as $H$=0.48 and $\rho$=0.84 when that was removed. However, when all four were removed the scale became much stronger with $H$=0.51 and $\rho$=0.83.

There remained some minor violations of the model assumptions, so we investigated if removal of any further items could improve the integrity of the scale. The item with the

lowest $H_i$ value was A8 ('is a local councillor') and removing this item improved the scale further to $H$=0.54 and reduced some of the violations. Some minor violations remained after A8 was removed (table 4.12), but removing any further items did not improve its scale $H$ and compromised its reliability. The remaining nine items formed a strong and reliable scale (table 4.12).

After confirming the first two internal scales, we returned to the remaining 14 items and repeated the search procedure in MSP. Eleven of the remaining items formed two scales with acceptable homogeneity and reliability, but the other three items did not fit with either scale or each other. The scales were weaker than the first two, but were still useful and reliable. We termed them the 'personal skills' and 'problem solving resources' sub-scales respectively.

### 4.4.4.9   Personal skills sub-scale

This group of items had a low, but still acceptable, scale $H$ (0.37) and a lower reliability ($\rho$=0.69) than the previous two scales (table 4.13). However, there were no violations of the model assumptions and removing or adding any items could not improve it. The six items theoretically fitted together as they all related to different skills that individuals may possess. Two are less obvious fits. Firstly, although it is not explicit, network members who work for the local council (A9) are likely to have a specific skill that is employed in the service of the local authority. Also, they may be in a good position to know other people within the council who could perform useful tasks for local people. Secondly, network members who can sometimes employ other people (A11) are likely themselves to have particular skills or attributes, although these are not clearly defined. In any case, these items fitted with the scale as they all contributed to 'getting the job done'.

### 4.4.4.10  Problem solving resources sub-scale

The final scale of five resources had a good homogeneity ($H$=0.42), though its reliability ($\rho$=0.60) was lower due to the smaller number of items (table 4.14). There were no violations of the model assumptions and removing or adding any items did not improve it any further. Each of the five resources may be needed in difficult situations that may prove frustrating if they are not resolved. For example, having someone to do shopping if you are ill (B5) or knowing your local councillor (A8) are both very useful for solving practical problems.

**Table 4.11    Diagnostics for RG-UK domestic resources sub-scale**

| Item (RG-UK α5) | Mean | $H_i$ | Monotonicity (*Crit*) | Restscore (*Crit*) | P matrices (*Crit*) |
|---|---|---|---|---|---|
| A17 - knows a lot about DIY | 0.84 | 0.40 | 0 | 0 | 0 |
| B3 - help you to move or dispose of bulky items | 0.81 | 0.43 | 0 | 0 | 0 |
| B4 - help you with small jobs around the house | 0.88 | 0.58 | 0 | 0 | 0 |
| B14 - get you cheap goods or 'bargains' | 0.53 | 0.54 | 0 | 0 | 0 |
| B15 - help you to find somewhere to live if you had to move home | 0.65 | 0.56 | 0 | 0 | 0 |
| B16 - lend you a large amount of money | 0.46 | 0.59 | 0 | 0 | 0 |
| B17 - look after your home or pets if you go away | 0.86 | 0.51 | 0 | 0 | 0 |

n=276, *H*=0.52, *ρ*=0.78, mean(sd)=5.02(1.88)

**Table 4.12    Diagnostics for RG-UK expert advice sub-scale**

| Item (RG-UK α5) | Mean | $H_i$ | Monotonicity (*Crit*) | Restscore (*Crit*) | P matrices (*Crit*) |
|---|---|---|---|---|---|
| A7 - has a professional occupation | 0.88 | 0.60 | 0 | 0 | 0 |
| A12 - knows a lot about government regulations | 0.43 | 0.58 | 0 | 0 | 0 |
| A13 - has good contacts with the local newspaper, radio or t.v. | 0.18 | 0.46 | 0 | 0 | 0 |
| B1 - give you sound advice about money problems | 0.70 | 0.49 | 0 | 32 | 27 |
| B2 - give you sound advice on problems at work | 0.70 | 0.58 | 0 | 28 | 22 |
| B8 - give you careers advice | 0.50 | 0.52 | 0 | 0 | 0 |
| B9 - discuss politics with you | 0.59 | 0.52 | 0 | 0 | 0 |
| B10 - give you sound legal advice | 0.55 | 0.49 | 0 | 0 | 0 |
| B11 - give you a good reference for a job | 0.85 | 0.61 | 0 | 0 | 0 |

n=266, *H*=0.54, *ρ*=0.83, mean(sd)=5.36(2.51)

**Table 4.13    Diagnostics for RG-UK personal skills sub-scale**

| Item (RG-UK α5) | Mean | $H_i$ | Monotonicity (*Crit*) | Restscore (*Crit*) | P matrices (*Crit*) |
|---|---|---|---|---|---|
| A1 - can repair a broken-down car | 0.72 | 0.34 | 0 | 0 | 0 |
| A3 - is a reliable tradesman | 0.76 | 0.39 | 0 | 0 | 0 |
| A6 - is good at gardening | 0.83 | 0.45 | 0 | 0 | 0 |
| A9 - works for the local council | 0.43 | 0.32 | 0 | 0 | 0 |
| A11 - can sometimes employ people | 0.56 | 0.36 | 0 | 0 | 0 |
| A15 - knows a lot about health and fitness | 0.65 | 0.36 | 0 | 0 | 0 |

n=279, *H*=0.37, $\rho$=0.69, mean(sd)=3.95(1.67)

**Table 4.14    Diagnostics for RG-UK problem solving resources sub-scale**

| Item (RG-UK α5) | Mean | $H_i$ | Monotonicity (*Crit*) | Restscore (*Crit*) | P matrices (*Crit*) |
|---|---|---|---|---|---|
| A4 - can speak another language | 0.60 | 0.45 | 0 | 0 | 0 |
| A5 - knows how to fix problems with computers | 0.77 | 0.39 | 0 | 0 | 0 |
| A8 - is a local councillor | 0.23 | 0.54 | 0 | 0 | 0 |
| B5 - do your shopping if you are ill | 0.90 | 0.34 | 0 | 0 | 0 |
| B7 - lend you a small amount of money | 0.90 | 0.41 | 0 | 0 | 0 |

n=287, *H*=0.42, $\rho$=0.60, mean(sd)=3.39(1.17)

**4.4.4.11  RG-UK scale**

We assessed whether the 27 items that made up the four sub-scales could form one scale by running the test procedure in MSP on these items. The homogeneity of this item set was low ($H = 0.37$), though it was sufficient to form a scale. However, there were a number of minor violations of the model assumptions (table 4.15) that brought into question its high reliability statistic ($\rho = 0.89$) (Sijtsma and Molenaar, 2002). B2 ('give you sound advice on problems at work') had the most violations of the restscore and the P matrices, although A1 ('can repair a broken down car') was the worst fitting item with an item $H$ of 0.26. Item B5 ('do your shopping if you are ill') violated none of the model assumptions, whereas A12 ('knows a lot about government regulations') was the best fitting item with an item $H$ of 0.48 (table 4.15). The RG-UK appeared to be a stronger scale than the one used in the SSND as the scale $H$ for the latter was only 0.21 (van der Gaag and Snijders, 2005).

Three items did not fit into any scale. A10 ('has a place where you can go for an enjoyable break'), A14 ('has time to help other people') and A16 ('is good at sewing') were therefore discarded from the final item pool.

Within-scale item correlations were positive and significant (Appendix C, table C30). As in van der Gaag & Snijders (2005), we grouped the items within their scales in order of popularity, starting with the rarest resource in each scale. Table C30 (Appendix C) shows that if one has access to someone who could lend a large amount of money (B16), one is more likely to have access to other resources within the domestic scale such as someone who could get cheap goods (A14) or could help one find somewhere to live if one had to move home (B15), for example. Similarly, if one knows someone with good contacts with the local media (A13) one is also likely to know someone knowledgeable about government regulations. The same is true for the other two scales. Most of the items are correlated with items from other scales, though none is correlated with every other item. This is further evidence of the separate sub-domains of social capital that can be accessed through informal networks.

**Table 4.15    Diagnostics for RG-UK scale**

| Item (RG-UK α5) | Mean | $H_i$ | Monotonicity (*Crit*) | Restscore (*Crit*) | P matrices (*Crit*) |
|---|---|---|---|---|---|
| A1 | 0.71 | 0.26 | 0 | 61 | 37 |
| A3 | 0.76 | 0.34 | 0 | 32 | 17 |
| A4 | 0.62 | 0.27 | 0 | 48 | 58 |
| A5 | 0.79 | 0.31 | 0 | 29 | 10 |
| A6 | 0.83 | 0.33 | 0 | 27 | 28 |
| A7 | 0.88 | 0.40 | 0 | 32 | 7 |
| A8 | 0.24 | 0.44 | 0 | 0 | 8 |
| A9 | 0.43 | 0.31 | 0 | 61 | 62 |
| A11 | 0.57 | 0.33 | 0 | 42 | 29 |
| A12 | 0.42 | 0.48 | 0 | 38 | 35 |
| A13 | 0.18 | 0.34 | 0 | 0 | 14 |
| A15 | 0.65 | 0.36 | 0 | 32 | 24 |
| A17 | 0.86 | 0.41 | 0 | 0 | 19 |
| B1 | 0.69 | 0.37 | 0 | 45 | 43 |
| B2 | 0.69 | 0.44 | 0 | 64 | 80 |
| B3 | 0.80 | 0.34 | 0 | 37 | 0 |
| B4 | 0.90 | 0.39 | 0 | 32 | 19 |
| B5 | 0.90 | 0.38 | 0 | 0 | 0 |
| B7 | 0.90 | 0.42 | 0 | 0 | 5 |
| B8 | 0.50 | 0.42 | 0 | 35 | 46 |
| B9 | 0.59 | 0.36 | 0 | 15 | 23 |
| B10 | 0.56 | 0.38 | 0 | 41 | 13 |
| B11 | 0.84 | 0.45 | 0 | 32 | 22 |
| B14 | 0.53 | 0.37 | 0 | 25 | 5 |
| B15 | 0.66 | 0.37 | 0 | 40 | 22 |
| B16 | 0.48 | 0.39 | 0 | 39 | 20 |
| B17 | 0.87 | 0.38 | 0 | 0 | 8 |

n=242, *H*=0.37, *ρ*=0.89, mean(sd)=17.87(5.81)

## 4.4.5    Phase 1 piloting – PG-UK

### 4.4.5.1    Item endorsement frequencies

There was a large range of item popularities from the least accessed occupations – member of parliament (8.5%) and judge (9.8%) – to the most frequently accessed occupations – school teacher (66.8%) and sales assistant (63.4%) (Appendix C, table C31). No floor or ceiling effects were apparent for individual items.

**4.4.5.2   Missing data**

There was even less missing data in the PG-UK than the RG-UK. On average, data was not available for only 0.43 occupations per respondent. 30 respondents (10.2%) did not complete at least one occupation, but only three (1.0%) omitted more than four occupations. In fact, these three respondents only gave an answer to a total of seven (out of a possible 90) occupations between them. One of these ticked 'yes' to six items, but failed to answer the others, possibly because he did not consider it necessary to tick the 'no' box. Another answered none at all, possibly indicating that the questionnaire was too long.

The 30 respondents who missed at least one occupation did not differ from the other respondents by age, gender, ethnicity or whether or not they were employed. However widowed people were more likely to miss at least one occupation than people of other marital statuses (31.3%vs.9.0%, $\chi^2(1)=5.97$, p=0.015).

Only two occupations had more than 2% missing responses (sales assistant and publican, table C31, Appendix C), but only eight respondents (2.7%) failed to complete these. It is not sufficient to justify their removal from the instrument on the basis of missing data alone.

**4.4.5.3   Access via professionals only**

Many respondents accessed occupations through professionals rather than members of their networks. For example, over a third of the respondents who knew a doctor knew them as a professional rather than a member of their family, friend or as an acquaintance. This reflects the result of item B6 in the RG-UK (see section 4.4.4.3). As virtually everyone in the UK is registered with a GP this item is redundant with a 'professional only' column. Other occupations that a high proportion of respondents access through professionals only – undertaker (21.2%), Member of Parliament (20.0%), solicitor (18.0%) – are occupations that most people can access quite easily on a professional basis. As the PG-UK measures access to occupational prestige from informal networks, the inclusion of a question of access via professionals distorts responses, as it cannot be confirmed that they knew them personally. Therefore, as in the RG-UK, we decided to remove the 'professional only' option to ensure respondents gave positive responses only to people that they knew personally. We also decided to remove doctor from the PG-UK to avoid any further potential confusion.

### 4.4.5.4 Item analysis

We did not expect the PG-UK to form a homogenous scale, as it is simply a list of different occupations. This was confirmed by an analysis of the remaining 29 occupations in MSP (Molenaar and Sijtsma, 2000) which had a scale $H$ of 0.22. Although none of the occupations had negative $H_i$ values, 14 item pairs had negative item covariances and there were numerous potential candidates for removal. As we were unlikely to improve the $H$ value for the scale as a whole without removing many items and potentially making the instrument meaningless, we decided to focus on its internal domains.

### 4.4.5.5 Professional occupations sub-scale

We used the 'search normal' procedure within MSP with a minimum value for $H_i$ set at 0.4 to produce some robust internal scales. This produced seven scales, of which the first was the only one with sufficient reliability and homogeneity. As this contained occupations that required some degree of professional training, we termed it the professional occupations sub-scale (table 4.16). This sub-scale of six occupations had good homogeneity ($H$=0.45) and sufficient reliability ($\rho$=0.66) with no negative item covariances and no violations of the assumptions of Mokken scaling (Sijtsma and Molenaar, 2002) (table 4.16). The six occupations had a mean (sd) prestige score of 297.67 (53.03), making it the group with the highest level of occupational prestige.

We repeated the search in MSP on the remaining 22 items with a minimum value for $H_i$ set at 0.3, but specified a maximum of three scales to avoid the production of scales with little use. This produced three further potentially useful scales (Appendix C, table C32). Scale one contained occupations that required some skill and knowledge, but not extensive professional training (although judge was the obvious exception to this). Scale two contained routine occupations that required very little skill or training and scale three had three occupations related to the production of food. We explored and tested the model assumptions of each scale in turn.

### 4.4.5.6 Skilled occupations sub-scale

Scale one consisted mainly of occupations that required some skill, but no professional qualification (Appendix C, table C32). The main exception to this was judge, as a high degree of professional training and experience is required for this position and it holds

much greater occupational prestige than the others in the group (e.g. its prestige score is 316 in contrast to 116 for a secretary). It intuitively fitted with the professional occupation sub-scale, but was not included in it by MSP. However, removing it from this group had little effect on the sub-scale as a whole ($H$=0.35, $\rho$=0.62) and therefore we decided to exclude it from the scale.

Removing judge from the sub-scale diminished the item homogeneity of postal worker, which was already the weakest item in the group. Removal of this item strengthened the sub-scale and removed the violations of the model assumptions that were present. The remaining five items formed a moderately strong scale ($H$=0.40) with sufficient reliability ($\rho$=0.61) with no negative item covariances and no violations of the assumptions of Mokken scaling (table 4.17). In terms of occupational prestige, the mean prestige score of the five items (117) appropriately placed it below the professional scale.

It could be argued that the item 'street trader', although it had good item homogeneity, does not fit with these occupations because it required little or no formal training. However, it could equally be argued that a high degree of skill, often acquired informally, is required to make a successful living from this occupation. In this sense, it could be argued that it is a skilled occupation.

### 4.4.5.7   Low skilled occupations sub-scale

Scale two (Appendix C, table C32) consisted of three occupations that could be considered to be 'routine' or require little skill. Both conceptually and empirically, they appeared to fit together well. An evaluation of its model assumptions revealed that they formed a moderately strong scale ($H$=0.43), although with only moderate reliability ($\rho$=0.52) because of the small number of items in the scale. There were no negative item covariances and no violations of the assumptions of Mokken scaling (table 4.18). Further, its mean prestige score of 41 made it the scale with the least occupational prestige.

**Table 4.16    Diagnostics for PG-UK professional occupations sub-scale**

| Occupation | Prestige score | Mean | H$_i$ | Monotonicity (*Crit*) | Restscore (*Crit*) | P matrices (*Crit*) |
|---|---|---|---|---|---|---|
| Member of Parliament | 356 | 0.09 | 0.40 | 0 | 0 | 0 |
| University Professor | 308 | 0.20 | 0.46 | 0 | 0 | 0 |
| Solicitor | 315 | 0.44 | 0.47 | 0 | 0 | 0 |
| Journalist | 197 | 0.11 | 0.41 | 0 | 0 | 0 |
| School teacher | 307 | 0.67 | 0.44 | 0 | 0 | 0 |
| Accountant | 303 | 0.50 | 0.45 | 0 | 0 | 0 |

n=288, *H*=0.45, $\rho$=0.66, scale mean (sd)=2.02(1.50), mean prestige score (sd)=297.7(53.0)

**Table 4.17    Diagnostics for PG-UK skilled occupations sub-scale**

| Occupation | Prestige score | Mean | H$_i$ | Monotonicity (*Crit*) | Restscore (*Crit*) | P matrices (*Crit*) |
|---|---|---|---|---|---|---|
| Secretary | 116 | 0.55 | 0.40 | 0 | 0 | 0 |
| Travel agent | 76 | 0.30 | 0.39 | 0 | 0 | 0 |
| Estate agent | 194 | 0.24 | 0.37 | 0 | 0 | 0 |
| Street trader | 58 | 0.12 | 0.42 | 0 | 0 | 0 |
| Builder | 140 | 0.63 | 0.45 | 0 | 0 | 0 |

n=286, *H*=0.40, $\rho$=0.61, scale mean (sd)=1.83(1.36), mean prestige score (sd)=116.8(53.9)

**Table 4.18        Diagnostics for PG-UK low skilled occupations sub-scale**

| Occupation | Prestige score | Mean | $H_i$ | Monotonicity (*Crit*) | Restscore (*Crit*) | P matrices (*Crit*) |
|---|---|---|---|---|---|---|
| Sales assistant | 58 | 0.65 | 0.55 | 0 | 0 | 0 |
| Factory worker | 9 | 0.35 | 0.40 | 0 | 0 | 0 |
| Call centre operator | 56 | 0.24 | 0.36 | 0 | 0 | 0 |

n=282, *H*=0.43, *ρ*=0.52, mean(sd)=1.24(0.97), mean prestige score (sd)=41.0(27.7)

**Table 4.19        Diagnostics for PG-UK food chain occupations sub-scale**

| Occupation | Prestige score | Mean | $H_i$ | Monotonicity (*Crit*) | Restscore (*Crit*) | P matrices (*Crit*) |
|---|---|---|---|---|---|---|
| Gardener | 147 | 0.47 | 0.31 | 0 | 0 | 0 |
| Small farmer | 147 | 0.25 | 0.41 | 0 | 0 | 0 |
| Butcher | 137 | 0.27 | 0.39 | 0 | 0 | 0 |

n=292, *H*=0.37, *ρ*=0.55, mean(sd)=0.99(0.99), mean prestige score (sd)=143.7(5.8)

### 4.4.5.8   Food chain occupations sub-scale

Finally, MSP produced a sub-scale that consisted of three occupations that contribute to the food chain. Again, these appear to fit together well, both conceptually and empirically, and the scale could not be improved by adding any of the remaining items. The three occupations formed an acceptable scale ($H$=0.37), which had moderate reliability ($\rho$=0.55). As in the other scales, there were no negative item co-variances and no violations of the assumptions of Mokken scaling (table 4.19). The mean prestige score of the three occupations (144) placed the scale between the professional and skilled occupations sub-scales in the hierarchy of occupational prestige.

### 4.4.5.9   PG-UK scale

As in our previous analysis of all the RG-UK items, the 17 PG-UK items did not form a homogenous scale (scale $H$=0.26), as they were collections of different latent traits. However, to be able to measure volume and diversity of occupational prestige using one scale we felt it necessary to retain a single scale that included occupations from all social strata.

The 17 occupations in the four sub scales were clustered at the two ends of the occupational prestige scale. There were five occupations with a prestige score over 300 and twelve with a score under 200, but none in between. To address this disparity, we retained police constable and nurse that had an occupational prestige of 201 and 204 respectively. These occupations were unambiguous with high item popularities (Appendix C, table C31).

Further, of the twelve occupations with a prestige score under 200, only five had a score under 100. To ensure that the measure was broadly representative of the UK occupational structure (Office for National Statistics, 2003), we retained an occupation with a low prestige score that would otherwise have been discarded. We selected undertaker, as it was unambiguous and had low item popularity (Appendix C, table C31). Its relative infrequency in this sample balanced out the addition of the better-known occupations of police constable and nurse.

The final scale of 20 occupations did not form a homogenous scale as its scale *H* was below 0.3 (table 4.20). However, although there were numerous violations of the model assumptions, as in the RG-UK scale (see section 4.4.4.11), these were only minor.

**Table 4.20        Diagnostics for PG-UK scale**

| Occupation | Prestige score | Mean | $H_i$ | Monotonicity (Crit) | Restscore (Crit) | P matrices (Crit) |
|---|---|---|---|---|---|---|
| Sales assistant | 58 | 0.64 | 0.25 | 0 | 43 | 17 |
| Factory worker | 9 | 0.35 | 0.18 | 0 | 33 | 28 |
| Gardener | 147 | 0.47 | 0.19 | 0 | 46 | 62 |
| Member of Parliament | 356 | 0.09 | 0.30 | 0 | 0 | 0 |
| Secretary | 116 | 0.54 | 0.28 | 0 | 0 | 22 |
| Travel agent | 76 | 0.30 | 0.26 | 0 | 42 | 20 |
| University professor | 308 | 0.19 | 0.21 | 0 | 20 | 27 |
| Estate agent | 194 | 0.24 | 0.24 | 0 | 45 | 29 |
| Small farmer | 147 | 0.25 | 0.31 | 0 | 49 | 34 |
| Solicitor | 315 | 0.43 | 0.31 | 0 | 57 | 59 |
| Journalist | 197 | 0.12 | 0.21 | 0 | 39 | 27 |
| Butcher | 137 | 0.28 | 0.22 | 0 | 38 | 22 |
| Police constable | 201 | 0.42 | 0.22 | 0 | 52 | 57 |
| Street trader | 58 | 0.12 | 0.26 | 0 | 27 | 29 |
| School teacher | 307 | 0.67 | 0.30 | 0 | 30 | 0 |
| Accountant | 303 | 0.50 | 0.31 | 0 | 34 | 59 |
| Builder | 140 | 0.62 | 0.34 | 0 | 30 | 17 |
| Nurse | 204 | 0.58 | 0.24 | 0 | 17 | 19 |
| Undertaker | 74 | 0.12 | 0.25 | 0 | 31 | 18 |
| Call centre operator | 56 | 0.23 | 0.18 | 0 | 54 | 49 |

n=272, H=0.25, ρ=0.79, mean(sd)=7.16(3.92), mean prestige score(sd)=170.2(103.3)

Inter-item correlations of the occupations in the PG-UK were positive and mostly significant (Appendix C, table C33). However, they were slightly weaker and a larger number than in the RG-UK were not significant (Appendix C, table C30). This is possibly because of the lower endorsement frequencies.

The inter-item correlation matrix of occupations in the PG-UK (Appendix C, table C33) starts with the occupation that the least people have any personal contact with (Member of Parliament) and ascends until it reaches the most popular (school teacher). A visual inspection of the matrix reveals that knowing somebody with an occupation that is less known in the sample does not necessarily mean that you will know somebody with an occupation that is better known. For example, the four most infrequently known occupations (Member of Parliament, journalist, street trader and

undertaker) had either a weak or no correlation with the most popular (school teacher). However, it is interesting to note that the occupation correlated with the most other occupations was small farmer. This may suggest that respondents in rural communities, or with networks extending into rural communities, had contact with a larger number of different occupations.

### 4.4.6 Phase 2 piloting – test-retest reliability

### 4.4.6.1 RG-UK

The kappa coefficients for the RG-UK items ranged from 0.33 to 0.85 (table 4.21). The majority of items had good or excellent reliability, but two items (B1 –'give you sound advice about money problems' and B12 – 'help you to find somewhere to live if you had to move home') had a poor reliability. As these two items both made strong contributions to the domestic and expert advice sub-scales (tables 4.11 and 4.12), we decided to retain them.

There was no systematic variation in kappa coefficients according to sub-scale. However, a visual inspection of table 4.21 reveals that all except one of the items from the personal skills sub-scale had a good or excellent reliability, whereas all the items in the problem solving resources sub-scale had moderate reliability (0.48 to 0.62).

The intraclass correlation coefficient for the RG-UK scale (r=0.67) indicated that the scale had good test-retest reliability. Similarly, the domestic resources (r=0.61) and personal skills (r=0.66) sub-scales had good test-retest reliability. However, the expert advice sub-scale had only fair reliability (r=0.49) and the problem solving resources reliability was poor (r=0.35).

**Table 4.21        RG-UK item test-retest reliability**

| Item (RG-UK β) | Kappa | p |
|---|---|---|
| A2 – is a reliable tradesman | 0.85 | <0.001 |
| A11 – has good contacts with the local newspaper, radio or t.v. | 0.83 | <0.001 |
| B8 – discuss politics with you | 0.82 | <0.001 |
| B13 – lend you a large amount of money | 0.78 | <0.001 |
| A1 – can repair a broken down car | 0.74 | <0.001 |
| A13 – knows a lot about DIY | 0.70 | <0.001 |
| B9 – give you sound legal advice | 0.70 | <0.001 |
| A9 – can sometimes employ people | 0.69 | <0.001 |
| A5 – is good at gardening | 0.66 | <0.001 |
| A8 – works for your local council | 0.65 | <0.001 |
| B14 – look after your home or pets if you go away | 0.64 | <0.001 |
| B2 – give you sound advice on problems at work | 0.63 | <0.001 |
| A7 – is a local councillor | 0.62 | <0.001 |
| B11 – get you cheap goods or 'bargains' | 0.61 | <0.001 |
| A10 – knows about government regulations | 0.59 | <0.001 |
| A3 – can speak another language fluently | 0.58 | <0.001 |
| A4 – knows how to fix problems with computers | 0.56 | <0.001 |
| B7 – give you careers advice | 0.52 | <0.001 |
| B6 – lend you a small amount of money | 0.48 | 0.001 |
| B10 – give you a good reference for a job | 0.48 | <0.001 |
| A12 – knows a lot about health and fitness | 0.45 | 0.001 |
| B3 – help you to move or dispose of bulky items | 0.45 | 0.001 |
| B4 – help you with small jobs around the house | 0.45 | 0.001 |
| B12 – help you to find somewhere to live if you had to move home | 0.37 | 0.004 |
| B1 – give you sound advice about money problems | 0.33 | <0.01 |

**Key:**

Domestic resources sub-scale

Expert advice sub-scale

Personal skills sub-scale

Problem solving resources sub-scale

* Kappa values could not be computed for A6 ('has a professional occupation') and B5 ('do your shopping if you are ill') as all the values were constant at one time point

### 4.4.6.2   PG-UK

The kappa coefficients for the PG-UK occupations ranged from 0.51 to 1 (table 4.22). All except two occupations had good or excellent reliability. Two occupations (factory worker and Member of Parliament) had perfect test-retest reliability and a further two (police constable and undertaker) came very close with k=0.96 and k=0.93 respectively. As in the RG-UK, there was no systematic variation in kappa coefficients according to sub-scale (table 4.22).

**Table 4.22     PG-UK item test-retest reliability**

| Occupation (PG-UK β) | Kappa | P |
|---|---|---|
| 2 … Factory worker | 1 | <0.001 |
| 4 … Member of Parliament | 1 | <0.001 |
| 13 … Police constable | 0.96 | <0.001 |
| 19 … Undertaker | 0.93 | <0.001 |
| 7 … University professor | 0.83 | <0.001 |
| 12 … Butcher | 0.76 | <0.001 |
| 9 … Small farmer | 0.75 | <0.001 |
| 17 … Builder | 0.75 | <0.001 |
| 20 … Call centre operator | 0.73 | <0.001 |
| 6 … Travel agent | 0.72 | <0.001 |
| 8 … Estate agent | 0.69 | <0.001 |
| 10 … Solicitor | 0.64 | <0.001 |
| 15 … School teacher | 0.63 | <0.001 |
| 11 … Journalist | 0.63 | <0.001 |
| 3 … Gardener | 0.62 | <0.001 |
| 5 … Secretary | 0.62 | <0.001 |
| 14 … Street trader | 0.62 | <0.001 |
| 16 … Accountant | 0.62 | <0.001 |
| 18 … Nurse | 0.53 | <0.001 |
| 1 … Sales assistant | 0.51 | <0.001 |

**Key:**

Professional occupations sub scale
Skilled occupations sub-scale
Low-skilled occupations sub-scale
Food chain occupations sub-scale

The intraclass correlation coefficient for the PG-UK scale (r=0.68) indicated good reliability. Similar results were found for the food chain occupations (r=0.68), skilled occupations (r=0.66) and professional occupations (r=0.59) sub-scales. Only the low skilled occupations sub-scale dipped below this threshold (r=0.57).

### 4.4.7    Phase 2 piloting – RG-UK population norms

### 4.4.7.1    Item endorsement frequencies

A smaller number of the resources in RG-UK β (Appendix A) were accessible to over 50% of respondents in the second pilot than in the first (66%vs.80%) (table 4.23). The average endorsement frequency was reduced from 66.7% in the first pilot to 62.1% in the second. This may have been achieved by removing some of the more popular items or by removing the 'professionals only' column following the first pilot.

**Table 4.23       RG-UK β item frequencies and missing data**

| | Do you currently have access to someone who…? | n | % 'Yes' | Imm. family | Wid. family | Friend | Neigh. | Colleague | Acquain. | % Missing |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **If yes, % access through:** | | | | | | |
| A1 | can repair a broken-down car | 330 | 59.1 | 37.9 | 11.8 | 32.8 | 8.7 | 5.6 | 17.9 | 1.5 |
| A2 | is a reliable tradesman | 328 | 72.0 | 30.9 | 11.4 | 39.4 | 5.9 | 3.0 | 21.2 | 2.1 |
| A3 | can speak another language fluently | 331 | 49.6 | 42.1 | 14.0 | 42.1 | 7.9 | 15.2 | 7.9 | 1.2 |
| A4 | knows how to fix problems with computers | 325 | 73.2 | 38.2 | 12.6 | 34.9 | 2.1 | 15.1 | 10.9 | 3.0 |
| A5 | is good at gardening | 330 | 80.3 | 60.8 | 12.8 | 22.6 | 7.9 | 2.6 | 7.2 | 1.5 |
| A6 | has a professional occupation | 327 | 82.9 | 56.8 | 20.7 | 41.0 | 12.2 | 19.9 | 16.6 | 2.4 |
| A7 | is a local councillor | 329 | 26.4 | 9.2 | 6.9 | 28.7 | 8.0 | 3.4 | 50.6 | 1.8 |
| A8 | works for your local council | 328 | 40.9 | 26.1 | 10.4 | 36.6 | 6.7 | 9.7 | 24.6 | 2.1 |
| A9 | can sometimes employ people | 329 | 56.8 | 36.4 | 17.1 | 38.0 | 6.4 | 16.0 | 15.5 | 1.8 |
| A10 | knows a lot about government regulations | 331 | 41.4 | 42.3 | 14.6 | 26.3 | 2.9 | 17.5 | 19.7 | 1.2 |
| A11 | has good contacts with the local newspaper, radio or t.v. | 330 | 17.6 | 22.4 | 6.9 | 39.7 | 3.4 | 12.1 | 12.1 | 1.5 |
| A12 | knows a lot about health and fitness | 330 | 57.6 | 42.1 | 13.2 | 38.9 | 5.3 | 11.6 | 11.6 | 1.5 |
| A13 | knows a lot about DIY | 332 | 83.1 | 58.0 | 15.2 | 35.1 | 8.3 | 5.8 | 9.4 | 0.9 |
| | **Do you currently know anyone who would…?** | | | | | | | | | |
| B1 | give you sound advice about money problems | 330 | 70.3 | 48.7 | 9.5 | 30.6 | 2.2 | 10.8 | 22.4 | 1.5 |
| B2 | give you sound advice on problems at work | 311 | 67.9 | 41.2 | 11.4 | 39.8 | 1.4 | 41.2 | 6.2 | 7.2 |
| B3 | help you to move or dispose of bulky items | 330 | 79.7 | 52.9 | 14.4 | 39.2 | 14.4 | 6.8 | 8.0 | 1.5 |
| B4 | help you with small jobs around the house | 331 | 87.9 | 69.1 | 13.7 | 33.7 | 9.6 | 1.4 | 4.5 | 1.2 |
| B5 | do your shopping if you are ill | 332 | 94.3 | 77.6 | 8.9 | 32.9 | 14.1 | 2.2 | 1.3 | 0.9 |
| B6 | lend you a small amount of money | 329 | 89.4 | 79.9 | 20.4 | 48.6 | 15.5 | 14.9 | 4.3 | 1.8 |
| B7 | give you careers advice | 316 | 51.3 | 47.5 | 11.1 | 39.5 | 0.6 | 38.3 | 9.9 | 5.7 |
| B8 | discuss politics with you | 332 | 61.1 | 60.6 | 21.2 | 49.8 | 4.9 | 18.2 | 9.4 | 0.9 |
| B9 | give you sound legal advice | 332 | 49.4 | 26.8 | 10.4 | 39.0 | 1.2 | 14.0 | 23.8 | 0.9 |
| B10 | give you a good reference for a job | 314 | 83.8 | 17.1 | 10.3 | 52.1 | 12.2 | 57.0 | 15.2 | 6.3 |
| B11 | get you cheap goods or 'bargains' | 330 | 44.6 | 51.0 | 22.4 | 47.6 | 8.2 | 10.2 | 15.0 | 1.5 |
| B12 | help you to find somewhere to live if you had to move home | 329 | 66.6 | 74.9 | 26.5 | 39.7 | 3.7 | 6.4 | 3.2 | 1.8 |
| B13 | lend you a large amount of money | 324 | 42.6 | 82.6 | 16.7 | 18.1 | 0.7 | 0.7 | 1.4 | 3.3 |
| B14 | look after your home or pets if you go away | 328 | 86.0 | 63.8 | 16.0 | 40.8 | 35.5 | 1.8 | 3.2 | 2.1 |

Only one resource was accessible to more than 90% of respondents (B5: can do your shopping if you are ill), suggesting that ceiling effects were minimal. The other popular items were common social resources such as lending a small amount of money (B6), help with small jobs around the house (B4) or looking after your home or pets if you go away (B14) (table 4.23). Also, only 17.6% of respondents had access to someone with good contacts with the local newspaper, t.v. or radio (A11). However, this was not too low to cause concern about floor effects in the instrument. Other rare resources included a local councillor (A7) or someone who worked for the local council (A8).

### 4.4.7.2   Missing data

The adjustments made to the RG-UK following the first pilot did not significantly reduce the amount of missing data. There remained an average of 0.6 missing items per respondent. However, proportionately fewer respondents missed at least one item (17.3%vs.29.5%), meaning that data from a higher proportion of respondents was available for sub-scale analysis. Also, the missing data was largely evenly spread across all 27 items and was below 5% for all except three items (table 4.23).

The three items that were not completed by the highest number of people (B2, B7 and B10) were related to employment and had previously attracted some missing data. The respondents who did not complete these items were predominantly retired, with one person looking after the home and one unemployed. One employed respondent who did not complete any of them also failed to complete any of the RG-UK. The only other respondent who failed to complete one of these items (B7) was a 'senior supervisor' aged 62. It was possible that he was nearing retirement and did not think it was relevant for him to have access to someone who could provide careers advice. In most of these cases, it was likely that the respondents left the item blank because they did not consider it relevant for their current circumstances, suggesting that the instructions needed to be made clearer.

As in the first pilot we checked for potential bias caused by missing data by examining whether the respondents who did not answer at least one item (n=58) were significantly different from those who provided full data (n=277). Respondents who did not answer at least one item were older than those who provided full data, and were more likely to be widowed or not employed (Appendix C, table C34). There were no significant differences according to gender, ethnicity, borough, GHQ score (Goldberg and Williams, 1988) or which mailing respondents replied to (Appendix C, table C34).

However, in a multivariate logistic regression model (not reported), none of the variables maintained independent relationships with missing at least one item. This suggested that age, marital status and employment status interacted so that respondents did not systematically omit questionnaire items according to any one of the demographic variables that we measured.

### 4.4.7.3   RG-UK scale

Respondents to the second pilot had access to an average of 17.24 social resources (95%CI=16.54-17.93) on the RG-UK scale. Most were accessible through kin ties, though rarer resources were more frequently accessed through non-kin ties (table 4.23). The scale was approximately normally distributed, with a slight negative skew (figure 4.1). Mean access to resources did not vary according to electoral ward, gender, or marital status. There was also no difference according to which mailing respondents replied to. This may suggest that non-responders did not have significantly different access to resources than responders, but we did not have the data to confirm this. However, respondents' age had a slight curvilinear relationship with RG-UK scores and varied according to ethnic group ($F_{(4,269)}=0.75$, $p=0.029$). There also appeared to be a social class gradient in access to social resources ($F_{(8,265)}=6.36$, $p<0.0001$). Respondents in higher SOC groups had access to more social resources than retired people, for example.

**Figure 4.1        Histogram of RG-UK scale**
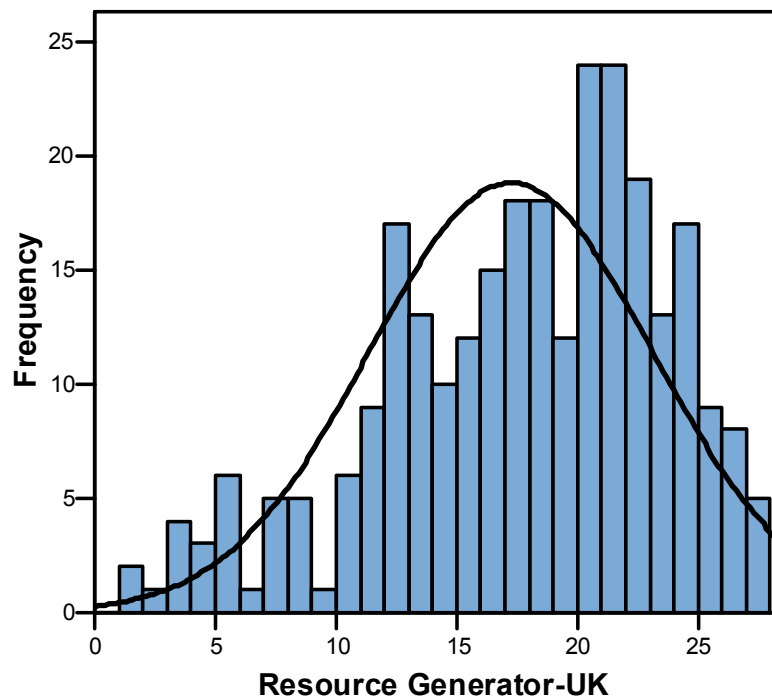
Increasing age, ethnicity, not being in paid work and a likely presence of common mental disorder were all associated with having access to fewer RG-UK resources in the multivariate linear regression model (table 4.24).

**Table 4.24    RG-UK scale linear regression**

| Variable | Beta | p |
|---|---|---|
| Age>69[a] | -0.45 | <0.001 |
| Age 60-69[a] | -0.41 | <0.001 |
| Age 50-59[a] | -0.34 | <0.001 |
| Age 40-49[a] | -0.24 | 0.005 |
| 'Other' ethnicity[b] | -0.19 | 0.001 |
| GHQ case[c] | -0.16 | 0.005 |
| Black ethnicity[b] | -0.15 | 0.010 |
| Student[d] | -0.14 | 0.023 |
| Unemployed[d] | -0.13 | 0.025 |

$R^2_{adj}$=0.229, F(11,236)=7.67, p<0.0001
[a]Contrast group=Age<30
[b]Contrast group=White ethnicity
[c]Contrast group=GHQ non-case (scoring<4)
[d]Contrast group=SOC groups 1-3

### 4.4.7.4   RG-UK domestic resources sub-scale

Respondents had access to a mean of 4.89 (95%CI=4.68-5.10) social resources of the seven in the domestic resources sub-scale. As in the RG-UK scale, the sample mean for the scale did not vary according to electoral ward, gender, marital status or mailing. There was also a decline in access to resources with increasing age. The domestic resources sub-scale score also varied according to ethnic group (F(4,309)=4.88, p<0.001). The social class gradient was only evident in the univariate analysis for this scale (F(8,305)=2.50, p=0.012). In the multivariate linear regression, age remained a prominent correlate of access to domestic resources, and it was joined by ethnicity and likely presence of a common mental disorder (table 4.25).

### 4.4.7.5   RG-UK expert advice sub-scale

Of the nine resources that constituted the expert advice sub scale, respondents had access to a mean of 5.25 (95%CI=4.97-5.53). The socio-demographic variables appeared to play a slightly different role for expert advice than domestic resources. While there was no difference according to mailing, gender, marital status, ethnic group

or being a GHQ case, there was a difference between electoral wards (F(3,295)=4.48, p=0.004) with respondents from Torne Valley having access to an average of 1.4 more resources than Armthorpe (p=0.003). However, age and socioeconomic status had the strongest relationship with access to expert advice (table 4.26).

**Table 4.25**        **RG-UK domestic resources sub-scale linear regression**

| Variable | Beta | p |
|---|---|---|
| Age>69[a] | -0.33 | <0.001 |
| Age 50-59 [a] | -0.28 | <0.001 |
| 'Other' ethnicity[b] | -0.23 | <0.001 |
| Age 60-69[a] | -0.20 | 0.001 |
| Black ethnicity[b] | -0.16 | 0.003 |
| GHQ case[c] | -0.16 | 0.005 |
| Age 40-49 [a] | -0.15 | 0.019 |

$R^2_{adj}$=0.182, F(7,277)=10.00, p<0.0001
[a]Contrast group=Age<30
[b]Contrast group=White ethnicity
[c]Contrast group=GHQ non-case (scoring<4)

**Table 4.26**        **RG-UK expert advice sub-scale linear regression**

| Variable | Beta | p |
|---|---|---|
| Age 60-69[a] | -0.26 | 0.004 |
| Age>69[a] | -0.25 | 0.002 |
| Retired[b] | -0.22 | 0.031 |
| Student[b] | -0.21 | 0.001 |
| Age 50-59[a] | -0.17 | 0.015 |
| SOC groups 7-9[b] | -0.17 | 0.006 |
| Armthorpe ward[c] | -0.17 | 0.004 |
| Age 40-49[a] | -0.15 | 0.029 |
| Unemployed[b] | -0.15 | 0.012 |
| Home-maker[b] | -0.14 | 0.019 |
| Disabled[b] | -0.12 | 0.045 |

$R^2_{adj}$=0.210, F(13,252)=6.41, p<0.0001
[a]Contrast group=Age<30
[b]Contrast group=SOC groups 1-3
[c]Contrast group= Torne valley ward (largest mean)

### 4.4.7.6   RG-UK personal skills sub-scale

Respondents had access to an average of 3.66 (95%CI=3.48-3.84) resources in the personal skills sub-scale. Access to personal skills resources varied according to electoral ward (F(3,315)=6.14, p<0.0001), with respondents from Selhurst having

access to a mean of only 2.98 resources in contrast to 3.91 from Armthorpe (p=0.004) and 4.05 from Torne Valley (p=0.001). It also varied according to the ethnic origin of respondents (F(4,311)=5.12, p=0.0005). Unemployed respondents had access to fewer personal skills resources on average than each of the groups of employed respondents (F(8,307)=3.87, p=0.0002). Increasing age and being a GHQ case were associated with access to personal skills in the multivariate linear regression model alongside these variables (table 4.27).

Table 4.27    RG-UK personal skills sub-scale linear regression

| Variable | Beta | p |
|---|---|---|
| Unemployed[a] | -0.20 | <0.001 |
| Age>69[b] | -0.19 | 0.001 |
| Age 60-69[b] | -0.17 | 0.003 |
| 'Other' ethnicity[c] | -0.16 | 0.004 |
| Selhurst ward[d] | -0.14 | 0.042 |
| GHQ case[e] | -0.13 | 0.016 |

$R^2_{adj}$=0.168, F(9,275)=7.37, p<0.0001
[a]Contrast group=SOC groups 1-3
[b]Contrast group=Age<30
[c]Contrast group=White ethnicity
[d]Contrast group=Torne valley ward (largest mean)
[e]Contrast group=GHQ non-case (scoring<4)

### 4.4.7.7   RG-UK problem solving resources sub-scale

Respondents to the second pilot had access to an average of 3.33 (95%CI=3.21-3.44) problem solving resources. There was no difference in mean scores according to which mailing respondents replied to, gender, marital status, ethnic group or being a GHQ case. Occupational group was a significant correlate of problem solving resources (F(8,307)=5.10, p<0.0001). In particular, unemployed and retired respondents, and those unable to work due to disability or a health problem, had less access to resources within this domain than respondents in the highest occupational group. Age and electoral ward joined socioeconomic status as covariates in the multivariate linear regression model (table 4.28).

**Table 4.28      RG-UK problem solving resources sub-scale linear regression**

| Variable | Beta | p |
|---|---|---|
| Age 60-69[a] | -0.26 | <0.001 |
| Age>69[a] | -0.21 | <0.001 |
| Unemployed[b] | -0.19 | 0.001 |
| Disabled[b] | -0.16 | 0.003 |
| Selhurst ward[c] | -0.16 | 0.016 |
| Ashburton ward[c] | -0.15 | 0.032 |
| Age 50-59[a] | -0.14 | 0.020 |
| Armthorpe ward[c] | -0.14 | 0.040 |

$R^2_{adj}$=0.139, $F_{(9,277)}$=6.13, p<0.0001
[a]Contrast group= Age<30
[b]Contrast group=SOC groups 1-3
[c]Contrast group=Torne Valley ward (largest mean)

### 4.4.7.8   RG-UK human capital scale

We asked respondents in the RG-UK if they personally possessed the first 13 skills or resources in the instrument because they would be less likely to ask anyone else for these if they did. The resulting scale can be used to control for this in multivariate analyses.

In our sample respondents personally possessed a mean of 3.16 (95%CI=2.91-3.40) resources. Unlike the social capital sub-scales, this scale varied by gender with men possessing a mean difference of 1.46 (95%CI=1.00-1.93) more resources than women (t(313)=6.16, p<0.0001). This difference persisted in the linear regression model for the scale (table 4.29). Having access to more expert advice or personal skills from network members was associated with more human capital, whereas lower socioeconomic status was associated with less (table 4.29).

**Table 4.29      RG-UK human capital scale linear regression**

| Variable | Beta | p |
|---|---|---|
| Gender[a] | 0.32 | <0.001 |
| Expert advice sub-scale | 0.29 | <0.001 |
| Personal skills sub-scale | 0.23 | <0.001 |
| SOC 7-9[b] | -0.13 | 0.002 |
| Student[b] | -0.12 | 0.001 |
| 'Other' employment[b] | 0.12 | 0.031 |

$R^2_{adj}$=0.12, $F_{(8,278)}$=6.79, p<0.0001
[a]Contrast group=Female
[b]Contrast group=SOC groups 1-3

### 4.4.7.9  RG-UK scale correlations

The main scale for the RG-UK had a very strong positive correlation with its four sub-scales (table 4.30). It can therefore be used as a good summary measure for the instrument as a whole. However, the inter-scale correlations were only moderate, suggesting that they each represent different sub-collections of social resources that can be accessed through social networks. When the RG-UK is used in studies as an independent variable, it is possible that the sub-scales may be useful in explaining some of the variance in the dependent variable.

**Table 4.30        Correlation matrix of RG-UK sub-scales**

|  | RG-UK scale | Domestic resources | Expert advice | Personal skills | Problem solving |
|---|---|---|---|---|---|
| **RG-UK scale** | 1 | | | | |
| **Domestic** | 0.84* | 1 | | | |
| **Expert advice** | 0.87* | 0.58* | 1 | | |
| **Personal skills** | 0.81* | 0.61* | 0.55* | 1 | |
| **Problem solving** | 0.72* | 0.51* | 0.58* | 0.46* | 1 |

*$p<0.0001$

### 4.4.8    Phase 2 piloting – PG-UK population norms

### 4.4.8.1   Item endorsement frequencies

The item endorsement frequencies of the occupations in the Position Generator-UK were very similar to the first pilot (see section 4.4.5.1). The range of 8.4% (Member of Parliament) to 67.2% (school teacher) is almost identical, with the same occupations at the top and bottom of the distribution (table 4.31). This similarity suggests that removing the 'professional only' column has had a minimal impact on item popularities. However, we can be more confident that respondents personally know the people with the occupations in the questionnaire. The range of item popularities also suggests that there are no floor or ceiling effects for any of the individual occupations.

**Table 4.31    PG-UK β item endorsement frequencies and missing data**

| Do you know a / an…? | Prestige score | 'Yes' n=335 (%) | Missing n=335 (%) |
|---|---|---|---|
| 15 … School teacher | 307 | 225 (67.2) | 2 (0.6) |
| 17 … Builder | 140 | 219 (65.4) | 0 |
| 1 … Sales assistant | 58 | 210 (62.7) | 3 (0.9) |
| 18 … Nurse | 204 | 208 (62.1) | 2 (0.6) |
| 5 … Secretary | 116 | 194 (57.9) | 5 (1.5) |
| 16 … Accountant | 303 | 176 (52.5) | 5 (1.5) |
| 3 … Gardener | 147 | 157 (46.9) | 4 (1.2) |
| 10 … Solicitor | 315 | 142 (42.4) | 3 (0.9) |
| 13 … Police constable | 201 | 140 (41.8) | 4 (1.2) |
| 2 … Factory worker | 9 | 126 (37.6) | 6 (1.8) |
| 9 … Small farmer | 147 | 91 (27.2) | 3 (0.9) |
| 20 … Call centre operator | 56 | 90 (26.9) | 4 (1.2) |
| 12 … Butcher | 137 | 88 (26.3) | 2 (0.6) |
| 6 … Travel agent | 76 | 86 (25.7) | 3 (0.9) |
| 8 … Estate agent | 194 | 80 (23.9) | 3 (0.9) |
| 7 … University professor | 308 | 65 (19.4) | 5 (1.5) |
| 14 … Street trader | 58 | 48 (14.3) | 4 (1.2) |
| 11 … Journalist | 197 | 44 (13.1) | 3 (0.9) |
| 19 … Undertaker | 74 | 40 (11.9) | 3 (0.9) |
| 4 … Member of Parliament | 356 | 28 (8.4) | 5 (1.5) |

### 4.4.8.2    Missing data

There was even less missing data in the second pilot than in the first. Respondents did not complete an average of 0.22 occupations, half as many as in the first pilot. Only 21 (6.3%) respondents did not complete at least one occupation. Of these, only three (0.9%) omitted more than two occupations. This suggests that the list of 20 occupations for the PG-UK is acceptable and the shorter list both minimizes respondent burden and reduces missing data. The missing data was distributed through all 20 occupations with none having more than 2% missing (table 4.31).

There were no differences between the 21 respondents who missed at least one item and those who provided full data according to electoral ward, mailing, gender, marital status, ethnicity, occupational group or GHQ score. However, they were a mean of 9.96 (95%CI=2.59-17.33) years older than those who completed all PG-UK items (t(303)=2.66, p<0.01). This suggests that missing data may be a result of increasing age, possibly caused by some respondents not considering it necessary to tick the 'no' box if they don't know anyone with a particular occupation or simply because of

respondent burden. As we only had the postal address of respondents it was not feasible to determine the reasons for missing data within existing resources.

### 4.4.8.3   PG-UK scale

The position generator methodology has been used in a number of different ways to derive different measures of access to occupational prestige. The three main measures are the difference between the highest and lowest occupational statuses accessed (PGrange), the highest occupational status accessed (PGmax) and the number of different occupations accessed (PGtotal) (Lai et al., 1998; Lin and Dumin, 1986).

The first measure (PGrange) captures the diversity of resources accessible within a respondent's network (Campbell et al., 1986). It is calculated by subtracting the smallest prestige score accessed from the largest.

The second measure (PGmax) indicates the 'best' possible social resources that are available to a respondent. Social resources theory suggests that one takes advantage of the 'better' resources that are embedded in one's network and these are often obtained from people in higher status occupations (Lin, 1982). The PGmax scale consists of the highest prestige score accessed by a respondent.

Finally, the third measure (PGtotal) is often used in position generator studies (e.g. Erickson, 2004), as it is intuitively appealing and relatively straightforward to calculate. PGtotal is simply the total number of occupations accessible to a respondent from within their network. An additional measure (PGvol) could also be constructed from position generator data. This can be calculated by summing all the prestige scores of the occupations accessible to a respondent. PGvol is an alternative measure of the volume of accessed prestige.

Position generator studies have found strong correlations between these measures. For example, Lai et al (1998) found a strong correlation between PGrange and PGmax in their New York sample. In our sample, all four measures were highly positively correlated (table 4.32). In particular, PGvol and PGtotal had almost a perfect correlation and it would add nothing to a study to use both measures together. If we were using the Position Generator-UK as an explanatory tool, then we may consider using three of the measures to explore their contribution to the variance of an outcome measure. However, as we were establishing population norms for the whole scale and

the four sub-scales we used only one of these four measures for this purpose. The best candidate was PGtotal as it had an approximately normal distribution (figure 4.2), unlike PGmax and PGrange that both had significant negative skews (not shown). Using PGtotal will facilitate comparison with other studies that have used the same measure.

Table 4.32        Correlation matrix of PG-UK measures

|         | PGtotal | PGmax | PGrange | PGvol |
|---------|---------|-------|---------|-------|
| **PGtotal** | 1 |  |  |  |
| **PGmax** | 0.59* | 1 |  |  |
| **PGrange** | 0.72* | 0.79* | 1 |  |
| **PGvol** | 0.96* | 0.65* | 0.68* | 1 |

*p<0.0001

Figure 4.2        Histogram of PG-UK scale (PGtotal)
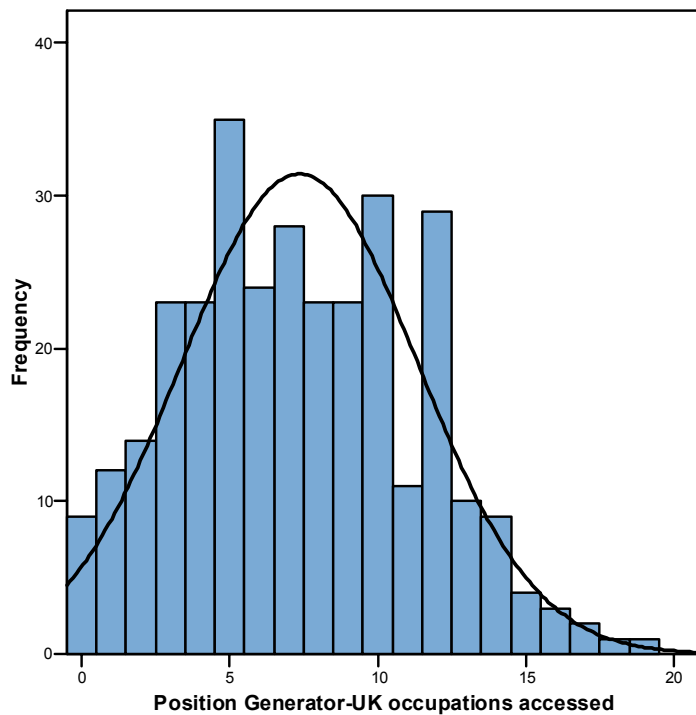


The PGtotal scale was a good summary measure of volume and diversity of occupational prestige accessible. For respondents to score highly on this measure they needed to know people with both high and low occupational prestige, as the 20 occupations in the measure represented the broad spectrum of jobs found in the UK. In contrast to the RG-UK, the distribution had a slight positive skew, indicating that the

occupations were rarer than the RG-UK resources in this population. In this sample, the mean number of occupations accessible was 7.36 (95%CI=6.92-7.80).

There were a number of systematic differences in the data. Firstly, respondents in Doncaster had access to a mean of 1.69 (95%CI=0.82-2.56) more occupations than respondents from Croydon (t(312)=3.84, p<0.001). Respondents in Torne Valley had access to the most. Although there was no linear correlation between age and PG-UK total score, there was a difference by age category with respondents aged 60-69 having access to fewer occupations than those aged 40-49 and 50-59 (F(5,279)=2.95, p=0.013). However the difference did not persist for those aged over 69. Respondents who replied to the second mailing had access to a mean of 1.38 fewer occupations than the first, but those responding only to the third mailing did not have access to significantly fewer. There was a social class gradient in access to occupations with those from higher occupational groups having access to more occupations (F(8,302)=3.39, p=0.001). Unemployed respondents were particularly disadvantaged. Finally, there was a negative correlation with GHQ score (r=-0.14, p=0.014). In particular, respondents above the thresholds (both 3 and 4) for probable common mental disorders had access to significantly fewer occupations. The only variables not related to PGtotal were gender, marital status and ethnicity.

**Table 4.33      PG-UK scale linear regression**

| Variable | Beta | p |
|---|---|---|
| Ashburton ward[a] | -0.28 | <0.001 |
| Selhurst ward[a] | -0.27 | <0.001 |
| Age 60-69[b] | -0.24 | <0.001 |
| Armthorpe ward[a] | -0.20 | 0.007 |
| Unemployed[c] | -0.16 | 0.001 |
| GHQ score | -0.14 | 0.009 |
| Asian ethnicity[d] | 0.08 | 0.008 |
| 'Other' ethnicity[d] | -0.07 | 0.010 |

$R^2$=0.208, F(11,268)=8.98, p<0.0001
[a]Contrast group=Torne Valley ward (largest mean)
[b]Contrast group=Age under 30
[c]Contrast group=SOC groups 1-3
[d]Contrast group=White ethnicity

In the linear regression model for this scale (table 4.33) location appeared to be very important as three of the electoral wards (in comparison with the fourth) made a significant contribution to the scale variance. Being aged between 60 and 69, having a

higher GHQ score and being unemployed were also important explanatory variables. Ethnicity also made a small contribution to the variance of the scale.

### 4.4.8.4 PG-UK professional occupations sub-scale

Of the six occupations in the sub-scale, respondents had access to a mean of 2.06 (95%CI=1.90-2.22). The socio-demographic variables had a similar relationship with the sub-scale than the PG-UK scale as a whole. Respondents in Torne Valley had access to more people with occupations in this scale than those from the other areas $(F_{(3,321)}=7.78, p<0.0001)$. Respondents to the second mailing had access to fewer occupations in this sub-scale than the first, but the same was not true for those who responded even later. There was also a difference according to occupational grouping with unemployed respondents knowing fewer than those employed $(F_{(8,313)}=3.40, p=0.0009)$. However, there were no differences by gender, age, marital status, ethnicity or GHQ score.

The linear regression model (table 4.34) was very similar to the PGtotal scale. However, respondents from both Asian and black ethnic groups had more professional contacts than white respondents. The other main difference was that GHQ score was dropped from this model.

**Table 4.34**      **PG-UK professional occupations sub-scale linear regression**

| Variable | Beta | p |
|---|---|---|
| Armthorpe ward[a] | -0.30 | <0.001 |
| Ashburton ward[a] | -0.26 | <0.001 |
| Selhurst ward[a] | -0.22 | 0.006 |
| Age 60-69[b] | -0.17 | 0.001 |
| Unemployed[c] | -0.17 | 0.009 |
| Asian ethnicity[d] | 0.17 | 0.009 |
| Black ethnicity[d] | 0.13 | 0.033 |
| Second mailing[e] | -0.11 | 0.045 |

$R^2$=0.177, $F_{(9,280)}$=6.87, p<0.0001
[a]Contrast group=Torne Valley ward (largest mean)
[b]Contrast group=Age under 30
[c]Contrast group=SOC groups 1-3
[d]Contrast group=White ethnicity
[e]Contrast group=First mailing

**4.4.8.5   PG-UK skilled occupations sub-scale**

The mean for this five occupation scale is 1.88 (95%CI=1.74-2.03). Although there was no linear correlation with age, there was a difference by age group with those aged between 60 and 69 having access to fewer skilled occupations than those in the two decades immediately younger than them (F(5,291)=3.12, p=0.009). Unemployed and retired respondents had access to fewer skilled occupations than those in employment (F(8,314)=4.02, p=0.0001) and there was a negative correlation with GHQ score (r=-0.16, p=0.004). There was no difference by electoral ward, mailing, gender, marital status or ethnicity.

The linear regression model could explain only 11.2% of the scale variance and included few variables at the p<0.05 level (table 4.35).

**Table 4.35        Skilled occupations sub-scale linear regression**

| Variable | Beta | p |
|---|---|---|
| Retired[a] | -0.19 | 0.001 |
| Unemployed[a] | -0.16 | <0.001 |
| GHQ score | -0.16 | 0.001 |
| 'Other' ethnicity[b] | -0.06 | 0.001 |

$R^2$=0.112, F(5,286)=13.14, p<0.0001
[a]Contrast group=SOC groups 1-3
[b]Contrast group=White ethnicity

**4.4.8.6   PG-UK low-skilled occupations sub-scale**

As there were only three occupations in this sub-scale, it did not perform very well as a continuous variable. The sample mean was 1.29 (95%CI=1.19-1.39) occupations, but this differed according to electoral ward (F(3,323)=21.33, p<0.0001). The scale had a negative correlation with age (r=-0.26, p<0.0001). There was a difference according to ethnic group, with people of white ethnicity having access to more occupations (F(4,319)=3.45, p=0.009). Also, retired respondents had access to fewer low-skilled occupations than those in employment (F(8,315)=2.75, p=0.006). There were no differences according to which mailing respondents replied to, their gender, marital status or GHQ score.

The linear regression model was quite different for this scale due to its focus on lower status occupations (table 4.36). People who were employed in low skilled occupations

and those who did not state their occupation knew more people in this scale than those in higher status occupations. However, respondents from Croydon knew fewer from this group of occupations than those from Doncaster.

**Table 4.36    PG-UK low skilled occupations sub-scale linear regression**

| Variable | Beta | P |
|---|---|---|
| Ashburton ward[a] | -0.34 | <0.001 |
| Selhurst ward[a] | -0.33 | <0.001 |
| Age | -0.27 | <0.001 |
| 'Other' employed[b] | 0.12 | 0.012 |
| SOC 7-9[b] | 0.11 | 0.042 |

$R^2$=0.281, F(9,282)=13.94, p<0.0001
[a]Contrast group=Armthorpe ward (largest mean)
[b]Contrast group= SOC groups 1-3

### 4.4.8.7   PG-UK food chain occupations sub-scale

As with the previous scale, there were only three occupations in this scale and similar caution needs to be exercised in the interpretation of the following results. Respondents had access to a mean of 1.01 (95%CI=0.90-1.12) occupations in this scale. There was a significant difference between electoral wards with respondents from Torne Valley knowing the least (F(3,327)=22.70, p<0.0001). Respondents to the second mailing again knew fewer than the first (F(2,328)=4.35, p=0.014), and respondents of black ethnicity knew fewer than white respondents (F(4,323)=3.66, p=0.006). Unlike the other scales, though, there was a difference by marital status with widowed respondents knowing more within this sub-scale than single or married people (F(3,322)=4.45, p=0.004). There was no difference by gender, age, occupational grouping or GHQ score.

The regression model indicated that the geographical location of respondents had an important role in determining access to occupations in this sub-scale (table 4.37). Torne Valley was the most common place to know someone in a 'food chain' occupation, possibly because of its rural locality. Also, this is the first time that marital status entered the model and age was not included.

Table 4.37        PG-UK food chain occupations sub-scale linear regression

| Variable | Beta | p |
|----------|------|---|
| Ashburton ward[a] | -0.43 | <0.001 |
| Selhurst ward[a] | -0.34 | <0.001 |
| Armthorpe ward[a] | -0.32 | <0.001 |
| Widowed[b] | 0.13 | 0.041 |
| Black ethnicity[c] | -0.11 | 0.012 |
| Second mailing[d] | -0.11 | 0.025 |
| Unemployed[e] | -0.06 | 0.028 |
| Other ethnicity[c] | -0.05 | 0.049 |

$R^2$=0.241, F(9,286)=12.44, p<0.0001
[a]Contrast group=Torne Valley ward (largest mean)
[b]Contrast group=Single
[c]Contrast group=White ethnicity
[d]Contrast group= First mailing
[e]Contrast group= SOC groups 1-3

## 4.4.8.8   PG–UK scale correlations

The main scale for the PG-UK (PGtotal) had a strong positive correlation with all the sub-scales (table 4.38), operating as a good summary measure for the scale. However, although the sub-scales had positive inter-scale correlations, these are weaker than with the main scale and justify their use in studies with the PG-UK as an independent variable, as they are all measuring slightly different elements of occupational prestige.

Table 4.38        Correlation matrix of PG-UK sub-scales

| | PGtotal | Professional occupations | Skilled occupations | Low skilled occupations | Food chain occupations |
|---|---------|--------------------------|---------------------|-------------------------|------------------------|
| **PGtotal** | 1 | | | | |
| **Professional occupations** | 0.76* | 1 | | | |
| **Skilled occupations** | 0.74* | 0.39* | 1 | | |
| **Low skilled occupations** | 0.63* | 0.30* | 0.36* | 1 | |
| **Food chain occupations** | 0.70* | 0.39* | 0.38* | 0.35* | 1 |

*p<0.0001

**4.4.9    Phase 2 piloting – RG-UK & PG-UK convergence / divergence validity**

The shared variance of the RG-UK and PG-UK was 48%, in contrast to the 8% shared variance of the RG-UK and locus of control (Coleman and DeLeire, 2003). This suggests that the RG-UK and PG-UK measure a similar construct that is distinct from locus of control. Both the RG-UK and PG-UK had weak negative correlations with the GHQ ($r=-0.11$ & $r=-0.14$, $p<0.05$ respectively) in contrast to external locus of control, a known health correlate, which had a stronger association ($r=-0.45$, $p<0.0001$).

**4.4.10   Phase 2 piloting – known-group validity**

**4.4.10.1  RG-UK**

The sample of academics had access to a mean of 19.23 (95%CI=18.11-20.35) resources in the RG-UK scale, 1.99 (95%CI=0.42-3.56) more than the mean of the general population sample ($t(336)=2.50$, $p=0.013$). A significant difference was also found in the expert advice and problem solving resources sub-scales, but not in the domestic resources and personal skills ones (table 4.39).

As the sample of academics were on average younger than the general population, we used linear regression to control for age. Age had an effect as it reduced the mean group difference in the RG-UK scale to 1.48 (95%CI=0.01-2.96) resources, though it remained significant ($p=0.049$). Age had a similar, though less pronounced effect, in the expert advice and problem solving resources sub-scales (table 4.39).

**4.4.10.2  PG-UK**

The sample of academics knew a mean of 8.54 (95%CI=7.86-9.21) occupations from the PG-UK scale, 1.18 (95%CI=0.16-2.20) more occupations than the general population mean ($t(377)=2.27$, $p=0.024$). The largest difference between the groups was in the professional occupations sub-scale where the academics on average knew almost twice as many of the occupations as the general population sample (table 4.40). There was a smaller difference in the low-skilled occupations sub-scale, but the academics knew fewer than the general population. There were no differences in the skilled and food chain occupations sub-scales. Controlling for the effect of age had little effect on these differences with academics still knowing 1.12 (95%CI=0.09-2.15) more occupations than the general population mean (table 4.40).

**Table 4.39    RG-UK known group validity test**

| Scale | Academics Mean (95%CI) (n=65) | General population Mean (95%CI) (n=335) | Difference in means (95%CI) | t-test | Difference in means after controlling for age (95%CI) |
|---|---|---|---|---|---|
| RG-UK | 19.23 (18.11 to 20.35) | 17.24 (16.54 to 17.93) | 1.99 (0.42 to 3.56) | t(336)=2.50, p=0.013 | 1.48 (0.01 to 2.96) |
| Domestic resources | 4.87 (4.43 to 5.32) | 4.89 (4.68 to 5.10) | -0.02 (-0.52 to 0.48) | ns | ns |
| Expert advice | 7.00 (6.59 to 7.41) | 5.25 (4.97 to 5.53) | 1.75 (1.12 to 2.38) | t(362)=5.45, p<0.0001 | 1.53 (0.93 to 2.13) |
| Personal skills | 3.43 (3.08 to 3.78) | 3.66 (3.48 to 3.84) | -0.23 (-0.67 to 0.21) | ns | ns |
| Problem solving | 3.98 (3.77 to 4.20) | 3.33 (3.21 to 3.44) | 0.66 ((0.38 to 0.94) | t(382)=4.68, p<0.0001 | 0.58 (0.31 to 0.86) |

**Table 4.40    PG-UK known group validity test**

| Scale | Academics Mean (95%CI) (n=65) | General population Mean (95%CI) (n=335) | Difference in means (95%CI) | t-test | Difference in means after controlling for age (95%CI) |
|---|---|---|---|---|---|
| PG-UK | 8.54 (7.86 to 9.21) | 7.36 (6.92 to 7.80) | 1.18 (0.16 to 2.20) | t(377)=2.27, p=0.024 | 1.12 (0.09 to 2.15) |
| Professional occupations | 4.05 (3.73 to 4.36) | 2.06 (1.90 to 2.22) | 1.99 (1.60 to 2.37) | t(388)=10.16, p<0.0001 | 1.93 (1.54 to 2.32) |
| Skilled occupations | 1.98 (1.78 to 2.19) | 1.88 (1.74 to 2.03) | 0.10 (-0.23 to 0.43) | ns | ns |
| Low-skilled occupations | 0.52 (0.34 to 0.71) | 1.29 (1.19 to 1.39) | -0.77 (-1.02 to -0.52) | t(390)=-6.09, p<0.0001 | -0.81 (-1.05 to -0.56) |
| Food chain occupations | 0.78 (0.60 to 0.97) | 1.01 (0.90 to 1.12) | -0.23 (-0.49 to 0.03) | ns | ns |

## 4.5 Discussion

### 4.5.1 Methodological limitations

In respect of these results there are a number of limitations that need to be considered. Firstly, the pre-testing involved a small focus group study of only 22 participants. If it were larger with more groups, there would be greater capacity for confirmation or refutation of our findings. It is possible that having more participants would produce a greater diversity of opinions and more suggestions for items to include in the instruments. For example, we could have recruited more participants in London from black ethnic groups or women aged over 60 to increase the heterogeneity of the groups. However, although the final group generated some new ideas, it also repeated many of the discussions that had already been held. Further groups may not have generated sufficient new ideas about the instruments to make them worthwhile. We found no substantial differences in opinions between the groups held in London and those held in Doncaster. This may have been caused by our sampling strategy and a lack of diversity in and between the groups. It is equally possible, though, that this was caused by our small sample in which we would have been unable to detect anything but large differences.

It is possible that selection bias influenced the outcome of the panel discussions and ratings. The author, who chaired the meeting, knew all the members in a professional capacity. It was possible that they were not as critical as they might have been if they had no prior knowledge of him. This was difficult to assess formally, but panel members did not appear diffident in giving their opinions. One member in particular was very critical of the methodology and prior knowledge of the researcher made her no less forthright in her opinions.

The outcome of the cognitive appraisal may have been influenced by response bias. The interviewees were significantly more likely to pay greater attention to the meaning of the questions as they were tape-recorded, asked to speak their thoughts aloud and read out the questions as they went. Respondents who self-complete the questionnaire may not have as much time, or pay as much attention to the guidance, as the participants in the cognitive appraisals. This may lead to response errors or missing data. However, the subsequent field tests did not show this to be a considerable problem.

The use of electoral registers as the sampling frame for the two main pilots under-represented the disenfranchised in our sample. Although electoral reform has extended the right to vote to some disenfranchised groups (Lardy, 2001), homeless people, prisoners or people in long-stay hospitals are less likely to be on the register. It is possible that these groups have less social capital than the general population. However, it is also likely that the edited registers may under-represent people with higher levels of education. People who were more informed, or those who had paid more attention to the notes on the electoral register application form, may have been more likely to take themselves off this register. It is possible that these people had higher social capital than those remaining on the edited register. Therefore it is possible that there is some regression towards the mean as those with both the greatest and least access to social capital are less likely to be included in the sample. This is difficult to assess, of course, as little is known about those who are not included on the edited register.

Low response rates in our two main pilots limit our ability to generalise our findings to the UK population as a whole. In particular, as we lacked data on non-respondents we were unable to determine whether this group had deficits in access to social capital that in some way prejudiced their participation. Also, our relatively small samples limited our ability to comprehensively test the operation of the instrument within different population sub-groups. Further testing using a large representative survey is required to examine the distribution of social resources across population sub-groups. However, the small samples do not necessarily mean low representativeness as they were not significantly different from the local population. Thomas et al (2002) still achieved a sample not significantly different from its reference population in spite of a 17% response rate, for example.

The main limitation in the test-retest study was the variation in delay between test and retest. There was a difference of four weeks between the earliest and latest follow-ups. Although we believe the construct to be stable for up to six weeks, the reliability of the instruments could have been more accurately determined using a consistent time delay. Resource constraints limited our recruitment options and a non-random, relatively small sample was far from ideal. Further research using a larger random sample with a more consistent time gap between completions may be required to confirm the instrument's reliability.

A strict approach to reliability testing would see both instruments lose several items due to their low-moderate kappa values. However, instrument development is a trade off between high reliability coefficients or having an instrument that captures many sub-domains of a construct. As social capital is multi-faceted and difficult to measure, it is arguably appropriate to have a larger instrument capturing a diversity of social resources at the expense of a few poor reliability coefficients. Further, if the process of item reduction had begun with an item pool three-four times larger than we required for the final instrument, we may have been able to rely solely on standard psychometric testing to reduce the pool for us.

### 4.5.2   Strengths of the study

In spite of the modest number of focus group participants, for our purposes of establishing content validity of the instruments through discussion about existing items, our groups were largely successful. The participants voiced concerns about the stem questions, the definitions of network ties and the wording of a number of the items which were all taken into account in the re-drafting of the instruments.

The expert panel members had considerable experience of social research and were able to provide informed opinions on the content of the two questionnaires. The panel consisted of academics of senior lecturer grade and below and it could be argued that its expertise was limited as no one more senior was involved. However, as this approach to the measurement of social capital has not previously been developed in the UK, there were no other sources of expertise to draw upon.

We aimed to make the guidance for the RG-UK and PG-UK as clear as possible to minimise response errors. The cognitive interviews demonstrated that respondents were largely able to complete the questionnaires accurately; having obtained a good understanding of what was required of them. For example, an interviewee who suffered from dyslexia read the instructions and completed the questionnaires correctly without any assistance from the researcher. The need for only a few minor amendments after the cognitive appraisal suggested that the focus groups and expert panel had already resolved many of the problems with the RG-UK and PG-UK.

The rigorous pre-testing of the instruments helped to ensure that they have good reliability and validity. The sub-scales generally have good test-retest reliability, although the RG-UK problem solving resources sub-scale performed poorly in this test.

This scale had the lowest reliability of the RG-UK scales in the first piloting phase, indicating that it needs to be used with some caution. The PG-UK generally has better test-retest reliability than the RG-UK, possibly indicating that it is easier to consistently identify occupations than social resources within one's network. However, these findings need to be confirmed in a larger random sample.

Inter-item correlations for both instruments were low or moderate indicating that multi-collinearity was not a problem. Also, correlations between the sub-scales were moderate, suggesting that they were measuring distinct domains of social capital.

The RG-UK and PG-UK performed as expected in the convergence/divergence validity test and the main scales for the RG-UK and PG-UK varied as expected between the sample of academics and the general population in the known group validity test. Half of the sub-scales in the two instruments also varied as expected, demonstrating their validity. There was no difference in the domestic and personal skills sub-scales of the RG-UK and in the skilled and food chain occupations in the PG-UK in this test. It may not be reasonable to expect academics to score higher in these sub-scales, as they may not have the opportunity to develop the necessary contacts. It may be worthwhile to test the validity of these sub-scales using a different sub-group.

### 4.5.3    Discussion of findings

In the early piloting phases of these instruments we were unable to find a satisfactory solution for how to deal with inapplicable items. We decided not to include a 'not applicable' column as this could lead to difficulties in interpreting the results. On the one hand, respondents may mark this column if they do have access to a resource but do not need it at present. For example, someone who is currently self-employed and does not want to change jobs may not need someone to provide advice on problems at work, give careers advice or a reference. However, their situation may change at any time giving rise to the need for one or more of these resources. On the other hand, a respondent who is retired may also mark 'not applicable' to these three items as they are out of the job market and do not need to access these resources. In both these situations a tick in a 'not applicable' column would not indicate *potential* access, which we are trying to capture in these instruments. Instead, we emphasised in the guidance throughout the questionnaire that respondents should answer each item whether it was currently applicable or not.

The lower average item endorsement frequencies for our samples may reflect the smaller and more homogenous population in The Netherlands where respondents may be more likely to have connections with people providing a multitude of resources. Equally, though, it may merely indicate that our respondents have smaller networks or access to fewer resources than the Dutch general population. It is equally possible that the exclusion of social support items from our instrument artificially reduced the item endorsement frequencies. However, any comparison with van der Gaag and Snijders' (2005) study is limited by our small sample and the different modes of administration. While other studies indicate that interviewer-administered and self-complete questionnaires do not produce significantly different results (e.g. Fowler and Gallagher, 1999; Wu et al., 1997) further methodological testing of potential context effects is required.

In our regression models for the RG-UK scale, and the domestic resources and personal skills sub-scales, having a probable common mental disorder was independently associated with having access to fewer resources. This confirms the findings of Ziersch (2005), Song and Lin (in press) and Song (2007). It also relates to De Silva et al's (2005) findings of an inverse relationship between individual social capital and common mental disorder. Speculative hypotheses about these cross-sectional associations include an absolutely low level of resources acting as a vulnerability factor in the development of depression. Also, the loss of previously accessible and valued resources may increase vulnerability or act as a trigger for an episode. It is also possible that access to resources may diminish as common mental disorders persist, possibly as a result of diminished social networks through social withdrawal.

The strongest predictor of access to resources in the RG-UK was age (table 4.24). The slight curvilinear association did not follow an inverse U curve as in other studies of Western societies (Lin, 1999b). Black and 'other' ethnic minority respondents had access to fewer resources as in other studies (Lin, 1999b). Further, respondents not in paid work had access to fewer resources across all the domains except for domestic resources. However, larger samples are required for more definitive results and the instrument needs testing in a representative general population survey to enable full comparisons with other surveys such as the SSND (van der Gaag and Snijders, 2005).

The PG-UK measures a slightly different construct than the RG-UK and this is reflected in the different explanatory models for its scales. For example, location appears to play

a significant role in all the scales except for the skilled occupations sub-scale, whereas it only appeared in one of the RG-UK scales. This may reflect the occupational structure in the areas we sampled and is most evident for the food chain occupations sub-scale where Torne Valley respondents scored much higher than those from the other areas. As Torne Valley is largely a rural area, this is perhaps not surprising. However, they also scored highly on other scales, suggesting that rural networks differ from their urban counterparts. This merits further investigation.

A slight curvilinear relationship with age was also apparent in the PG-UK scales. In particular, respondents aged between 60 and 69 knew fewer occupations than younger respondents. This finding is likely to be because many respondents of this age were not working and their peer networks may also be retired. This difference did not persist for respondents aged over 69, but this pilot was possibly inadequately powered to demonstrate this difference.

Employment status was important for access to occupations, with unemployed respondents having access to fewer occupations. The inverse was true for the low-skilled occupations scale where respondents in occupations lower in the hierarchy scored more highly. This intuitively makes sense and helps to validate the scales.

As both the RG-UK and PG-UK had similar correlations with the GHQ and as the position generator methodology is more established, it could be argued that it is not worthwhile developing the resource generator further as a predictor of health status. However, resource generators have the advantage of including more detailed resource information rather than occupations alone which can only be proxies for social resources. As the resource generator authors indicate, it provides greater resource specificity and can be used alongside or instead of other social capital instruments (van der Gaag et al., 2008).

# Chapter 5
# Method

# 5  Method

## 5.1  Study design

To evaluate the effect of access to social capital on the course of depression, we used a prospective longitudinal cohort design. Cohort studies in mental health research are used to determine the relationship between a risk factor, or exposure, and an outcome. Classical cohort designs select participants on the basis of a single exposure, which must be ascertained before the outcome is known (Weich and Prince, 2003). We selected a cohort of people with depression in primary care and ascertained their access to social capital at baseline. Participants were not selected on the basis of their access to social capital, as we wanted to achieve a naturalistic distribution of the exposure to explore its relationship with the outcome. Depression scores at follow-up were measured independently of, and blind to, exposures.

A six month follow-up period was selected for the cohort. Incident samples of people with major depression have a six month recovery rate of about 60% (Coryell et al., 1994; Furukawa et al., 2000). However, a multinational observational study of major depression in primary care found much lower rates of remission over nine months (25-48%) (Akerblad et al., 2006). A further study found that 20% of those assigned to waiting lists in treatment trials improved without any treatment over six months (Posternak and Miller, 2001). It is very difficult to compare rates between studies because of varying follow-up periods (Gilchrist and Gunn, 2007). However, six months appeared to be a sufficient elapse of time to achieve some variation in improvement scores across the sample to help us to examine variables associated with recovery.

## 5.2  Setting

We selected three Primary Care Trusts (PCTs) – Richmond & Twickenham, Kingston and Sutton & Merton – to take part in the study. The three PCTs are located in outer south-west London and serve a population of almost 700,000 (see table 5.1 for key demographics).

**Table 5.1        Primary Care Trust demographics**

| Variable | England (%) | Kingston (%) | Richmond & Twickenham (%) | Sutton & Merton (%) |
|---|---|---|---|---|
| **Population** | | 147,273 | 172,335 | 367,676 |
| **Index of deprivation**[a] | | 266 | 301 | Merton=220 |
| (Rank out of 354) | | | | Sutton=236 |
| **Ethnicity**[b] | | | | |
| White British | 87.0 | 75.9 | 78.7 | 73.7 |
| Other White | 3.9 | 8.6 | 12.3 | 8.3 |
| Mixed | 1.3 | 2.3 | 2.2 | 2.6 |
| Indian | 2.1 | 3.6 | 2.5 | 3.3 |
| Pakistani | 1.4 | 1.3 | 0.4 | 1.6 |
| Bangladeshi | 0.6 | 0.3 | 0.4 | 0.6 |
| Other Asian | 0.5 | 2.6 | 0.7 | 2.5 |
| Black Caribbean | 1.1 | 0.5 | 0.4 | 2.5 |
| Black African | 1.0 | 1.0 | 0.5 | 2.4 |
| Other Black | 0.2 | 0.1 | 0.1 | 0.4 |
| Chinese | 0.5 | 1.4 | 0.8 | 1.0 |
| Other ethnicity | 0.4 | 2.5 | 1.3 | 1.3 |
| **Socio-economic classification**[b] | | | | |
| Higher managerial & prof. | 8.6 | 15.2 | 20.9 | 12.8 |
| Lower managerial & prof. | 18.7 | 25.3 | 28.7 | 24.3 |
| Intermediate occupations | 9.5 | 10.3 | 8.7 | 12.1 |
| Small employers | 7.0 | 7.0 | 7.2 | 7.2 |
| Lower supervisory & technical | 7.1 | 4.4 | 3.5 | 5.6 |
| Semi-routine occupations | 11.7 | 7.6 | 5.6 | 8.9 |
| Routine occupations | 9.0 | 4.3 | 3.3 | 5.4 |
| Long-term unemployed | 3.7 | 2.8 | 2.2 | 3.2 |
| Not classified | 24.7 | 23.1 | 19.8 | 20.4 |
| **Employment status**[b] | | | | |
| Employed / self-employed | 60.9 | 65.1 | 68.0 | 66.8 |
| Student | 7.3 | 11.0 | 7.2 | 6.7 |
| Unemployed | 3.4 | 2.5 | 2.6 | 2.9 |
| Retired | 13.5 | 9.8 | 10.0 | 10.8 |
| Looking after the home | 6.5 | 6.5 | 7.0 | 6.6 |
| Disabled / too unwell to work | 5.3 | 2.6 | 2.5 | 3.2 |
| Other economically inactive | 3.1 | 2.6 | 2.7 | 3.0 |
| **Marital status**[b] | | | | |
| Single | 30.2 | 37.7 | 36.4 | 36.1 |
| Married | 50.9 | 46.4 | 46.7 | 46.9 |
| Separated or divorced | 10.6 | 9.0 | 10.1 | 9.7 |
| Widowed | 8.3 | 6.8 | 6.8 | 7.3 |

[a] Rank of average score of indices of deprivation 2004. There are 354 local authorities and districts in England and the most deprived is given a score of 1 (Noble et al., 2004).
[b] Source: 2001 Census (Office for National Statistics, 2003)

The three PCTs contain a higher than average proportion of managers and professionals, but less than average people with routine occupations. Higher proportions are employed or single than the national average. The proportion of white British residents is lower than the national average but there are more than average from other white ethnic groups. Sutton & Merton have the highest proportion of non-white ethnic minorities. The three PCTs are co-terminus with four local authorities which all have below average levels of social deprivation (Noble et al., 2004)

## 5.3 GP practice recruitment

We gave 123 GP practices in the three PCTs brief information about the study and invited interested GPs to contact us to discuss the study further. Twelve practices requested further information and nine agreed to participate after meeting with the researcher, three from each PCT. One practice pulled out prior to recruiting any patients but another was later recruited from the same PCT in its place.

The low participation rate of 7.3% of GP practices was expected because of the immense pressures of work that they face and their reluctance to voluntarily take on additional responsibilities. Other primary care studies have faced similar difficulties. Livingston et al (2000), for example, achieved a very similar recruitment rate in their intervention study (14/121).

**Table 5.2        ACORN profiles of GP practice neighbourhoods**

| Category / group | Type |
| --- | --- |
| **Urban prosperity** | |
|    Prosperous professionals | Well-off professionals, larger houses and converted flats |
|    Educated urbanites | Young educated workers, flats |
| | Suburban privately renting professionals |
|    Aspiring singles | Singles & sharers, multi-ethnic areas |
| **Comfortably off** | |
|    Starting out | Young couples, flats and terraces |
|    Secure families | Younger white-collar couples with mortgages |
| **Hard pressed** | |
|    Burdened singles | Council flats, single elderly people |

The GP practices were located in diverse neighbourhoods, ranging from affluent communities to deprived council estates. To illustrate this diversity we have tabulated the different ACORN profiles (CACI Ltd, 2006) for the neighbourhoods that participating GP practices were located within (table 5.2). ACORN is a series of 56 geodemographic profiles derived from census data (Office for National Statistics, 2003) and lifestyle surveys. Although by necessity they are generalisations, they effectively summarise the key demographic features of each neighbourhood.

## 5.4   Sampling frame

The primary care practice registers formed the sampling frame for the study. As 95% of the UK population is registered with a GP these have very comprehensive coverage. However, only 80 out of 130 people with depression per 1000 population will consult their GP and only 31 of these 80 people with depression will have their illness diagnosed (National Collaborating Centre for Mental Health, 2004). Therefore it is likely that people with a diagnosis of depression in primary care experience more severe symptoms and for longer than in the general population (Katon and Schulberg, 1992), though the chronicity of depression in the general population is perhaps under-estimated (Viinamaki et al., 2006b).

A sampling frame of prevalent cases of depression was selected to enable us to study factors involved in maintenance or recovery from the condition. As these were not incident cases people who experience spontaneous remission were less likely to be included in the sample.

## 5.5   Sample

### 5.5.1   Inclusion criteria

People were eligible for inclusion in the study if they scored 8 or more on the Hospital Anxiety and Depression depression (HAD-D) subscale (Zigmond and Snaith, 1983). The cut-off score of 8 on the depression subscale (HAD-D) represents optimisation of sensitivity and specificity for screening cases of depression (Bjelland et al., 2002). In general practice the HAD-D has 90% sensitivity at detecting depression with 86% specificity (Wilkinson and Barczak, 1988) and it has been used in large studies of depression in UK primary care settings (e.g. Thompson et al., 2000). The HAD has good psychometric properties and performs well in assessing symptom severity in

health settings and in the general population (Bjelland et al., 2002; Herrman, 1997). Further, the HAD-D shows good responsiveness to change in depression in primary care (Cameron et al., 2008).

### 5.5.2    Exclusion criteria

To ensure the study's findings were generalisable to the highest proportion of primary care attendees as possible, only a few exclusion criteria were used. Firstly, we excluded people below 18 years of age, as we aimed to study adults, and over 75, as cognitive factors become a confounder over this age (Saunders et al., 1993). Secondly, those who were temporarily registered with the practice were excluded as follow-up might not have been possible. Thirdly, those with a primary diagnosis of drug or alcohol misuse were excluded as this could be a significant confounder. Fourthly, people detained in hospital under the Mental Health Act 1983 were excluded as their access to social capital could be severely curtailed. Finally, people known to be participating in other studies were excluded to avoid over-burdening them with research.

### 5.5.3    Power calculation

As there is no longitudinal data on the effect of access to social capital on depression, we decided to base our power calculation on a hypothesised difference between those with 'high' and 'low' social capital, with 'high' social capital referring to those scoring above the median on the Resource Generator-UK. The primary endpoint for the study was to be a minimum difference of 2 points in mean improvement scores on the HAD depression subscale (HAD-D) in the two groups. This difference is considered clinically significant (Grant et al., 2000). Assuming a standard deviation of 4 points on HAD-D, based on a RCT of people with common mental disorders in primary care (Harvey et al., 1998), this is a moderate standardised effect size of 0.5 (Cohen, 1988). Full data on 126 participants was needed (63 in each group) to have 80% power to detect a difference of this size at the 5% significance level.

## 5.6    Sample recruitment

The participating practices were asked to identify all their patients who met the inclusion criteria from their electronic databases. To identify people who were likely to score above the HAD threshold for depression, we asked them to search for all those with a current diagnosis of depression. As some practices did not maintain accurate

diagnostic records, they also searched for patients who had been prescribed anti-depressants within the last three months. We also asked them to apply the exclusion criteria to this list.

In the larger practices these searches returned sampling frames of more than 200 people. For example, practice F (table 5.3) produced a list of 436 people taking anti-depressants. In these practices we asked the practice manager to generate a random sample of up to 200 people to ensure that our sample would not be disproportionately drawn from only a few practices. In the smaller practices we mailed information about the study to all those potentially eligible.

To achieve complete data for a minimum of 126 participants we aimed to invite about 850 people to participate in the study. This allowed for 55% non-participation (468 cases), 50% negative screens (191 cases), 20% non-response to the first questionnaire (38 cases) and 15% loss to follow-up (23 cases).

Our estimated non-participation rate was based on the difficulties of recruiting participants for trials of psychological therapies for depression in primary care (Fairhurst and Dowrick, 1996). For example, a trial of guided self-help for people with anxiety and depression recruited only 20% of those who were invited to participate by post (Mead et al., 2005).

We allowed for 50% per cent negative screens to account for those who have experienced remission since being diagnosed with depression. This was based on a meta-analysis of remission rates for major depression in primary care, which found a mean remission rate of just over 50% for anti-depressant arms of intervention studies with follow-up periods of up to six months (Dawson et al., 2004).

A large international observation study of depression in primary care experienced an overall non-response of 38% and a loss to follow-up of 27% at three months and 40% at twelve months (Simon et al., 1999). We aimed to achieve substantially improved response and follow-up rates to achieve as complete and generalisable data as possible.

We chose to recruit by post because it was the most efficient method with the resources that were available for this study. Although this method can achieve low

response rates, it can generate a sufficiently representative sample of people with depression (e.g. Mead et al., 2005).

We mailed information about the study, a consent form and the self-complete HAD scale to 852 potentially eligible participants from eight practices (table 5.3). The ninth practice (C) was unable to confirm how many people they had sent information to, so was excluded from the response rate calculations. A GP from each practice wrote and signed a covering letter inviting patients to take part in the study. A stamped addressed envelope was enclosed for patients to reply to their practice. An administrator at each practice checked replies for eligibility and forwarded the details of eligible participants to the researcher.

People who did not respond to this mailing were sent a further letter three to four weeks later with the same enclosures as before. This generated a small number of additional respondents. (A respondent is defined as someone who completes a consent form, irrespective of whether they score above or below 8 on the HAD-D). Two practices placed alerts on the records of non-responders for GPs to ask them to consider taking part in the study when they next came in to the surgery. However, this did not generate any further responses.

**Table 5.3        Response to mailing group 1**

| PCT | | Mailed | Responded | Eligible | Response rate (%) |
|---|---|---|---|---|---|
| **Kingston** | | | | | |
| Practice A | | 92 | 34 | 23 | 37.0 |
| Practice B | | 50 | 16 | 9 | 32.0 |
| Practice C | | | | 1 | |
| | Sub-total | 142 | 50 | 33 | 35.2 |
| **Richmond & Twickenham** | | | | | |
| Practice D | | 66 | 5 | 1 | 7.6 |
| Practice E | | 180 | 65 | 45 | 36.1 |
| Practice F | | 198 | 58 | 30 | 29.3 |
| | Sub-total | 444 | 128 | 76 | 28.8 |
| **Sutton & Merton** | | | | | |
| Practice G | | 100 | 31 | 16 | 31.0 |
| Practice H | | 74 | 24 | 13 | 32.4 |
| Practice I | | 92 | 29 | 23 | 31.5 |
| | Sub-total | 266 | 84 | 52 | 31.6 |
| **Total** | | **852** | **262** | **161** | **30.8** |

The overall response rate was 30.8% from eight practices (table 5.3). Practice D achieved a response rate of only 7.6%. There may be a number of explanations for this. Firstly, an unknown error in the recruitment process may have occurred at this site, such as letters getting lost in the post. Secondly, as this was a relatively new practice, patients may not have developed as strong relationships with the GPs as they had done in the other more established practices. Anecdotal evidence from the practices that achieved the highest response rates (A & E, table 5.3), suggests that their patients generally held their GPs in high regard which may have increased their likelihood of responding. Thirdly, the catchment area of practice D was significantly less socially disadvantaged than the other practices and it was possible that the people there did not feel that the study was relevant to them.

We achieved a sample of 161 eligible responders that fell 30 short of our target. This was largely due to the non-participation rate being 20 per cent higher than planned (table 5.3). About six months into participant recruitment, four of the practices agreed to generate new samples and a further 252 people were invited to participate in the study (table 5.4). The response rate fell to 24.2% for this group despite following up non-respondents with the same procedure as before.

**Table 5.4        Response to mailing group 2**

| PCT | Mailed | Responded | Eligible | Response rate (%) |
|---|---|---|---|---|
| **Kingston** | | | | |
| Practice A | 40 | 10 | 3 | 25.0 |
| **Richmond & Twickenham** | | | | |
| Practice E | 46 | 14 | 10 | 30.4 |
| **Sutton & Merton** | | | | |
| Practice G | 140 | 31 | 17 | 22.1 |
| Practice I | 26 | 6 | 2 | 23.1 |
| **Total** | **252** | **61** | **32** | **24.2** |

Participation recruitment began in November 2004 and by the beginning of October 2005 we had achieved an eligible sample of 193 and an overall response rate of 29.3% (table 5.5). Although low, this still exceeded the 20% response achieved by Mead et al (2005) who used the same method.

### 5.6.1 Response bias

It was possible that recruiting by post rather than face to face in surgeries may have biased the sample in favour of more literate people and discouraged people who had English as a second language (in spite of offers on the information sheet to have an interpreter if required). The extent to which this occurred was difficult to assess.

**Table 5.5        Total response rate**

| PCT | | Mailed | Responded | Eligible | Response rate (%) |
|---|---|---|---|---|---|
| **Kingston** | | | | | |
| Practice A | | 132 | 44 | 26 | 33.3 |
| Practice B | | 50 | 16 | 9 | 32.0 |
| Practice C | | | | 1 | |
| | Sub-total | 182 | 60 | 36 | 33.0 |
| **Richmond & Twickenham** | | | | | |
| Practice D | | 66 | 5 | 1 | 7.6 |
| Practice E | | 226 | 79 | 55 | 35.0 |
| Practice F | | 198 | 58 | 30 | 29.3 |
| | Sub-total | 490 | 142 | 86 | 29.0 |
| **Sutton & Merton** | | | | | |
| Practice G | | 240 | 62 | 33 | 25.8 |
| Practice H | | 74 | 24 | 13 | 32.4 |
| Practice I | | 118 | 35 | 25 | 29.7 |
| | Sub-total | 432 | 121 | 71 | 28.0 |
| **Total** | | **1104** | **323** | **193** | **29.3** |

Further, it was possible that those who chose not to participate in the study may have been those who also tended to avoid social contact.  This group may have had lower social capital than those who did participate as a result of their relative social isolation. In order to assess this, we planned to ask GPs to rate each potential participant on a Likert-type scale of whether they perceived the individual to actively seek or avoid social contact (figure 5.1) as a crude proxy of social capital.  However, it was dropped from the study after being piloted in one practice, as GPs found it an intolerable burden to complete and, as they varied in their knowledge of their patients, it would not produce reliable results.

Therefore, to assess for response bias we asked practices to provide anonymised data on the age and gender of non-respondents. Unfortunately, most of the practices had difficulty retrieving this data and it was only available for three (practices A, E & F). In

these practices women formed a proportion of the respondents (67.5%) that was very similar to the non-respondents (66.7%) ($\chi^2$(1)=0.32, p=ns). Also, although non-respondents (mean age=44.4) were younger than respondents (mean age=46.7), the difference was not statistically significant (t(554)=-1.8, p=0.07). (For the purpose of this calculation, we took their age on 1st January 2005). From these practices it can be concluded that there was no response bias by sex or age using this recruitment method.

**Figure 5.1        Social contact scale**
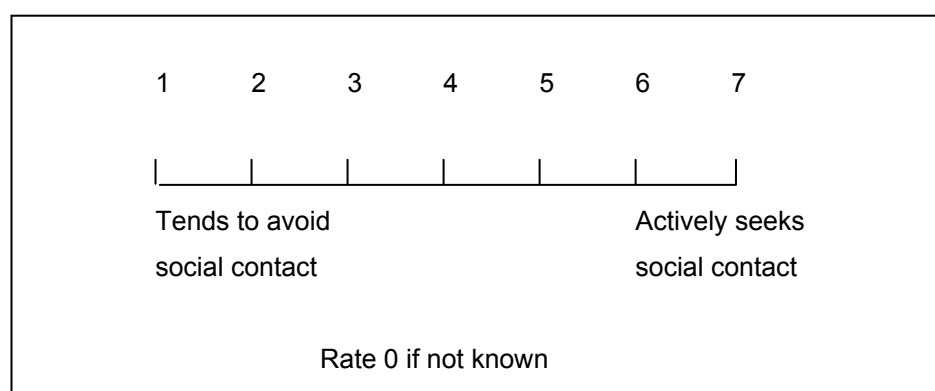


We also assessed whether respondents who scored at least 8 on HAD-D were different from those who did not. We gained the anonymised age and sex of ineligible responders from four practices (practices A, E, F & I) and found that there was no difference according to sex (69.7% of female ineligible responders vs. 73.1% of female eligible responders, $\chi^2$(1)=0.28, p=ns) or age (t(208)=0.25, p=ns).

## 5.7   Study Procedures

### 5.7.1   Time One Questionnaire

On receipt of the completed consent forms and HAD screens by the researcher, eligible participants were sent a postal questionnaire (Appendix D) and a stamped addressed envelope. Participants were asked to complete and return it within two weeks.

The questionnaire was carefully designed to ensure readability and ease in completion to maximise response rates (Dillman, 1983; Sheatsley, 1983). We also designed it to be as brief as possible to minimise respondent burden. It began with basic demographic information and included ethnic categories used in the census (Office for

National Statistics, 2003) to facilitate comparison. To ascertain socio-economic status we asked for household income, highest educational attainment and occupation.

We included some questions about previous episodes of depression, as they may have been associated with both the chronicity of symptoms and the availability of support (Kessler and Magee, 1994). We asked the participant to self-define their history of depression ("have you suffered from depression before?" and "how many times have you suffered from depression before?"). We also asked how long the participant had been depressed for and what treatment for depression they were receiving.

We included some questions about family history of depression, as a genetic vulnerability may affect the course of depression (Goldberg, 2006; Tozzi et al., 2008). Again, these questions required respondents to self-define these episodes ("has anyone in your family suffered from depression before?", "what relation is this person to you?" and "when was he/she depressed?").

There are potentially numerous variables that may affect the course of depression for participants. We selected those most likely to be associated with either the outcome (change in depression scores) or hypothesised predictor (access to social capital). Brief measures, with established validity and reliability in primary care populations, were chosen to measure these.

Firstly, life events have been shown to affect the course of depression (Brown et al., 1988; Brugha et al., 1997). In particular, severely negative events and difficulties perpetuate episodes (Brown and Harris, 1978) and fresh starts or positive experiences promote remission (Harris et al., 1999b; Leenstra et al., 1995; Oldehinkel et al., 2000). We used a self-complete version of the List of Threatening Experiences (LTE-Q) life events inventory (Brugha et al., 1985). The LTE has acceptable reliability (Brugha and Cragg, 1990) and has been shown to be associated with increased risk for depression (Brugha and Conroy, 1985). It is brief and has been used in other samples of people with depression (e.g. Andrews and Wilding, 2004; Michalak et al., 2004).

Secondly, social support is associated with better recovery (George et al., 1989; Heponiemi et al., 2006; Hobfoll et al., 2003). To measure this we used the Close Persons Questionnaire (CPQ) (Stansfeld and Marmot, 1992) that was originally developed for the Whitehall II study (Marmot et al., 1991). The CPQ contains three sub-scales derived by factor analysis that measure emotional support, practical support

and the negative aspects of close relationships (Stansfeld and Marmot, 1992). We used a briefer version from the EMPIRIC study (Stansfeld and Sproston, 2002), which asks about support received over the previous twelve months from only the two people that the respondent felt closest to, in order to minimise respondent burden.

Thirdly, we used a self-rated physical health question ("currently would you say that your physical health is … excellent/good/fair/poor?") as there is substantial evidence of co-morbidity of physical disorders and depression (Paykel et al., 2005). Self-rated health questions have been used in the General Household Survey for almost 30 years (Office for National Statistics, 2004) as it is a good independent predictor of mortality (Idler and Benyamini, 1997; Mossey and Shapiro, 1982) and it appears to be a valid and reliable measure of health (Clarke and Ryan, 2006; Singh-Manoux et al., 2006). There is also evidence of an association with individual-level social capital (Rose, 2000; Veenstra, 2000). Physical impairment may impede an individual's ability to make social contacts and generate social capital.

Fourthly, it is likely that people with an insecure attachment find it more difficult to make social contacts and generate social capital as it is associated with low self-esteem and poor support (Bifulco et al., 2002b). It is also independently associated with depression (Bifulco et al., 2002a). Hence we included a question about attachment style (Bartholomew and Horowitz, 1991) to capture this. Bartholomew and Horowitz's (1991) four category model (secure, preoccupied, fearful and dismissing) corresponds well with other attachment questionnaires (Allen et al., 2001) but has the advantage of brevity. Also, it is sensitive to the range and complexity of attachment-related difficulties experienced in adulthood (Bartholomew, 1997).

Finally, in addition to our new measures of access to social capital (Resource Generator-UK, and Position Generator-UK), we included the subjective items from the Manchester Short Assessment of Quality of Life (MANSA) (Priebe et al., 1999) as the dependent variable for our second hypothesis. This instrument measures quality of life in the tradition of Lehman's (1988) satisfaction model which includes both objective and subjective indicators. We used only the subjective items of the MANSA because many of the objective indicators were already included in the socio-demographic section of our baseline questionnaire. Subjective ratings of quality of life used a seven-point delighted-terrible scale (Andrews and Withey, 1976) on which a low rating (1) indicated extreme dissatisfaction and a high rating (7) extreme satisfaction. These subjective ratings have been used in a number of different populations (e.g. Adamowski et al.,

2005; Depla et al., 2006; Huxley et al., 2004; Lindstedt et al., 2005; Slade et al., 2005; Sun et al., 2002) including the UK general population (e.g. Brugha and Evans, 2003; Evans et al., 2007) to provide normative data for comparison.

### 5.7.1.1 Questionnaire piloting

We asked the first twelve participants who completed the questionnaire to evaluate it with a brief further questionnaire (appendix D). Their responses indicated that the questions were generally not difficult to understand or answer and respondent burden was minimal as the mean completion time was only 33 minutes (range 10-55 minutes). Two respondents in the pilot encountered difficulties in answering questions about their depression (q.12-13, 18), their family history of depression (q.14-17) and their attachment style (q.29). Another made a general comment about finding it difficult to answer questions about friendships or family members. Only one respondent found a question a little unclear (RG-UK, q.30-32).

Of the additional comments that were made by the respondents to the pilot, one noted that there was no question on housing status. We realised that this was an omission and inserted it for subsequent participants. We also obtained this data from the twelve pilot respondents to ensure completeness of data.

One respondent noted that there was no Scottish equivalents given to the English qualifications (q.9) and that we did not include a question on non-completed education. Additionally, one noted that those whose income did not arrive monthly may find it difficult to answer q.11. Although some respondents subsequently put weekly or annual incomes, we calculated the pro-rata monthly figure for our data set. Finally, one stated that some answers would depend on how you are feeling the day the questionnaire is completed, another questioned the relevance of the PG-UK (q.33) to mental health and one found the questions about relationships with friends difficult as s/he did not have any.

### 5.7.1.2 Non-respondents

If participants did not complete the questionnaire within two weeks of it being sent, a further one was sent to them and a follow-up phone call was made to check whether the participant had any difficulties in completing it. In most cases this prompted the participant to complete it. However, 10.4% (n=20, figure 5.2) did not complete it despite

several follow-ups, though this was fewer than we had anticipated. Only three participants gave a reason for withdrawing from the study at this stage (figure 5.2).

**Figure 5.2        SAFIRE study flow diagram**
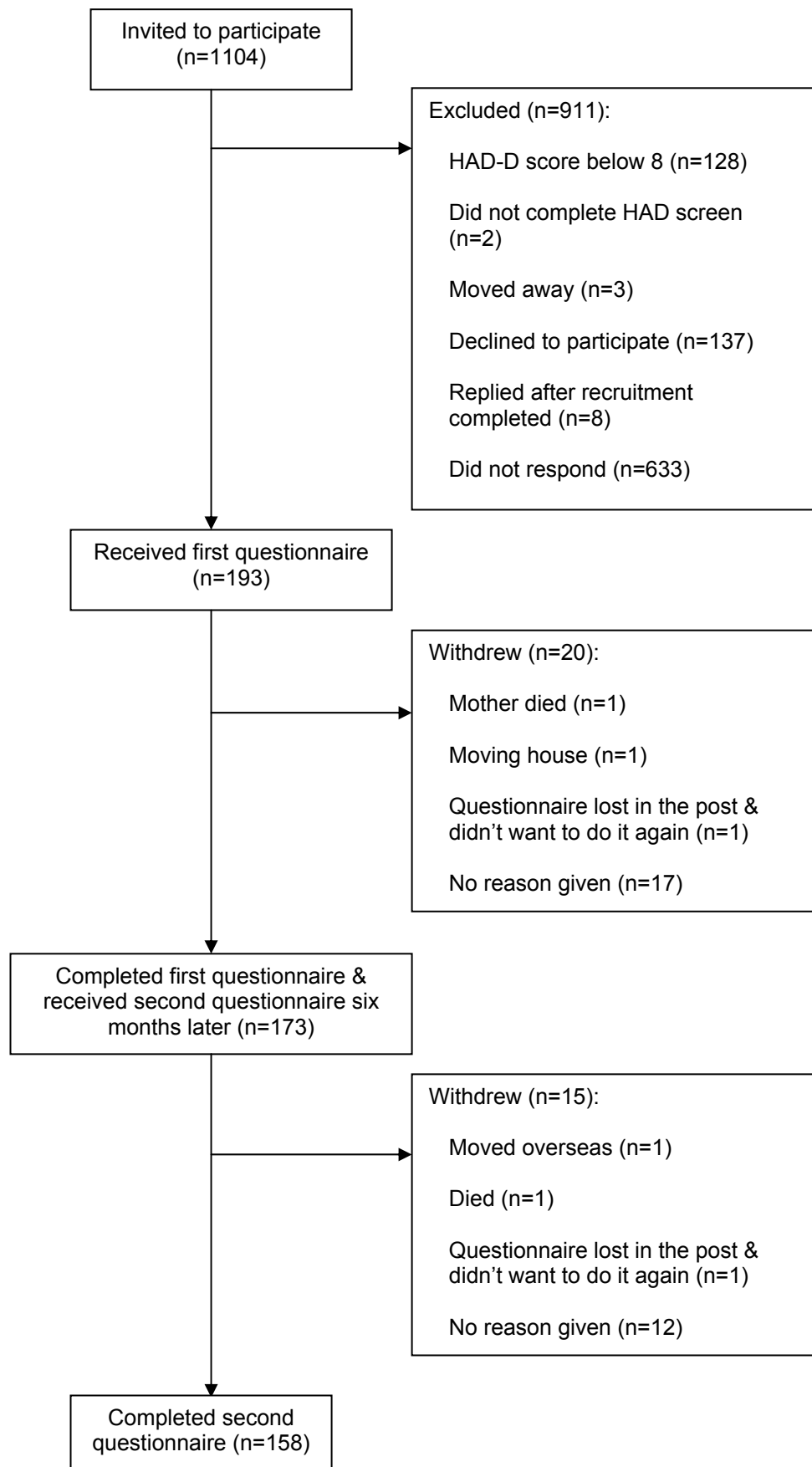
### 5.7.1.3   Completion delays

127 participants (73.4%) completed the first questionnaire within five weeks of the original screen with over half completing it within just three weeks (56.1%, n=97). The median time taken was 18 days (range 0-96). These delays represent the elapsed time between the participant completing and returning the screen and consent form to their surgery, the forwarding of these documents to the researcher, and the mailing, completion and return of the questionnaire. Delays were possible at any stage of this process. In particular, practices were sometimes slow in forwarding the details of the eligible participants. In some cases (n=4) where there was a long delay between completion of the screen and the first questionnaire, participants were asked to complete the screen again to confirm their eligibility. In none of these cases were the participants ineligible.

### 5.7.2   Time Two Questionnaire

A short while before 26 weeks after completion of the first questionnaire had elapsed participants were sent a second questionnaire (Appendix D). This was structured in a very similar way to the first one and included the HAD, LTE-Q, CPQ, RG-UK, PG-UK, subjective MANSA items, four category model of attachments and self-rated physical health question. We also asked about treatments being taken for depression ("are you currently receiving any treatment for depression?" and "please state which treatment you are receiving").

A stamped-addressed envelope was provided for the reply and we followed up non-responders with further questionnaires and telephone calls as required. 158/173 participants returned the second questionnaire, a follow-up rate of 91.3%. Only three reasons were obtained for withdrawal (figure 5.2) and these included one participant who died.

On average, participants returned the second questionnaire 26.5 (s.d.=2.8) weeks after the first (range=23 to 41). 139 participants (88.0%) returned the second questionnaire within 3 weeks of the 26 week target.

Due to completion delays outlined above and some variation in time taken to complete the second questionnaire, the elapsed time between the HAD screen and the second questionnaire varied from 24.0 to 46.3 weeks. 79.8% (n=126) of the participants were

within four weeks of the median elapsed time of 28.9 weeks. As it was possible that participants with a longer period of elapsed time between completions of the HAD may have improved more than others, this variable was tested for an association with change in HAD-D scores in our analysis. However, no significant association was found.

### 5.7.3    Interview

On completion of the second questionnaire participants were invited to attend a semi-structured interview to discuss the following themes. Firstly, as the RG-UK measured access to social capital, we were interested to learn more about the extent to which this had been mobilized in the six month period between questionnaires. We also asked about the process of accessing resources and any difficulties encountered with this.

Secondly, we asked participants about their perception of the course of their illness over the previous six months and their perception of recovery. This was included as health beliefs are understood to be important for outcomes (Conner and Norman, 1998) and it ensured that participants played a role in defining their own recovery (Coleman, 1999).

Thirdly, we investigated whether any 'fresh-start' experiences occurred (Harris et al., 1999b), as these may be important for recovery, and the role of social capital in these.

Finally, we asked about received social support over the six month period (Brown et al., 1988; Brown et al., 1986; Edwards et al., 1998) as a validity check on the measure of perceived social support (CPQ) used in the two questionnaires.

134/158 (84.8%) participants were interviewed. However, reporting the results of these interviews is beyond the scope of this thesis and this data will be published separately.

## 5.8    Data management

### 5.8.1    Data entry

Data was entered into Stata v.9 (StataCorp, 2006) for analysis as questionnaires were returned.

### 5.8.2   Data cleansing

Data was double-checked as it was entered to minimise errors. A validity check on this approach was undertaken. Firstly, we ran frequencies for all the variables to check for obvious errors and none were found.

Secondly, six cases were selected at random in the Stata data file and each data field was checked against its respective questionnaire entry for errors. Only 4 minor errors were found from a total of 5,148 fields (0.08%). These were data entry errors in the detailed dichotomous relationship category variables of the RG-UK and PG-UK, which were not required for our regression models. Although no data entry errors are acceptable, having less than 0.1% error suggests that our method of data entry was very accurate.

## 5.9   Analysis

### 5.9.1   Primary hypothesis

The outcome variable of interest in our primary hypothesis was change in HAD-D scores at follow-up. We hypothesised that access to resources as measured by the RG-UK will be associated with this outcome. Using a series of univariate and multivariate analysis we developed a parsimonious model explaining the variance in change in HAD-D scores at follow-up.

### 5.9.2   Univariate analysis

We used descriptive statistics to describe the sample and make comparisons with other primary care samples to assess the potential generalisability of our findings. We used paired t-tests to evaluate change at follow-up and Wilcoxon signed-rank test (Wilcoxon, 1945) as a non-parametric alternative.

We then explored the data using univariate statistics such as t-tests, one-way analysis of variance (with Bonferroni correction to allow for multiple comparisons) and Pearson's correlation coefficients to evaluate the extent to which the potential explanatory variables were associated with our outcome. Non-parametric equivalents, such as Spearman's rank correlation, were used for variables with substantially skewed

distributions. This process helped us to identify variables that needed to be entered into the multivariate regression models.

### 5.9.3    Analysis of covariance

To evaluate change over time and consider the effect of multiple predictor variables we used analysis of covariance (equation 5.1).

**Equation 5.1    Analysis of covariance**

$$y_{it2} = \beta_0 + \beta_1 y_{it1} + \ldots + \varepsilon_i$$

Where: $y_{it2}$ = outcome measure observations for participant $i$ at time $t_2$

$y_{it1}$ = outcome measure observations for participant $i$ at time $t_1$

$\varepsilon_i$ = error for participant $i$

Analysis of covariance corrects for the phenomenon of regression to the mean (Twisk, 2003). The change in the outcome measure is defined relative to its value at time $t_1$ and is expressed in the regression coefficient $\beta_1$. Firstly, we performed a linear regression analysis between $y_{it2}$ and $y_{it1}$. Then we calculated the difference between the observed value of $y_{it2}$ and the predicted value of $y_{it2}$. This difference was the residual change (Blomquist, 1977) which was then used as the outcome variable in a linear regression analysis.

Analysis of covariance was selected in preference to random effects models (Laird and Ware, 1982), which formalize the idea that an individual's pattern of responses is likely to depend on many characteristics of that individual including some that are unobserved. Although random effects models account for repeated measures, spurious findings emerge when used in studies with only two time points.

To develop a parsimonious model with a set of predictor variables which best explained the variance in change of HAD-D scores at follow-up, we entered one variable at a time into the regression model. We began by testing the effect of potential confounders on the association between the RG-UK scales and change in HAD-D scores. Then we

continued to enter and subtract variables one at a time into the model to evaluate their effect on it.

We evaluated the strength of each model using Akaike's Information Criterion (AIC) (Akaike, 1974). The AIC model selection approach denies the existence of an identifiable true model and uses expected prediction of future data as the key criterion for the adequacy of a model. The model with the smallest value of AIC is the model closest to full reality from the set of models considered. We also calculated the AIC related measures – delta AIC, likelihood, Akaike's weight and evidence ratio – to evaluate evidence of the relative strengths of competing models.

In the regression analyses we log transformed highly skewed continuous variables and created dummies for categorical variables. We used the Huber-White estimator of variance (Huber, 1967; White, 1980) to give the most accurate assessment of sample variability and to allow for other variables departing slightly from a normal distribution. Regression assumptions were checked by inspecting the box-plot of residuals, the residual plot and the partial residual plot of explanatory variables.

### 5.9.4    Secondary hypotheses

The outcome for the secondary hypothesis was overall quality of life at follow-up as assessed by the MANSA question "How do you feel about your life as a whole?" We repeated the analysis strategy used in the first hypothesis to develop a parsimonious model with a set of predictor variables which best explained the variance in overall quality of life at follow-up.

### 5.9.5    Statistical software

All analysis was conducted using Stata v.9 (StataCorp, 2006).

### 5.9.6    Reporting

In the presentation of our results we have reported non-significant p-values between 0.05 and 0.1 in full, but those above 0.1 are stated as 'ns'. In the regression models we have reported both the regression coefficient $\beta$ and standardised beta to evaluate the relative effect of each covariate on the outcome in the model.

# Chapter 6
# Results

# 6    Results

## 6.1    Sample characteristics

### 6.1.1    Demographics

Women formed 72.8% of the sample (n=126). This was slightly higher than the 2:1 gender ratio reported in the international literature (Maier et al., 1999; Weissman et al., 1996) and the 1.5:1 ratio for all neurotic disorders in the UK national psychiatric morbidity survey (Singleton et al., 2000). However, it does reflect evidence of women being more likely to seek help for depression than men (Oliver et al., 2005).

The mean age of the sample was 46.0 (s.d.=12.2), reflecting a peak in the prevalence of depression between the ages of 35 and 54 (Singleton et al., 2000) and the reluctance of young people to seek help (Oliver et al., 2005). Only 29.5% (n=51) of the sample had any children aged under 16 living with them. This was more likely to be because of the age profile of the participants rather than their marital status (table 6.1), which broadly reflected the local population (table 5.1). However, divorced people were over-represented in the sample, reflecting their increased vulnerability to common mental disorders (Singleton et al., 2000).

Participants from non-white ethnic groups (n=15, 8.7%) were under-represented in the sample (table 6.1). UK findings about the prevalence of depression in ethnic minorities are inconsistent (Karlsen et al., 2005). The national psychiatric morbidity survey found a similar prevalence of depression amongst black and white ethnic groups, with an increased prevalence for south Asian and 'other' ethnic groups (Singleton et al., 2000). However, an earlier national study of ethnic minorities reported a higher prevalence for Caribbeans and lower prevalence for people of Asian origin (Nazroo, 1997). The under-representation of ethnic minorities in our sample may be a product of our sampling procedure or may be because of the under-detection of depression amongst these groups in primary care (Nazroo, 1998).

**Table 6.1        Sample demographics**

| Variable | Sample n=173(%) |
|---|---|
| **Marital status** | |
| Single | 45 (26.0) |
| Married or cohabiting | 93 (53.8) |
| Divorced | 29 (16.8) |
| Widowed | 6 (3.5) |
| **No of children under 16** | |
| None | 122 (70.5) |
| 1 | 19 (11.0) |
| 2 | 22 (12.7) |
| >2 | 10 (5.8) |
| **Ethnicity** | |
| White British | 146 (84.4) |
| White Other | 12 (6.9) |
| Black African | 1 (0.6) |
| Black Other | 1 (0.6) |
| Indian | 3 (1.7) |
| Pakistani | 1 (0.6) |
| Chinese | 1 (0.6) |
| Asian other | 2 (1.2) |
| Mixed parentage | 6 (3.5) |

## 6.1.2    Socio-economic status

The socio-economic gradient in the prevalence of depression (Fryers et al., 2005; Lewis et al., 1998) was not clearly reflected in our sample (table 6.2). Only 21 (12.1%) participants were from the bottom three social groups of the SOC (Office for National Statistics, 2000). However, there was a high proportion of missing data (n=61, 35.3%) as social class coding was established from current or previous occupation and was not available for participants who had not worked recently. Therefore this needs to be treated with some caution. It is possible, though, that the relatively high proportion from the top three social groups (n=46, 26.6%) could be a reflection of the source population that has a high proportion of managers and professionals (table 5.1).

Employment and income data suggested that the sample was relatively deprived in comparison with its source population. Firstly, only 77 participants (44.5%) were employed, which was lower than other primary care samples (e.g. Boardman et al., 2004; De Almeida Fleck et al., 2005) and the general population which was over 60% (table 5.1). Secondly, there was a large range in household monthly incomes from £0 to £6,000 with a mean of £1,467.69 and a median of £1,100. Income data was not

available for 34 participants (19.7%). The sample mean income was about half of the average gross household monthly income of £2,929.33 in London in 2001-2 (Office for National Statistics, 2002). Thirdly, over half (54.4%, n=94) did not have any post-compulsory education (table 6.2). This also suggested that people with a lower academic ability were not discouraged from participating in the study. Several people stated that they had dyslexia, but there were no obvious indications that their questionnaires were incomplete. Although we did not assess this formally, this suggested that it did not act as a barrier to participation in this predominantly questionnaire-based study.

The living situation of study participants appeared to reflect the age distribution of the sample and the GP practice catchment areas with 99 (57.2%) being owner-occupiers (table 6.2).

### 6.1.3   Mental health

#### 6.1.3.1   Previous episodes

This was the first episode of depression for only 28.9% (n=50) participants in the study. The majority (59.5%, n=103) had experienced more than one previous episode of depression.

#### 6.1.3.2   Current episode

The length of the current episode of depression ranged from 1 month to 53 years, with a median length of 3 years.

At baseline the mean HAD-D score for the sample was 12.0 (s.d.=3.2), within the moderate range (11-15) of the scale (Snaith and Zigmond, 1994) . Only 15.0% (n=26) were in the severe range (16-21). Mean HAD-A scores were also within the moderate range (13.7, s.d.=3.9). As only 6.4% (n=11) of the sample scored below the threshold for a likely case of anxiety, there was a high prevalence of mixed anxiety and depression in the sample as there is in the general population (Singleton et al., 2000). Women's HAD-A scores were higher than men (mean difference=1.90 (95%CI=0.63 to 3.18), t(171)=2.95, p=0.004), though there were no differences in HAD-D scores according to gender.

**Table 6.2     Sample socio-economic characteristics**

| Variable | Sample n=173(%) |
|---|---|
| **Social class grouping**[a] | |
| Managers and senior officials | 10 (5.8) |
| Professional | 20 (11.6) |
| Associate professional & technical | 16 (9.2) |
| Administrative & secretarial | 18 (10.4) |
| Skilled trades | 11 (6.4) |
| Personal service | 16 (9.2) |
| Sales & customer service | 9 (5.2) |
| Process, plant & machine operatives | 3 (1.7) |
| Elementary | 9 (5.2) |
| Not known | 61 (35.3) |
| **Employment status** | |
| Employed / self-employed | 77 (44.5) |
| Student | 2 (1.2) |
| Unemployed | 17 (9.8) |
| Retired | 20 (11.6) |
| Looking after the home | 14 (8.1) |
| Carer | 2 (1.2) |
| Unable to work due to disability or ill-health | 41 (23.7) |
| **Education** | |
| No formal qualifications | 43 (24.9) |
| CSE/GCSE or equivalent | 51 (29.5) |
| A level or equivalent | 26 (15.0) |
| Degree | 34 (19.7) |
| Postgraduate degree | 12 (6.9) |
| Not known | 7 (4.0) |
| **Living situation** | |
| Owner occupier | 99 (57.2) |
| Rented | 55 (31) |
| Living with family / carer | 8 (4.7) |
| Sheltered housing | 1 (0.6) |
| Temporary accommodation | 7 (4.1) |
| Not known | 3 (1.7) |

[a] Standard Occupational Classification (Office for National Statistics, 2000)

At follow-up mean HAD-D and HAD-A scores were significantly lower at 9.4 (s.d.=4.4) (t(157)=9.13, p<0.0001) and 11.7 (s.d.=4.5) (t(157)=7.02, p<0.0001) respectively. 59 (37.3%) participants scored below the HAD-D threshold of 8 at follow-up in contrast to only 28 (17.7%) who were below the same threshold for HAD-A. This indicated that anxiety symptoms were more severe and persistent in this sample than depression symptoms. The difference between the genders on HAD-A persisted at follow-up with

women scoring a mean of 1.90 (95%CI=0.35 to 3.45) more points on the scale than men (t(156)=2.42, p=0.017).

### 6.1.3.3 Treatment

70.5% (n=122) of the sample were taking anti-depressants at baseline. An additional 9.2% (n=16) did not specify which treatment they were taking, possibly because they had stopped taking anti-depressants that had been prescribed for them. A high level of anti-depressant use in the primary care sample suggests substantial concordance with NICE guidelines (National Collaborating Centre for Mental Health, 2004) in the recruiting surgeries. However, it is possible that sub-therapeutic dosing or non-compliance were minimising potential treatment effects (Donoghue and Hylan, 2001). A much smaller proportion was receiving other therapies such as counselling (table 6.3), which highlighted a predominantly medical approach to the treatment of depression in these surgeries.

Reflecting the decrease in depression scores over the six months, the proportion of participants who were not receiving any treatment at follow-up more than doubled from 14.5% (n=25) to 30.4% (n=48). There was a corresponding decrease in the use of non-drug treatments (table 6.3).

**Table 6.3        Treatments receiving**

| Treatment | Baseline n=173(%) | Follow-up n=158 (%) |
|---|---|---|
| None | 25 (14.5) | 48 (30.4) |
| Anti-depressants | 96 (55.5) | 89 (56.3) |
| Anti-depressants plus counselling | 22 (12.7) | 15 (9.5) |
| Anti-depressants plus other therapy | 4 (2.3) | 1 (0.6) |
| Counselling only | 4 (2.3) | 2 (1.2) |
| Support group | 1 (0.6) | 0 |
| Unspecified treatment | 16 (9.2) | 2 (1.2) |
| Not known | 5 (2.9) | 1 (0.6) |

At baseline, only 5.8% of the sample (n=10) stated that they were receiving care from secondary mental health services, such as seeing a psychiatrist or a CPN. At follow-up the proportion was very similar (7.0%, n=11).

### 6.1.3.4 Family history

Over half the sample (51.2%, n=86) identified at least one blood relative who had suffered from depression. A total of 111 relatives were identified by this group, of whom parents formed a high proportion (55.0%, n=61) (table 6.4). In particular, maternal depression was very common in this group, reflecting a possible genetic vulnerability. Biologically closer relatives were recalled by participants more frequently, because they would have been more aware of their mental health than more distant relatives, but also because of possible proximal genetic risks (Goldberg, 2006). Further, women were more likely to report a family history of depression than men (57.7%vs.33.3%, $\chi^2(1)=7.84$, p=0.005), reflecting the increased heritability of depression in women than men (Kendler et al., 2006).

**Table 6.4        Family history of depression**

| Relation | n=111 (%) |
|---|---|
| Mother | 44 (39.6) |
| Father | 17 (15.3) |
| Sister | 17 (15.3) |
| Brother | 7 (6.3) |
| Daughter | 7 (6.3) |
| Son | 5 (4.5) |
| Grandmother | 5 (4.5) |
| Uncle | 3 (2.7) |
| Aunt | 2 (1.8) |
| Grandfather | 1 (0.9) |
| Great Uncle | 1 (0.9) |
| Nephew | 1 (0.9) |
| Great grandfather | 1 (0.9) |

### 6.1.4   Physical health

The self-reported physical health of the participants was poor in comparison to the general population. Only 22.5% (n=39) of our sample rated their physical health as 'good' or better at baseline in contrast to 56% of the general population who rated their health as 'good' in the General Household Survey in 2002 (Office for National Statistics, 2004). This changed very little over six months with a similar proportion (24.1%, n=38) reporting their health as 'good' or 'excellent' at follow-up (table 6.5). As one in two people with major depression report painful physical symptoms (Demyttenaere et al., 2006) this finding is perhaps not unexpected.

**Table 6.5        Self-reported physical health**

| Self-reported health | Baseline n=173 (%) | Follow-up n=158 (%) |
|---|---|---|
| Poor | 47 (27.2) | 42 (26.6) |
| Fair | 79 (45.7) | 71 (44.9) |
| Good | 36 (20.8) | 36 (22.8) |
| Excellent | 3 (1.7) | 2 (1.3) |
| Not known | 8 (4.6) | 7 (4.4) |

### 6.1.5   Life events

There was an average of 1.64 (s.d.=1.76) threatening life events per participant in the six months prior to baseline. This reduced slightly to 1.42 (s.d.=1.40) for the following six months, but this difference was not significant. The proportion of people who experienced two or more such life events in both time periods (43.9% & 38.7% respectively, table 6.6) also did not significantly change. The number of threatening life events experienced in this sample was very similar to other samples of people with depression (e.g. Michalak et al., 2004; Surgenor and Joseph, 2000).

In the six months prior to baseline there was a non-significant trend towards men reporting more life events than women (t(171)=1.94, p=0.054), though there was no difference at follow-up.

**Table 6.6        Life events**

| Number of life events in preceding six months | Baseline n=173 (%) | Follow-up n=158 (%) |
|---|---|---|
| 0 | 50 (28.9) | 48 (30.4) |
| 1 | 47 (27.2) | 49 (31.0) |
| 2 | 39 (22.5) | 29 (18.4) |
| >2 | 37 (21.4) | 32 (20.3) |

### 6.1.6   Social networks

As patterns of social relations vary by gender (Vaux, 1988) the results of the Close Persons Questionnaire (CPQ) (Stansfeld and Marmot, 1992) are presented according to gender.

**6.1.6.1   Relatives**

At baseline, a high proportion of both men (78.7%, n=37) and women (84.1%, n=106) reported having contact with relatives. Women had more frequent contact with their relatives than men, as 70.6% (n=89) of women had contact with a relative at least once a week in contrast to 51.1% (n=24) of men ($\chi^2$(1)=5.79, p=0.016). However, both women and men had less frequent face to face contact with their relatives, with 38.1% (n=48) and 27.7% (n=13) respectively seeing a relative at least once a week. There were no significant changes to these proportions at follow-up.

**6.1.6.2   Friends**

A slightly higher proportion of men (87.2%, n=41) and women (89.7%, n=113) had contact with friends at baseline than relatives. Women did not have any more frequent contact with friends than relatives, as the same proportion of women had contact with a friend at least once a week (70.6%, n=89). However, a higher proportion of men (59.6%, n=28) had this frequency of contact with friends than relatives. As with their relatives, smaller proportions of men (31.9%, n=15) and women (34.1%, n=43) had face to face contact with friends at least once a week. Again, there were no significant changes to these proportions at follow-up.

There was no difference between men and women in the number of friends or relatives that they saw at least once a month. However, participants saw a median of two (inter-quartile range=1-4) friends at least once a month in contrast to a median of one (inter-quartile range=0-2) relative (z=-5.38, p<0.0001) at baseline. This difference persisted at follow-up (z=-4.27, p<0.0001).

**6.1.6.3   Close contacts**

At baseline 90.2% (n=156) of participants felt close to at least one person. This fell slightly to 85.4% (n=135) at follow-up. At baseline women reported a median of three people (inter-quartile range=2-5) they felt close to in contrast to men who reported a median of two (range=1-3) ($\chi^2$(1)=4.18, p=0.041). This was rather fewer than the cohort of civil servants in the Whitehall II study for both men and women (Fuhrer et al., 1999), possibly reflecting the smaller social networks and less social contact of people with depression (Brugha et al., 1982; Johnson, 1991). This did not significantly change over the next six months.

### 6.1.6.4   Closest person

Of those who identified a close person, women and men reported in similar proportions (54.3% and 61.5% respectively) that the person they felt closest to was a woman. Only 35.0% (n=14) of men and 32.8% (n=38) of women reported they felt closest to their spouse or partner, rather fewer than in the Whitehall II cohort (Stansfeld et al., 1998) where the proportions were 92% and 80% respectively. There were no significant changes with these proportions at follow-up (table 6.7).

**Table 6.7        Relationship with closest person**

| Relationship | Baseline n=173 (%) | Follow-up n=158 (%) |
|---|---|---|
| No close person | 17 (9.8) | 23 (14.6) |
| Partner or spouse | 51 (29.5) | 49 (31.0) |
| Friend | 47 (27.2) | 35 (22.2) |
| Mother | 16 (9.2) | 9 (5.7) |
| Daughter | 13 (7.5) | 11 (7.0) |
| Sister | 8 (4.6) | 12 (7.6) |
| Brother | 6 (3.5) | 3 (1.9) |
| Son | 4 (2.3) | 3 (1.9) |
| Father | 3 (1.7) | 2 (1.3) |
| Neighbour | 2 (1.2) | 0 |
| Aunt | 1 (0.6) | 1 (0.6) |
| Uncle | 1 (0.6) | 0 |
| Cousin | 1 (0.6) | 1 (0.6) |
| Counsellor | 1 (0.6) | 0 |
| Mother-in-law | 1 (0.6) | 0 |
| Boyfriend / girlfriend | 1 (0.6) | 5 (3.2) |
| Ex-partner | 0 | 2 (1.3) |
| Colleague | 0 | 1 (0.6) |
| CPN | 0 | 1 (0.6) |

**Table 6.8        Distance from closest person**

| Distance | Baseline n=173 (%) | Follow-up n=158 (%) |
|---|---|---|
| No close person | 17 (9.8) | 23 (14.6) |
| With you | 60 (34.7) | 55 (34.8) |
| Within walking distance | 26 (15.0) | 21 (13.3) |
| Within half an hour's drive | 30 (17.3) | 31 (19.6) |
| More than half an hour's drive | 30 (17.3) | 23 (14.6) |
| Overseas | 9 (5.2) | 4 (2.5) |
| Not known | 1 (0.6) | 1 (0.6) |

About one-third (34.7%, n=60) of the participants lived with their closest person. This stayed constant at follow-up (table 6.8) and did not vary according to gender.

### 6.1.6.5   Second closest person

In the first questionnaire we also asked about the person they felt next closest to. Three-quarters of the sample (75.1%, n=130) identified a second person and women selected females for this role more frequently than men did (71.2% vs. 46.2%, $\chi^2(1)$=5.81, p=0.016). This was partly accounted by women selecting their sisters and men their brothers more frequently for this role, though this pattern was reversed for sons and daughters (table 6.9). Friends were selected most frequently by both men (30.8%, n=8) and women (37.5%, n=39).

**Table 6.9**      **Relationship with second closest person by gender at baseline**

| Relationship | Male n=26 (%) | Female n=104 (%) |
|---|---|---|
| Friend | 8 (30.8) | 39 (37.5) |
| Sister | 2 (7.7) | 18 (17.3) |
| Partner or spouse | 2 (7.7) | 12 (11.5) |
| Mother | 2 (7.7) | 11 (10.6) |
| Daughter | 3 (11.5) | 7 (6.7) |
| Brother | 4 (15.4) | 3 (2.9) |
| Son | 0 | 5 (4.8) |
| Father | 0 | 2 (1.9) |
| CPN / keyworker | 1 (3.8) | 1 (1.0) |
| Counsellor/therapist | 0 | 2 (1.9) |
| Cousin | 0 | 2 (1.9) |
| Uncle | 1 (3.8) | 0 |
| Son's partner | 0 | 1 (1.0) |
| Brother-in-law | 1 (3.8) | 0 |
| Mother-in-law | 1 (3.8) | 0 |
| Ex-partner | 0 | 1 (1.0) |
| Not known | 1 (3.8) | 0 |

Over half (55.1%, n=86) of the closest persons lived within walking distance of participants, but this reduced to just over a third (36.2%, n=47) of the second closest persons.

### 6.1.7    Social support

#### 6.1.7.1    Closest person

At baseline, women perceived that their closest person provided them with significantly more emotional support than men and this difference persisted at follow-up (table 6.10). There was no difference between men and women in the other domains at baseline though women perceived more negative interactions at follow-up than men (table 6.10). Overall scale scores did not change significantly over the two time points.

**Table 6.10        CPQ scale scores by gender for closest person**

| CPQ scale Baseline | Male (n=46) Mean (s.d.) | Female (n=121) Mean (s.d.) | t-test |
|---|---|---|---|
| Emotional | 9.74 (5.28) | 12.84 (4.91) | t(165)=-3.57, p<0.001 |
| Practical | 5.00 (3.79) | 5.50 (3.35) | ns |
| Negative | 2.98 (2.56) | 2.90 (2.11) | ns |
| CPQ scale Follow-up | Male (n=44) Mean (s.d.) | Female (n=114) Mean (s.d.) | t-test |
| Emotional | 9.39 (7.09) | 12.94 (5.08) | t(155)=-3.50, p<0.001 |
| Practical | 4.48 (3.90) | 5.56 (3.31) | ns |
| Negative | 1.86 (2.14) | 3.13 (2.23) | t(154)=-3.21, p=0.002 |

#### 6.1.7.2    Second closest person

At baseline, emotional support from the closest person was perceived to be greater than that from the next closest person (t(135)=7.18, p<0.0001). The practical support was also perceived to be greater (t(133)=6.74, p<0.0001), but there was no difference in negative interactions.

The gender differences in emotional support from the closest person persisted with the second closest person (table 6.11). There was also no difference in practical support between the genders. However, women perceived more negative interactions with their second closest person than men (table 6.11).

**Table 6.11    CPQ scale scores by gender for second closest person at baseline**

| CPQ scale | Male (n=32) Mean (s.d.) | Female (n=109) Mean (s.d.) | t-test |
|---|---|---|---|
| Emotional | 8.47 (5.24) | 11.28 (4.04) | t(139)=-3.22, p=0.002 |
| Practical | 3.39 (2.80) | 4.05 (2.89) | ns |
| Negative | 2.19 (2.19) | 3.17 (2.23) | t(139)=-2.21, p=0.029 |

### 6.1.7.3   Cumulative support

We compiled a cumulative index of perceived support provided by the two closest persons for the baseline data. We used weights that were derived by Fuhrer and Stansfeld (2002) from response patterns and sensitivity analysis in the Whitehall II study (cumulative index B: 1.0 for first person, 0.6 for second person). Women perceived more emotional support than men, but there were no differences in the practical and negative support scales by gender (table 6.12).

**Table 6.12    Cumulative CPQ scale scores at baseline by gender**

| CPQ scale | Male (n=46) Mean (s.d.) | Female (n=121) Mean (s.d.) | t-test |
|---|---|---|---|
| Emotional | 13.18 (7.68) | 18.70 (7.30) | t(165)=-4.30, p<0.001 |
| Practical | 6.46 (4.55) | 7.52 (4.31) | ns |
| Negative | 3.91 (3.39) | 4.52 (2.89) | ns |

### 6.1.8   Attachment style

A fearful attachment style was the most prevalent at both baseline (41.6%) and follow-up (38.0%) (table 6.13). This possibly reflected the high prevalence of anxiety in the sample. At follow-up, secure and dismissing attachment styles became more prevalent at the expense of preoccupied and fearful (table 6.13). Participants' attachment styles did not vary according to gender in our sample but were otherwise similar to those in other samples of people with depression (e.g. Bifulco et al., 2002a).

By recoding dismissing, preoccupied and fearful as 'insecure', the changes in attachment styles between baseline and follow-up became clearer. There was only a small trend towards increasingly secure attachments (table 6.14) and there was moderately high agreement between both time points (kappa=0.65, p<0.0001).

**Table 6.13**      **Attachment style**

| Attachment style | Baseline n=173 (%) | Follow-up n=158 (%) |
|---|---|---|
| Secure | 27 (15.6) | 33 (20.9) |
| Dismissing | 34 (19.7) | 43 (27.2) |
| Preoccupied | 34 (19.7) | 20 (12.7) |
| Fearful | 72 (41.6) | 60 (38.0) |
| Not known | 6 (3.5) | 2 (1.3) |

**Table 6.14**      **Secure/insecure attachment style at baseline and follow-up**

| Attachment style at baseline | Attachment style at follow-up | | Total |
|---|---|---|---|
| | Secure | Insecure | |
| Secure | 20 | 5 | 25 |
| Insecure | 11 | 116 | 127 |
| Total | 31 | 121 | 152 |

## 6.1.9   Access to social capital

### 6.1.9.1   RG-UK

At baseline, participants had access to fewer social resources across all the domains of the RG-UK than in our second general population sample (n=335, chapter 4) (table 6.15). Also, the participants had access to less social capital in all but one sub-scale of the RG-UK than those who were GHQ cases in the general population pilot sample (table 6.16). However, in comparison with two samples of people with severe mental health problems such as schizophrenia or bi-polar affective disorder (Dutt, 2008; Murray et al., 2007), participants in our study had access to more social capital in all sub-scales except for problem solving resources (table 6.16).

**Table 6.15**      **RG-UK comparison with general population sample**

| RG-UK scale | Baseline (n=173) mean (s.d.) | Difference from general population means (n=335) (95% CI) | t-test |
|---|---|---|---|
| RG-UK total scale | 13.10 (6.15) | -4.14 (-5.31 to -2.97) | t(436)=-6.98, p<0.0001 |
| Domestic | 3.78 (1.94) | -1.11 (-1.46 to -0.76) | t(485)=-6.19, p<0.0001 |
| Expert advice | 3.99 (2.41) | -1.26 (-1.73 to -0.79) | t(463)=-5.32, p<0.0001 |
| Personal skills | 2.54 (1.75) | -1.12 (-1.44 to -0.80) | t(485)=-6.95, p<0.0001 |
| Problem solving | 2.83 (1.24) | -0.50 (-0.71 to -0.29) | t(486)=-4.64, p<0.0001 |

There was a small negative correlation of the RG-UK and HAD-D (r=-0.26, p=0.001), but none with HAD-A.

**Table 6.16      RG-UK comparison with other clinical samples**

| RG-UK scale | SAFIRE baseline (n=173) mean (s.d.) | GHQ case in phase two pilot[a] (n=91) mean (s.d.) | Punjabi women with SMI[b] (n=52) mean (s.d) | Volunteers with SMI[c] (n=150) mean (s.d.) |
|---|---|---|---|---|
| RG-UK total scale | 13.10 (6.15) | 16.44 (5.65)*** | 11.31 (6.60) | 10.82 (5.77)** |
| Domestic | 3.78 (1.94) | 4.70 (1.83)*** | 3.54 (2.24) | 2.71(1.88)*** |
| Expert advice | 3.99 (2.41) | 5.20 (2.47)*** | 2.96 (2.31)** | 3.67(2.75) |
| Personal skills | 2.54 (1.75) | 3.46 (1.70)*** | 1.96 (1.57)* | 2.09(1.46)* |
| Problem solving | 2.83 (1.24) | 3.09 (0.96) | 2.85 (1.53) | 2.61(1.28) |

[a] See section 4.4.7
[b] From Dutt (2008)
[c] From Murray et al. (2007)
*p<0.05, **p<0.01, ***p<0.001

Unlike the general population sample (chapter 4), where there was no differences between the genders, women had access to more resources than men across all domains (table 6.17). This difference persisted across all domains except personal skills at follow-up.

**Table 6.17      RG-UK scores by gender at baseline and follow-up**

| RG-UK scale Baseline | Male (n=47) mean (s.d.) | Female (n=126) mean (s.d.) | Difference in means (95% CI) | t-test |
|---|---|---|---|---|
| RG-UK total scale | 10.50 (5.99) | 14.07 (5.94) | -3.57 (-5.65 to -1.49) | t(160)=-3.39, p<0.001 |
| Domestic | 3.16 (1.98) | 4.01 (1.89) | -0.85 (-1.51 to -0.20) | t(168)=-2.56, p=0.011 |
| Expert advice | 2.91 (2.29) | 4.39 (2.34) | -1.48 (-2.28 to -0.67) | t(164)=-3.64, p<0.001 |
| Personal skills | 1.98 (1.53) | 2.76 (1.79) | -0.78 (-1.37 to -0.19) | t(167)=-2.61, p=0.010 |
| Problem solving | 2.49 (1.31) | 2.95 (1.20) | -0.46 (-0.88 to -0.04) | t(167)=-2.17, p=0.031 |
| **RG-UK scale Follow-up** | **Male (n=44) mean (s.d.)** | **Female (n=114) mean (s.d.)** | **Difference in means (95% CI)** | |
| RG-UK total scale | 11.11 (6.65) | 14.97 (5.73) | -3.86 (-5.97 to -1.75) | t(154)=-3.62, p<0.001 |
| Domestic | 3.16 (2.15) | 4.43 (1.86) | -1.27 (-1.95 to -0.59) | t(156)=-3.68, p<0.001 |
| Expert advice | 3.23 (2.57) | 4.64 (2.14) | -1.41 (-2.21 to -0.61) | t(155)=-3.50, p<0.001 |
| Personal skills | 2.30 (1.80) | 2.81 (1.64) | -0.51 (-1.10 to 0.08) | t(155)=-1.71, p=0.090 |
| Problem solving | 2.43 (1.21) | 3.17 (1.14) | -0.74 (-1.14 to -0.33) | t(155)=-3.57, p<0.001 |

There was no significant change in RG-UK scores between the two time points, though there was a non-significant trend towards an increase in access to resources over time (table 6.18).

**Table 6.18          Changes in Resource Generator-UK at follow-up**

| RG-UK scale | Follow-up (n=158) mean (s.d.) | Difference from baseline means (n=173) (95% CI) | t-test |
|---|---|---|---|
| RG-UK total scale | 13.88 (6.23) | 0.70 (-0.06 to 1.45) | t(148)=1.83, p=0.070 |
| Domestic | 4.08 (2.02) | 0.23 (-0.05 to 0.51) | ns |
| Expert advice | 4.24 (2.35) | 0.21 (-0.10 to 0.52) | ns |
| Personal skills | 2.66 (1.69) | 0.16 (-0.05 to 0.38) | ns |
| Problem solving | 2.96 (1.20) | 0.11 (-0.06 to 0.28) | ns |

Study participants were more likely to have access to resources from strong ties such as immediate family members or friends (table 6.19). For example, the average proportion of items in the RG-UK scale that were accessible from family and friends was 49% and 38% respectively, in contrast to neighbours (9%) and acquaintances (12%). However, there was some sub-scale variation with a higher proportion of expert advice and personal skills resources being accessible through non-kin.

There was very little change at follow-up in the strength of tie that resources were accessible from (table 6.19). The largest difference was an overall increase in resources accessible from acquaintances at follow-up, particularly in the expert advice and problem solving domains. As there were no other increases in the other relationship categories, it is possible that the increased access to resources from acquaintances could be connected to the non-significant trend of increasing access to resources over time.

**Table 6.19        Mean proportions of RG-UK scale items accessible by strength of tie at baseline and follow-up**

| RG-UK scale Baseline | n | % Accessible through immediate family mean (s.d.) | % Accessible through wider family mean (s.d.) | % Accessible through friend mean (s.d.) | % Accessible through neighbour mean (s.d) | % Accessible through colleague mean (s.d.) | % Accessible through acquaintance mean (s.d.) |
|---|---|---|---|---|---|---|---|
| RG-UK total scale | 142 | 48.55 (30.52) | 10.99 (17.98) | 37.70 (30.70) | 8.83 (15.85) | 11.06 (18.35) | 11.99 (18.78) |
| Domestic | 144 | 57.48 (36.33) | 13.19 (26.43) | 34.48 (35.98) | 12.38 (21.40) | 4.02 (15.27) | 6.92 (15.52) |
| Expert advice | 141 | 38.69 (34.35) | 10.19 (19.17) | 44.36 (37.82) | 6.42 (16.12) | 19.93 (28.72) | 15.03 (26.25) |
| Personal skills | 135 | 34.46 (34.31) | 9.81 (20.38) | 34.56 (36.33) | 8.17 (20.31) | 9.28 (20.03) | 17.60 (27.11) |
| Problem solving | 147 | 61.64 (38.19) | 10.91 (22.99) | 37.77 (36.61) | 9.82 (22.27) | 9.84 (22.12) | 10.88 (23.32) |
| **Follow-up** | | | | | | | |
| RG-UK total scale | 149 | 47.51 (28.96) | 8.74 (14.97)* | 35.50 (27.82) | 8.17 (13.68) | 9.07 (15.21) | 17.80 (22.95)** |
| Domestic | 145 | 56.43 (36.59) | 9.51 (21.73) | 34.65 (34.72) | 13.66 (23.25) | 2.63 (10.34) | 9.49 (20.02) |
| Expert advice | 146 | 37.66 (33.91) | 10.66 (20.71) | 39.81 (34.33)* | 4.77 (13.87) | 19.75 (28.74) | 22.15 (32.05)* |
| Personal skills | 134 | 37.70 (35.57) | 9.51 (19.60) | 32.60 (36.89) | 7.05 (17.74) | 6.07 (15.76) | 24.60 (31.47)* |
| Problem solving | 148 | 60.98 (34.92) | 8.86 (21.40) | 36.61 (34.96) | 9.99 (21.91) | 6.89 (17.58)* | 11.48 (21.75) |

**Differences between baseline and follow-up:**

*p<0.05

**p<0.01

### 6.1.9.2 Human capital

At baseline, respondents indicated that they personally possessed a mean of 2.17 (95%CI=1.90-1.25) (s.d.=1.81) resources out of the first 13 on the RG-UK scale. This was a mean difference of 0.99 (95%CI=0.60-1.37) fewer resources than the general population sample (chapter 4) (t(484)=5.00, p<0.0001).

Personal resources did not change between time points, but a small gender difference emerged at follow-up that was not present at baseline. At follow-up men in the sample possessed on average of 0.81 (95%CI=0.01-1.61) resources more than women (t(60.56)=2.02, p=0.048).

### 6.1.9.3 PG-UK

Participants had access to fewer occupations than the general population across all domains (table 6.20). However, there was no correlation between HAD scores and the PG-UK.

**Table 6.20      PG-UK comparison with general population**

| PG-UK scale | Baseline (n=173) mean (s.d.) | Difference from general population means (n=335) (95% CI) | t-test |
|---|---|---|---|
| PG-UK total scale | 4.61 (3.23) | -2.75 (-3.45 to -2.05) | t(482)=-7.72, p<0.0001 |
| Professional | 1.56 (1.44) | -0.50 (-0.77 to -0.23) | t(484)=-3.61, p<0.001 |
| Skilled | 1.30 (1.15) | -0.58 (-0.81 to -0.35) | t(494)=-4.90, p<0.0001 |
| Low skilled | 0.51 (0.71) | -0.78 (-0.94 to -0.62) | t(496)=-9.37, p<0.0001 |
| Food chain | 0.51 (0.66) | -0.50 (-0.67 to -0.33) | t(500)=-5.86, p<0.0001 |

At baseline, as in the RG-UK, women had access to more occupations than men in the PG-UK (difference in means=1.34 (95%CI=0.24-2.43), t(168)=2.41, p=0.017). However, of the sub-scales, this difference was only apparent in the professional occupations sub-scale (difference in means=0.79 (95%CI-=0.31-1.27), t(169)=3.26, p=0.001). The difference between genders increased at follow-up and extended into all the sub-scales except for the low skilled occupations (table 6.21).

**Table 6.21        Position Generator-UK follow-up scores by gender**

| RG-UK scale | Male (n=44) mean (s.d.) | Female (n=114) mean (s.d.) | Difference in means (95% CI) | t-test |
|---|---|---|---|---|
| PG-UK total scale | 3.70 (2.94) | 5.50 (3.33) | -1.80 (-2.93 to -0.67) | t(156)=-3.14, p=0.002 |
| Professional | 1.11 (1.20) | 1.85 (1.34) | -0.74 (-1.19 to -0.28) | t(156)=-3.19, p=0.002 |
| Skilled | 1.02 (1.00) | 1.54 (1.20) | -0.51 (-0.91 to -0.11) | t(156)=-2.52, p=0.013 |
| Low skilled | 0.57 (0.70) | 0.64 (0.74) | -0.07 (-0.33 to 0.18) | ns |
| Food chain | 0.32 (0.52) | 0.63 (0.67) | -0.31 (-0.53 to -0.09) | t(156)=-2.80, p=0.006 |

There were no differences between the baseline and follow-up scores in the PG-UK scale or any of its sub-scales.

The strength of ties that occupations were accessed from was weaker than the RG-UK. For example, only 19% of occupations were accessible from immediate family in contrast to 27% from acquaintances (table 6.22). Friends were the most frequent source of occupations across all sub-scales. There were no changes over the six months. However, due to some missing data on strength of ties the low skilled and food chain sub-scales had smaller samples which limited our ability to detect any significant differences.

**Table 6.22        Mean proportions of PG-UK occupations known by strength of tie at baseline and follow-up**

| PG-UK scale<br>Baseline | n | % Immediate family<br>mean (s.d.) | % Wider family<br>mean (s.d.) | % Friend<br>mean (s.d.) | % Neighbour<br>mean (s.d) | % Colleague<br>mean (s.d.) | % Acquaintance<br>mean (s.d.) |
|---|---|---|---|---|---|---|---|
| PG-UK total scale | 138 | 18.60 (25.09) | 13.30 (21.98) | 35.86 (29.39) | 4.41 (10.53) | 11.45 (19.44) | 27.04 (28.99) |
| Professional | 107 | 16.88 (30.75) | 9.25 (20.91) | 36.36 (38.08) | 3.80 (13.81) | 14.02 (28.47) | 33.29 (39.61) |
| Skilled | 116 | 20.36 (35.90) | 14.87 (31.16) | 36.39 (41.08) | 3.59 (17.00) | 13.22 (30.81) | 25.22 (36.91) |
| Low skilled | 66 | 15.15 (35.05) | 9.09 (26.18) | 37.12 (44.99) | 8.33 (27.15) | 18.18 (37.86) | 28.79 (42.12) |
| Food chain | 68 | 13.97 (34.39) | 13.73 (31.93) | 36.76 (47.01) | 5.15 (21.41) | 5.15 (21.41) | 34.07 (45.39) |
| **Follow-up** | | | | | | | |
| PG-UK total scale | 140 | 18.49 (25.39) | 13.08 (19.99) | 37.48 (30.39) | 4.97 (10.99) | 9.48 (16.22) | 29.74 (30.63) |
| Professional | 117 | 16.51 (32.15) | 13.76 (29.31) | 38.02 (40.18) | 3.77 (11.86) | 12.35 (27.83) | 34.03 (40.09) |
| Skilled | 118 | 19.70 (34.50) | 12.78 (27.36) | 36.79 (40.21) | 6.36 (22.85) | 10.17 (25.02) | 26.20 (38.25) |
| Low skilled | 76 | 21.71 (39.54) | 11.18 (30.11) | 42.98 (46.45) | 9.21 (27.94) | 11.84 (31.48) | 26.10 (41.93) |
| Food chain | 71 | 14.08 (34.00) | 11.97 (31.01) | 35.92 (47.19) | 2.82 (14.36) | 7.04 (24.34) | 33.80 (44.54) |

### 6.1.10 Quality of life

At baseline, the quality of life domain of the MANSA (Priebe et al., 1999) where participants scored the highest was living situation (table 6.23). This domain comprised an average score of satisfaction with people they lived with and accommodation. Participants were least satisfied with their health (both physical and mental) and finances. There were no differences according to gender at baseline or follow-up in any quality of life domain.

All except three domains saw improvements in subjective quality of life between baseline and follow-up (table 6.23). The exceptions were the leisure, living situation and family domains. Similar improvements in subjective quality of life have been found in other longitudinal studies of people with mental health problems (Evans et al., 2007; Ruggeri et al., 2005).

**Table 6.23**      **Quality of life domain scores at baseline and follow-up**

| QoL domain | Baseline (n=173) mean (s.d.) | Follow-up (n=158) mean (s.d.) | Paired t-test |
|---|---|---|---|
| Life overall | 3.22 (1.24) | 3.49 (1.37) | t(153)=2.33, p=0.021 |
| Health | 3.13 (1.12) | 3.38 (1.29) | t(155)=2.70, p=0.008 |
| Work | 3.66 (1.61) | 3.85 (1.67) | t(155)=2.12, p=0.036 |
| Finance | 3.13 (1.57) | 3.45 (1.66) | t(156)=3.20, p=0.002 |
| Leisure | 3.25 (1.33) | 3.42 (1.44) | ns |
| Social | 4.14 (1.57) | 4.45 (1.57) | t(154)=3.13, p=0.002 |
| Living situation | 4.70 (1.41) | 4.84 (1.48) | ns |
| Family | 4.45 (1.57) | 4.54 (1.51) | ns |
| Safety | 4.27 (1.51) | 4.52 (1.25) | t(155)=2.25, p=0.026 |

Across each quality of life domain our sample were more dissatisfied than people without a common mental disorder (Brugha and Evans, 2003). To further explore the low subjective quality of life within our sample, we compared the baseline domain ratings with those of a healthy population, a group with common mental disorders and one with severe psychosis as reported in Evans et al. (2007). The healthy population and common mental disorder groups were derived from a study of urban regeneration in south Manchester (Huxley et al., 2004; Thomas et al., 2002) and the severe psychosis group was from the Manchester site of the UK700 trial of case management (Burns et al., 1999).

The subjective quality of life of our sample was lower than the healthy general population sample across each domain (table 6.24). It was lower than the common mental disorder group in the life overall, health, social, living situation and family domains and was even lower than the severe psychosis group in the life overall, health, finance and leisure domains. In no domain was the mean subjective quality of life significantly higher than any of the comparison groups.

**Table 6.24      Subjective quality of life by population group**

| QoL domain | SAFIRE sample at baseline (n=173) Mean (s.d.) | Healthy population (n=1119) mean (s.d.) | Common mental disorder (n=794) mean (s.d.) | Severe psychosis group (n=149) mean (s.d.) |
|---|---|---|---|---|
| Life overall | 3.22 (1.24) | 5.06 (0.67)*** | 4.23 (0.86)*** | 4.18 (0.79)*** |
| Health | 3.13 (1.12) | 5.67 (0.86)*** | 4.45 (1.31)*** | 4.05 (1.34)*** |
| Work | 3.64 (1.63) | 4.77 (1.46)*** | 3.81 (1.69) | 3.73 (1.69) |
| Finance | 3.13 (1.57) | 4.02 (1.41)*** | 2.91 (1.57) | 3.51 (1.58)* |
| Leisure | 3.25 (1.33) | 4.40 (1.29)*** | 3.47 (1.51) | 4.46 (1.31)*** |
| Social | 4.14 (1.57) | 5.39 (1.20)*** | 4.67 (1.70)*** | 4.38 (1.51) |
| Living situation | 4.70 (1.41) | 5.60 (0.91)*** | 5.00 (1.24)** | 4.59 (1.45) |
| Family | 4.45 (1.57) | 5.95 (1.02)*** | 5.36 (1.45)*** | 4.59 (1.34) |
| Safety | 4.27 (1.51) | 4.64 (1.00)** | 4.09 (1.21) | 4.32 (1.52) |

Differences between SAFIRE baseline:
* p<0.05, **p<0.01, ***p<0.001

## 6.2   Attrition bias

To assess for attrition bias we compared the baseline data of those who completed the study (n=158) with those who dropped out (n=15). We found that those who dropped out were less likely to be owner-occupiers than those who completed the study (15.4% vs. 61.8%, $\chi^2(1)=10.63$, p=0.001). It is possible that those in less secure accommodation that dropped out had moved during the study period and did not provide a forwarding address, making follow-up impossible. This was the only variable associated with loss to follow-up and we can be confident that our results are not unduly affected by attrition bias.

## 6.3   Primary Hypothesis

The primary hypothesis was that depression scores, as measured by the depression subscale of the Hospital Anxiety and Depression scale (HAD-D) (Zigmond and Snaith,

1983), will decrease significantly more for people with access to more social capital, as measured by the Resource Generator-UK, over the study period of six months, after controlling for potential confounding variables.

### 6.3.1    Univariate analysis

#### 6.3.1.1    Change in depression scores

Over the study period, the sample (n=158) improved by a mean of 2.58 (s.d.=3.54) points on the HAD-D scale. The change in HAD-D scores had a normal distribution (figure 6.1).

**Figure 6.1        Histogram of change in HAD-D scores**
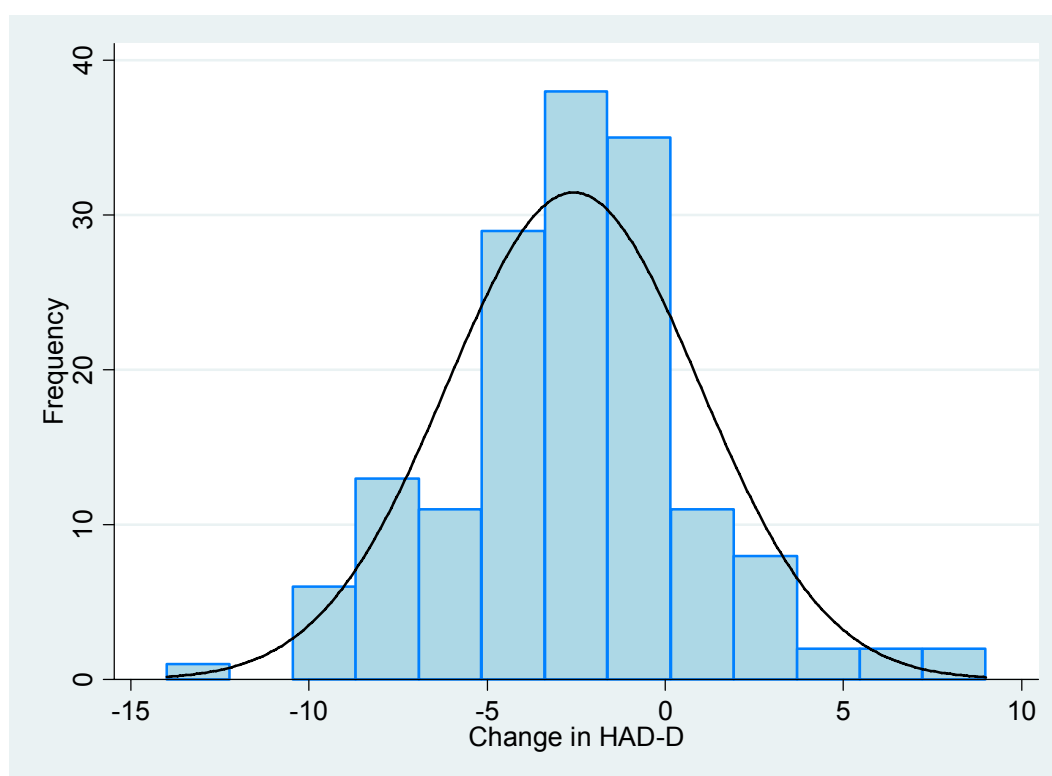


To identify potential variables for inclusion in the regression model on change in depression scores we first explored univariate associations.

#### 6.3.1.2    Access to social capital

We hypothesised that access to social capital at baseline would be associated with improvements in depression at follow-up. We found a weak negative correlation between the expert advice domain of the RG-UK at baseline and change in depression

scores (table 6.25). A small negative correlation existed between the PG-UK scale at baseline and change in HAD-D scores, but for none of its individual sub-scales (table 6.25). As the correlation was strongest with the RG-UK scale, we chose not to enter the PG-UK into the multivariate model.

**Table 6.25    Change in HAD-D scores by access to social capital**

| Variable | n | Correlation |
|---|---|---|
| **RG-UK (baseline)** | | |
| RG-UK scale | 150 | ns |
| Domestic | 156 | ns |
| Expert advice | 153 | r=-0.21, p=0.009 |
| Personal skills | 156 | ns |
| Problem solving | 155 | ns |
| **PG-UK (baseline)** | | |
| PG-UK scale | 156 | r=-0.17, p=0.040 |
| Professional occupations | 157 | ns |
| Skilled occupations | 156 | ns |
| Low skilled occupations | 157 | ns |
| Food chain occupations | 157 | ns |

### 6.3.1.3   Human capital

There was a negative correlation (r=-0.23, p=0.004) between the human capital scale in the RG-UK at baseline and change in depression scores, indicating that it was also important to include it in the multivariate model. This would help us to adjust for the effect of personal possession of resources on the relationship between access to social capital and change in depression scores.

### 6.3.1.4   Socio-demographic variables

Women did not improve significantly more than men over the six months between baseline and follow-up (table 6.26). There was also no correlation with age or difference according to marital status. There was no difference according to participants' ethnicity, but the study was underpowered to detect this.

Table 6.26      Change in HAD-D scores by socio-demographic status

| Variable | n | Change in HAD-D mean (sd) | Correlation / t-test / F-Test |
|---|---|---|---|
| **Sex** | | | ns |
| Male | 44 | -2.43 (4.02) | |
| Female | 114 | -2.63 (3.36) | |
| **Age** | 157 | | ns |
| **Ethnicity** | | | ns |
| White British | 132 | -2.48 (3.41) | |
| White other | 12 | -3.83 (2.98) | |
| Black | 2 | -4.5 (4.95) | |
| Asian | 6 | -3.33 (5.82) | |
| Mixed | 6 | -0.83 (4.67) | |
| **Marital status** | | | ns |
| Single | 42 | -2.40 (3.28) | |
| Married / co-habiting | 85 | -2.82 (3.72) | |
| Divorced | 27 | -2.30 (3.46) | |
| Widowed | 4 | -1.00 (3.65) | |

### 6.3.1.5   Socio-economic variables

Education was the strongest predictor of change in depression scores of the socio-economic variables we measured (table 6.27). Participants in the top three occupational groups (Office for National Statistics, 2000) and those with higher household income also improved more over the six months (table 6.27).

Of the three socio-economic candidates for inclusion in the multivariate model, education was the variable with the least missing data (n=5). When transformed into a binary variable (with/without degree), the effect of having a degree on change in depression scores became even more apparent (table 6.27). A limitation of using education as a sole indicator of socio-economic status is that it may relate more to parental social class than to current social position (Sacker et al., 2002). Income may be a more sensitive indicator of socio-economic status than education (e.g. Duncan et al., 2002). However, a limitation of using household income as a measure of socio-economic status is that it does not account for female disadvantage in resource sharing in households (Volger and Pahl, 1994). Further, associations between income and health may be explained by reverse causality as current income may be a product of recent health. However, we also selected income for inclusion in the multivariate model

because of its marginally non-significant association with change in HAD-D scores and
its numerous correlations with other variables selected for the model (table 6.31).

**Table 6.27      Change in HAD-D scores by socio-economic status**

| Variable | n | Change in HAD-D mean (sd) | Correlation / t-test / F-Test |
|---|---|---|---|
| **Primary Care Trust** | | | ns |
| Kingston | 29 | -3.79 (3.85) | |
| Richmond & Twickenham | 69 | -2.29 (3.49) | |
| Sutton & Merton | 60 | -2.32 (3.39) | |
| **Living situation** | | | ns |
| Owner occupier | 97 | -2.94 (3.27) | |
| Rented | 47 | -2.04 (4.06) | |
| Living with family / carer | 7 | -1.71 (2.29) | |
| Sheltered housing | 1 | -1.00 | |
| Temporary accommodation | 5 | -2.60 (5.41) | |
| Not known | 1 | 0 | |
| **Employment status** | | | ns |
| Employed / self-employed | 72 | -3.11 (3.52) | |
| Student | 2 | -3.50 (2.12) | |
| Unemployed | 16 | -1.31 (5.20) | |
| Retired | 19 | -2.16 (2.93) | |
| Looking after the home | 10 | -3.20 (3.76) | |
| Carer | 1 | -5.00 | |
| Unable to work due to disability or ill-health | 38 | -2.03 (2.99) | |
| **Social class grouping** | | | F=3.15, p=0.047 |
| SOC 1-3 | 43 | -3.77 (3.72) | |
| SOC 4-6 | 44 | -1.91 (3.67) | |
| SOC 7-9 | 19 | -2.00 (3.68) | |
| Not known | 52 | -2.37 (3.07) | |
| **Education** | | | F=2.52, p=0.044 |
| No formal qualifications | 38 | -2.05 (3.75) | |
| CSE/GCSE or equivalent | 46 | -2.65 (3.09) | |
| A level or equivalent | 25 | -1.20 (3.67) | |
| Degree | 32 | -3.84 (3.64) | |
| Postgraduate degree | 12 | -3.67 (3.47) | |
| Not known | 5 | -2.00 (2.74) | |
| **Education (binary)** | | | t=2.69, p=0.008 |
| Without degree | 109 | -2.11 (3.48) | |
| With degree | 44 | -3.80 (3.55) | |
| **Household income per month** | 130 | | r=-0.16[a], p=0.069 |

[a] Spearman's rank correlation coefficient

Our social class variable was based upon current or recent employment and substantial missing data reduced its usefulness. Further, it is important to note that social class (based on occupation) has inconsistent associations with common mental disorder (Fryers et al., 2003).

### 6.3.1.6   Health

There was a weak negative correlation between baseline HAD-D and change in HAD-D, indicating that those with higher depression scores at baseline improved more (table 6.28). There was a non-significant trend towards an opposite correlation for HAD-A, indicating that those with lower anxiety scores at baseline improved more. Having either a family history or previous episodes of depression was not associated with change in HAD-D. However, the length of current episode was positively correlated with improvement over the six months (table 6.28). There was no association between physical health and change in depression scores.

**Table 6.28       Change in HAD-D scores by mental health status**

| Variable | n | Change in HAD-D mean (sd) | Correlation / t-test / F-Test |
|---|---|---|---|
| **Baseline HAD scores** | | | |
| Anxiety | 158 | | r= 0.15, p=0.067 |
| Depression | 158 | | r= -0.17, p=0.037 |
| **Family history of depression** | | | ns |
| Yes | 77 | -2.38 (3.46) | |
| No | 76 | -2.86 (3.67) | |
| **Previous episodes of depression** | | | ns |
| None | 45 | -2.56 (3.22) | |
| 1 | 18 | -4.11 (2.49) | |
| >1 | 95 | -2.29 (3.81) | |
| **Length of current episode (years)** | 150 | | r= 0.17[a], p=0.033 |

[a] Spearman's rank correlation coefficient

None of the treatment variables at baseline or follow-up were associated with change in depression scores (table 6.29). However, there were marginally non-significant differences between the groups receiving different treatments during follow-up with those taking only anti-depressants at follow-up improving less than those receiving psychological therapy either alone or in combination with anti-depressants.

**Table 6.29        Change in HAD-D scores by treatment**

| Variable | n | Change in HAD-D mean (sd) | t-test / F-Test |
|---|---|---|---|
| **Treatments receiving (baseline)** | | | ns |
| None | 25 | -3.44 (2.80) | |
| Anti-depressants | 90 | -2.53 (3.77) | |
| Therapy only | 4 | -3.25 (1.89) | |
| Anti-depressants plus therapy | 26 | -2.77 (3.61) | |
| Other or undefined | 10 | -1.30 (2.58) | |
| Missing | 3 | 1.67 (3.79) | |
| **Treatments receiving (follow-up)** | | | F=2.34, p=0.058 |
| None | 48 | -3.27 (3.34) | |
| Anti-depressants | 89 | -1.92 (3.55) | |
| Therapy only | 2 | -6.50 (0.71) | |
| Anti-depressants plus therapy | 16 | -3.75 (3.82) | |
| Other or undefined | 2 | -2.50 (2.12) | |
| Missing | 1 | -1.00 | |
| **Secondary care (baseline)** | | | ns |
| Yes | 9 | -1.33 (2.50) | |
| No | 146 | -2.74 (3.54) | |
| **Secondary care (follow-up)** | | | ns |
| Yes | 11 | -1.54 (2.20) | |
| No | 146 | -2.66 (3.63) | |

### 6.3.1.7   Life events

There was no correlation between the number of life events in the six months preceding baseline or follow-up and change in depression scores. This is in contrast to an established literature. For example, Friis et al (2002) found that the total number of life events young adults experienced was a risk factor for the chronicity of depression and Mundt et al. (2000) found that the number of life events was the best predictor of depression scores at follow-up in a sample of people with severe depression. Our finding possibly occurred because the LTE did not apportion weights to different life events and did not capture their meaning for individual participants.

There was no difference in improvement scores according to the number of children aged under 16 living with the participant at baseline, suggesting that it did not act as a vulnerability factor within this sample.

### 6.3.1.8 Social networks

None of the social network variables were associated with change in depression scores. In particular, having a larger network of close people or having more frequent contact with friends or relatives did not significantly affect depression scores.

### 6.3.1.9 Social support

Perceived emotional support during follow-up was negatively correlated with change in depression scores (r=-0.24, p=0.002). As this was the only CPQ scale score with a significant correlation with changes in depression scores at baseline or follow-up, we selected it for inclusion in the multivariate model.

**Table 6.30    Change in HAD-D scores by attachment styles**

| Variable | n | Change in HAD-D mean (sd) | t-test / F-Test |
|---|---|---|---|
| **Four categories (baseline)** | | | F=2.23, p=0.087 |
| Secure | 25 | -4.08 (3.23) | |
| Dismissing | 30 | -2.03 (3.41) | |
| Pre-occupied | 32 | -2.84 (3.35) | |
| Fearful | 67 | -2.10 (3.73) | |
| Not known | 4 | -3.00 (3.56) | |
| **Four categories (follow-up)** | | | F=3.68, p=0.014 |
| Secure | 33 | -4.03 (2.98) | |
| Dismissing | 43 | -2.95 (3.27) | |
| Pre-occupied | 20 | -1.55 (3.15) | |
| Fearful | 60 | -1.80 (3.93) | |
| Not known | 2 | -4.00 (1.41) | |
| **Two categories (baseline)** | | | t(152)=-2.36, p=0.019 |
| Secure | 25 | -4.08 (3.23) | |
| Insecure | 129 | -2.27 (3.55) | |
| **Two categories (follow-up)** | | | t(154)=-2.73, p=0.007 |
| Secure | 33 | -4.03 (2.98) | |
| Insecure | 123 | -2.16 (3.61) | |

### 6.3.1.10 Attachment styles

Using Bartholomew and Horowitz's (1991) four-category model, attachment style at baseline did not predict change in depression scores (table 6.30). However, there was

a non-significant trend towards secure attachments being associated with higher decreases in depression scores, which reached significance when compared with attachment style at follow-up. This pattern became clearer by collapsing the categories into secure and insecure, with secure attachments being associated with greater improvement over the six month period (table 6.30). As the binary attachment styles at baseline were potential predictors of change in depression scores, we selected this for our multivariate model.

### 6.3.1.11 Quality of life

None of the subjective quality of life domains at baseline were associated with change in depression scores at follow-up.

### 6.3.1.12 Correlation matrix

There were numerous inter-correlations amongst the variables selected for the multivariate analysis (table 6.31). The majority were modest in strength, though the strong correlation between the expert advice subscale of the RG-UK and the RG-UK total scale indicated that they must not be entered into regression models together. Although income did not have a linear association with change in depression scores, it was correlated with all the other variables, indicating its potential importance in the regression model. The low-moderate correlations between variables suggest that multi-collinearity is not an issue here.

**Table 6.31    Correlation matrix of variables associated with change in HAD-D**

| | Change in HAD-D[a] | HAD-D[b] | HAD-A[b] | Length of depression episode[b,c] | RG-UK[b] | Expert advice (RG-UK)[b] | Human capital (RG-UK)[b] | Education[bd] | Income[c] | Emotional support (CPQ)[e] | Attachment style[b,d] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Change in HAD-D[a]** | 1 | | | | | | | | | | |
| **HAD-D[b]** | **-0.167*** | 1 | | | | | | | | | |
| **HAD-A[b]** | 0.146 | **0.410\*\*\*** | 1 | | | | | | | | |
| **Length of depression episode[b,c]** | **0.171*** | 0.126 | 0.024 | 1 | | | | | | | |
| **RG-UK[b]** | -0.113 | **-0.256\*\*** | -0.005 | -0.118 | 1 | | | | | | |
| **Expert advice (RG-UK)[b]** | **-0.210\*\*** | **-0.190*** | 0.041 | -0.117 | **0.889\*\*\*** | 1 | | | | | |
| **Human capital (RG-UK)[b]** | **-0.232\*\*** | -0.066 | -0.020 | -0.143 | **0.349\*\*\*** | **0.418\*\*\*** | 1 | | | | |
| **Education[b,d]** | **-0.214\*\*** | **-0.250\*\*** | **-0.187*** | -0.085 | **0.263\*\*\*** | **0.344\*\*\*** | **0.377\*\*\*** | 1 | | | |
| **Income[c]** | -0.162 | **-0.404\*\*\*** | **-0.224\*\*** | **-0.217*** | **0.438\*\*\*** | **0.455\*\*\*** | **0.303\*\*\*** | **0.429\*\*\*** | 1 | | |
| **Emotional support (CPQ)[e]** | **-0.242\*\*** | **-0.328\*\*\*** | -0.114 | **-0.195*** | **0.433\*\*\*** | **0.393\*\*\*** | 0.027 | **0.173*** | **0.344\*\*\*** | 1 | |
| **Attachment style[b,d]** | **0.189*** | 0.104 | **-0.321\*\*\*** | -0.087 | 0.149 | **0.197*** | **0.165*** | **0.206\*\*** | **0.176*** | **-0.289\*\*\*** | 1 |

[a] HAD-D$_{t2}$ – HAD-D$_{t1}$    [b] Baseline    [c] Log transformed    [d] Binary variable    [e] During follow-up

* $p<0.05$, **$p<0.01$, ***$p<0.001$

## 6.3.2   Multivariate analysis

### 6.3.2.1   Analysis of covariance

The association between the RG-UK expert advice sub-scale and the residual change in HAD-D scores, controlling for baseline HAD-D scores, formed the basis for our multivariate linear regression model. The other variables with univariate associations with our outcome (table 6.31) were then entered individually into the model. The association between the expert advice sub-scale and change in HAD-D scores remained significant when each variable was included individually. This process was repeated for the RG-UK scale. For each model we tabulated the Akaike Information Criterion (AIC) (Akaike, 1974) (Appendix E, table E1) to evaluate which combination of variables best explained the variance in change in HAD-D scores.

The association between the RG-UK expert advice subscale and change in HAD-D scores became non-significant when the emotional support and education variables were included individually in combination with any fourth variable. This indicated that these combinations of variables confounded the univariate association of our hypothesised predictor and outcome.

As we found that the RG-UK scale explained more of the variance in HAD-D scores than the expert advice subscale alone, we retained it in the analysis (Appendix E, table E1). In fact, it appeared in the best fit linear regression model for our primary outcome which included all nine variables with univariate associations (table 6.32). Although the RG-UK had a non-significant association with the outcome, the regression model explained more of the variance in change in HAD-D scores with it included. Total variance explained was 29% (table 6.32).

**Table 6.32**     **Linear regression model for change in HAD-D at follow-up**

| Variable | b (95%CI) | Standardised b | p-value |
|---|---|---|---|
| Anxiety score[a] | 0.237 (0.046 to 0.428) | 0.260 | 0.015 |
| Education[a,b] | -1.798 (-3.282 to -0.313) | -0.234 | 0.018 |
| Emotional support[c] | -0.167 (-0.318 to -0.016) | -0.288 | 0.031 |
| Depression score[a] | -0.263 (-0.510 to -0.016) | -0.242 | 0.037 |
| Length of depression episode[d] | 0.355 (-0.087 to 0.798) | 0.134 | 0.114 |
| Human capital[a] | -0.183 (-0.564 to 0.197) | -0.097 | 0.342 |
| Income[a,d] | -0.374 (-1.264 to 0.517) | -0.094 | 0.407 |
| RG-UK[a] | 0.048 (-0.073 to 0.170) | 0.080 | 0.433 |
| Attachment style[e] | -0.172 (-1.949 to 1.604) | -0.016 | 0.848 |
| Constant | 4.338 (-2.508 to 11.183) | | 0.212 |

$R^2$=0.292, $F_{(9,103)}$=5.01, p<0.0001, n=113

[a] Baseline

[b] Contrast group=non degree educated

[c] During follow-up

[d] Log transformed

[e] Contrast group=insecure attachment

### 6.3.2.2   Model assumptions

The model assumptions were met as the residuals followed a normal distribution (figure 6.2) and had a constant variance (figure 6.3). Additionally, inspection of the partial residual plots of the explanatory variables revealed that linearity assumptions could be upheld.

**Figure 6.2**      **Histogram of standardised residuals of regression model**
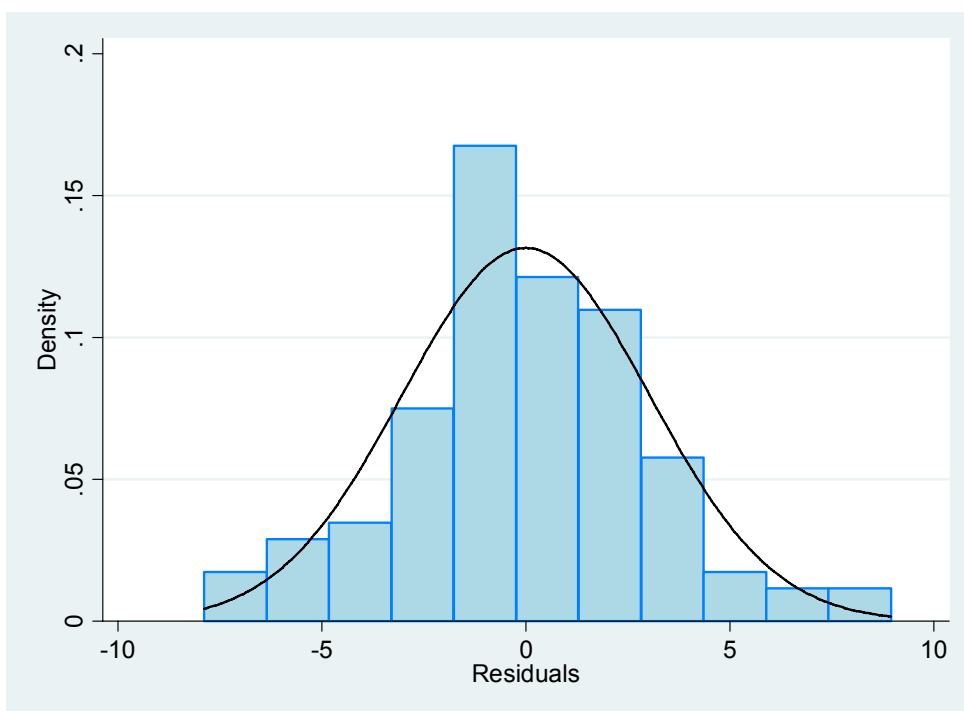


**Figure 6.3**      **Residual plot for change in HAD-D regression model**
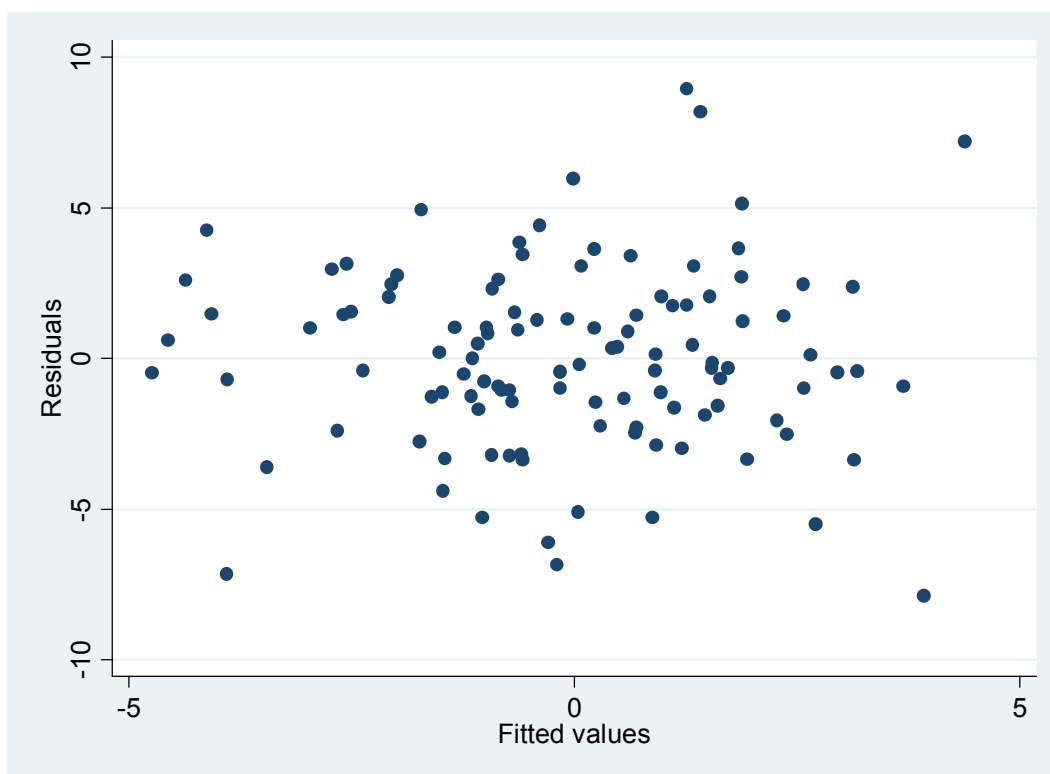
### 6.3.2.3 Alternative models

Analysis of the AIC statistics (Appendix E, table E1) indicates that two models potentially compete with the best model (table 6.32). The first is the same, but without the human capital variable. This is almost eight times less likely to be the best model given our data. The second model includes the RG-UK expert advice subscale in place of the RG-UK total scale, although this is more than ten times less likely to be the best model.

### 6.3.2.4 RG-UK expert advice scale

To explore the possible contribution of individual items of the RG-UK expert advice scale to improvement in depression symptoms during the study period (putting the confounding variables to one side for a moment), we dichotomized the sample into those whose HAD-D scores decreased (n=120, 'improvers') and those who showed no improvement (n=38, 'non-improvers').

Table 6.33 shows that there was only one item to which the 'improvers' were significantly more likely to have access than the 'non-improvers', item B10 'give you a good reference for a job' ($\chi^2$(1)=4.00, p=0.046). However, there was a non-significant trend towards the improvers having access to sound advice on problems at work (B2) and career advice (B7). It is possible that these employment-related resources were able to assist participants back to work or ameliorate problematic situations at work, which assisted to alleviate depression symptoms. Table 6.33 also shows that these three items had the strongest correlation with emotional support received during follow-up for the 'improvers' in this sub-scale. Each item arguably has an affective component. For example, the provision of a good reference for a job offers a validation to the self. Further, having someone to provide sound advice on problems at work and career advice also implies a degree of self-disclosure and trust. It is possible, then, that these items had an effect on the course of depression through emotional support that was provided through or alongside them.

**Table 6.33**     **Access to RG-UK expert advice scale items by HAD-D improvement**

| RG-UK expert advice scale item | Improvers (n=120) % 'yes' | Non-improvers (n=38) % 'yes' | Correlation with CPQ emotional support[1] |
|---|---|---|---|
| A6 - Has a professional occupation | 73.7 | 81.6 | 0.21* |
| A10 - Knows a lot about government regulations | 25.8 | 26.3 | 0.16 |
| A11 - Has good contacts with the local newspaper, radio or t.v. | 13.3 | 10.5 | 0.08 |
| B1 - Give you sound advice about money problems | 57.5 | 57.9 | 0.23* |
| B2 - Give you sound advice on problems at work | 51.3 | 37.8 | 0.32*** |
| B7 - Give you career advice | 40.3 | 27.0 | 0.26** |
| B8 - Discuss politics with you | 51.7 | 44.7 | 0.24** |
| B9 - Give you sound legal advice | 30.0 | 34.2 | 0.13 |
| B10 - Give you a good reference for a job | 71.7* | 54.1* | 0.31*** |

[1] For improvers only

*p<0.05, **p<0.01, ***p<0.001

### 6.3.2.5  Income

Participants with a higher income might have been able to purchase resources in preference to asking their friends, family or other network members. Therefore, it is possible that access to social capital may have alleviated depression symptoms more for those on lower incomes. To explore this possibility, we conducted further analysis on those whose household income was below the sample median of £1100 (n=68). However, we found no significant correlations between change in HAD-D scores and any of the RG-UK sub-scales in this sub-sample. Further research in low income populations is required to explore this further.

### 6.3.2.6  Interactions

Our measure of emotional support from the Close Person's Questionnaire (Stansfeld and Marmot, 1992) was derived from the perceived support from the person who the participants feels closest to. As over 39% and 44% of resources in the RG-UK expert advice scale were accessible through immediate family or friends respectively, it is possible that there was some interaction between the CPQ emotional support scale and the RG-UK expert advice scale. However, when we entered a term for this interaction into the regression model it was not significant and the model was not affected.

Further, it was possible that people with insecure attachments were less likely to access resources from their social network than those with secure attachments. We included an interaction term for these two variables in the analysis of covariance, but it was consistently not significant. This possibly implies that attachment style only impacted on depression by facilitating the creation of emotionally supportive relationships and not the mobilization of social capital.

## 6.4   Secondary Hypothesis

Our secondary hypothesis stated that participants with access to more social capital, as measured by the Resource Generator-UK, will have significantly higher overall quality of life, as measured by the Manchester Short Assessment of Quality of Life (Priebe et al., 1999) after six months, after controlling for potential confounding variables.

### 6.4.1   Univariate analysis

#### 6.4.1.1   Overall quality of life

The outcome variable to test our secondary hypothesis was measured by the MANSA question "How do you feel about your life as a whole?" at follow-up. As shown in table 6.23, mean scores at follow-up (3.49) were significantly higher than at baseline (3.22).

Responses to this question at follow-up peaked around the mid-point response option 'mixed' (no.4, figure 6.4). However, the distribution is approximately normal as the median and mode (both 4) are close to the mean (3.49).

#### 6.4.1.2   Access to social capital

There were significant positive correlations between all the RG-UK scales and overall quality of life at follow-up (table 6.34). The correlations of the RG-UK at baseline and overall quality of life at follow-up indicated that access to more social capital at baseline predicted higher overall quality of life at follow-up, without considering any confounding variables. A positive correlation also existed between the PG-UK scale at baseline and overall quality of life at follow-up (table 6.34), indicating some potential predictive qualities of the former. Again, as the correlations with the RG-UK were stronger and

more consistent throughout its internal domains, we entered its individual scales into the multivariate model.

**Figure 6.4    Histogram of overall quality of life at follow-up**
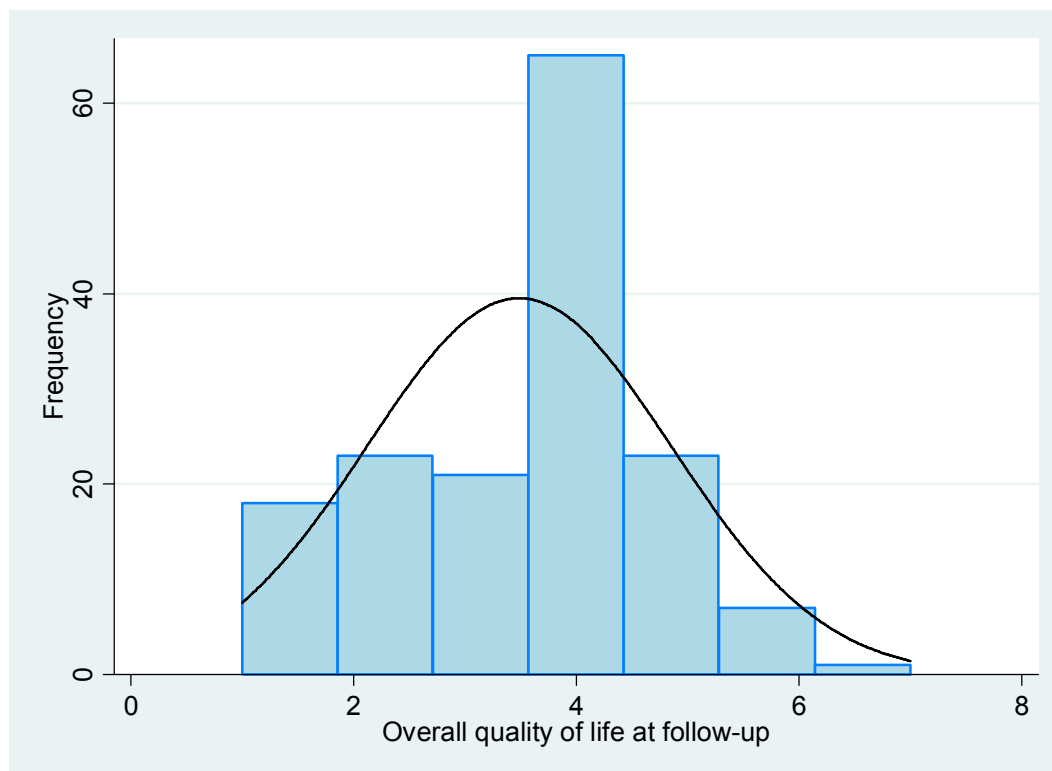


**Table 6.34    Overall quality of life at follow-up by access to social capital**

| Variable | n | Correlation |
| --- | --- | --- |
| **RG-UK (baseline)** | | |
| RG-UK scale | 150 | r=0.27, p<0.001 |
| Domestic | 156 | r=0.21, p=0.009 |
| Expert advice | 153 | r=0.25, p=0.002 |
| Personal skills | 156 | r=0.17, p=0.034 |
| Problem solving | 155 | r=0.22, p=0.007 |
| **PG-UK (baseline)** | | |
| PG-UK scale | 156 | r=0.21, p=0.009 |
| Professional occupations | 157 | ns |
| Skilled occupations | 156 | r=0.21, p=0.008 |
| Low skilled occupations | 157 | ns |
| Food chain occupations | 157 | r=0.14, p=0.086 |

### 6.4.1.3 Human capital

There was also a positive correlation between human capital, as measured by personal possession of the first 13 RG-UK resources, and overall quality of life at baseline (r=0.23, p=0.004). This was therefore included in the multivariate regression model to allow us to control for personal possession of resources.

### 6.4.1.4 Socio-demographic variables

Marital status was the only socio-demographic variable we measured that was associated with overall quality of life (table 6.35). Married or cohabiting participants were the most satisfied with their overall quality of life. This corresponds with the findings of other recent studies of people with depression (e.g. Trivedi et al., 2006).

**Table 6.35    Overall quality of life at follow-up by socio-demographic status**

| Variable | n | Overall QoL mean (s.d.) | Correlation / t-test / F-Test |
|---|---|---|---|
| **Sex** | | | ns |
| Male | 44 | 3.39 (1.28) | |
| Female | 114 | 3.53 (1.40) | |
| **Age** | 157 | | ns |
| **Ethnicity** | | | ns |
| White British | 132 | 3.55 (1.34) | |
| White other | 12 | 3.50 (1.57) | |
| Black | 2 | 4.00 (1.41) | |
| Asian | 6 | 2.33 (1.75) | |
| Mixed | 6 | 3.00 (0.89) | |
| **Marital status** | | | F=4.23, p=0.007 |
| Single | 42 | 3.21 (1.24) | |
| Married / cohabiting | 85 | 3.82 (1.24) | |
| Divorced | 27 | 2.96 (1.70) | |
| Widowed | 4 | 2.75 (1.26) | |
| **Marital status (binary)** | | | t=3.45, p<0.001 |
| Married or cohabiting | 85 | 3.82 (1.24) | |
| Not married or cohabiting | 73 | 3.10 (1.42) | |

### 6.4.1.5 Socio-economic variables

As in other quality of life studies (e.g. Evans et al., 2007), a large number of socio-economic variables were associated with overall quality of life in our sample. Participants who owned their own home, had a degree, a higher household income and were in employment all had better subjective quality of life at follow-up (table 6.36).

**Table 6.36    Overall quality of life at follow-up by socio-economic status**

| Variable | n | Overall QoL mean (s.d.) | Correlation / t-test / F-Test |
|---|---|---|---|
| **Primary Care Trust** | | | ns |
| Kingston | 29 | 3.62 (1.32) | |
| Richmond & Twickenham | 69 | 3.49 (1.46) | |
| Sutton & Merton | 60 | 3.42 (1.29) | |
| **Living situation** | | | F=2.28, p=0.063 |
| Owner occupier | 97 | 3.73 (1.30) | |
| Rented | 47 | 3.04 (1.49) | |
| Living with family / carer | 7 | 3.14 (0.90) | |
| Sheltered housing | 1 | 4.00 | |
| Temporary accommodation | 5 | 3.20 (1.30) | |
| Not known | 1 | 4.00 | |
| **Living situation (binary)** | | | t=2.95, p=0.004 |
| Owner occupier | 97 | 3.73 (1.30) | |
| Not owner occupier | 60 | 3.08 (1.39) | |
| **Employment status** | | | F=5.41, p<0.001 |
| Employed / self-employed | 72 | 4.03 (1.21) | |
| Student | 2 | 2.50 (0.71) | |
| Unemployed | 16 | 2.56 (0.96) | |
| Retired | 19 | 3.21 (1.23) | |
| Looking after the home | 10 | 3.70 (1.25) | |
| Carer | 1 | 5.00 | |
| Unable to work due to disability or ill-health | 38 | 2.95 (1.49) | |
| **Employment status (binary)** | | | t=4.86, p<0.001 |
| Employed / self-employed | 72 | 4.03 (1.21) | |
| Not employed | 86 | 3.03 (1.33) | |
| **Social class grouping** | | | F=2.53, p=0.085 |
| SOC 1-3 | 43 | 4.05 (1.50) | |
| SOC 4-6 | 44 | 3.64 (1.10) | |
| SOC 7-9 | 19 | 3.26 (1.37) | |
| Not known | 52 | 2.98 (1.29) | |
| **Education** | | | F=3.18, p=0.016 |
| No formal qualifications | 38 | 3.13 (1.40) | |
| CSE/GCSE or equivalent | 46 | 3.57 (1.15) | |
| A level or equivalent | 25 | 2.92 (1.35) | |
| Degree | 32 | 3.84 (1.57) | |
| Postgraduate degree | 12 | 4.17 (1.03) | |
| Not known | 5 | 4.40 (0.89) | |
| **Education (binary)** | | | t=2.78, p=0.006 |
| Without degree | 109 | 3.27 (1.30) | |
| With degree | 44 | 3.93 (1.44) | |
| **Household income per month in £** | 130 | | r=0.38[a], p<0.001 |

[a] Spearman's rank correlation coefficient

### 6.4.1.6  Depression variables

Satisfaction with life has been regarded to be a dimension of mental health because of its inverse correlation with depression (Headey et al., 1993). Attempts have even been made to integrate depression and quality of life into one conceptual framework (e.g. de Leval, 1995; Moore et al., 2005a). However, we contend that the concepts should remain distinct, as quality of life is a universal concept relating to life domains other than health, such as crime (Michalos and Zumbo, 2000), neighbourhoods (Sirgy and Cornwell, 2002), leisure and age (Silverstein and Parker, 2002).

Nevertheless, baseline depression and anxiety scores were negatively correlated with overall quality of life scores at follow-up (table 6.37). As depression is an important predictor of subjective quality of life (Bonicatto et al., 2001; Koivumaa-Honkanen et al., 2001) baseline anxiety and depression scores need to be included in the multivariate analysis. We also found that subjective quality of life improved alongside improvement in anxiety and depression symptoms, as has been found elsewhere (Koivumaa-Honkanen et al., 2001). However, having either a family history or previous episodes of depression, or the duration of the current episode of depression, were not associated with overall quality of life at follow-up (table 6.37).

Table 6.37       Overall quality of life at follow-up by mental health

| Variable | n | Overall QoL mean (s.d.) | Correlation / t-test / F-Test |
|---|---|---|---|
| **Baseline HAD scores** | | | |
| Anxiety | 158 | | r=-0.32, p<0.001 |
| Depression | 158 | | r=-0.52, p<0.001 |
| **Change in HAD scores** | | | |
| Change in anxiety scores | 158 | | r=-0.33, p<0.001 |
| Change in depression scores | 158 | | r=-0.33, p<0.001 |
| **Family history of depression** | | | ns |
| Yes | 77 | 3.51 (1.33) | |
| No | 76 | 3.53 (1.37) | |
| **Previous episodes of depression** | | | ns |
| None | 45 | 3.53 (1.39) | |
| 1 | 18 | 3.67 (1.33) | |
| >1 | 95 | 3.43 (1.37) | |
| **Length of current episode (years)** | 150 | | ns |

Participants who were not receiving any treatments at baseline had better overall quality of life at follow-up (table 6.38). This was not because this group had less severe symptoms (their mean baseline HAD-D scores were not significantly different from those receiving treatment), but it may indicate improved life satisfaction not reflected in their depression scores. This difference was not apparent at follow-up. Receipt of secondary care at baseline or follow-up was also not associated with our outcome.

**Table 6.38    Overall quality of life at follow-up by treatment**

| Variable | n | Overall QoL mean (s.d.) | t-test / F-Test |
|---|---|---|---|
| **Treatments receiving at baseline** | | | F=2.55, p=0.042 |
| None | 25 | 4.00 (1.15) | |
| Anti-depressants | 90 | 3.56 (1.39) | |
| Therapy only | 4 | 2.75 (0.96) | |
| Anti-depressants plus therapy | 26 | 3.27 (1.40) | |
| Other or undefined | 10 | 2.60 (1.17) | |
| Not known | 3 | 3.00 (1.73) | |
| **Treatments receiving at follow-up** | | | ns |
| None | 48 | 3.69 (1.32) | |
| Anti-depressants | 89 | 3.36 (1.27) | |
| Therapy only | 2 | 4.50 (2.12) | |
| Anti-depressants plus therapy | 16 | 3.50 (1.93) | |
| Other or undefined | 2 | 3.00 (1.41) | |
| Not known | 1 | 4.00 | |

### 6.4.1.7   Life events

There was no correlation between the number of life events in the six months prior to baseline and overall quality of life at follow-up. However there was a negative correlation between the number of life events in the six month study period and this outcome (spearman's r=-0.20, p=0.010).

Living with more children under the age of 16 was associated with better subjective overall quality of life (table 6.39).

**Table 6.39        Overall quality of life at follow-up by number of children**

| Number of children under 16 | n | Overall QoL mean (s.d.) | F-test |
|---|---|---|---|
| 0 | 114 | 3.37 (1.40) | F=4.23, p=0.007 |
| 1 | 17 | 3.06 (1.30) | |
| 2 | 19 | 4.11 (0.99) | |
| >2 | 8 | 4.63 (0.74) | |

### 6.4.1.8   Social networks

The number of people that participants felt close to at baseline was positively correlated with overall quality of life at follow-up (Spearman's r=0.28, p<0.001). Also, the number of friends that participants saw at least once a month was also positively correlated with this outcome (Spearman's r=0.31, p<0.001).

### 6.4.1.9   Social support

Both baseline (r=0.30, p<0.001) and follow-up (r=0.37, p<0.001) CPQ ratings of emotional support from the participant's closest person were associated with overall quality of life at follow-up. There were no correlations with the other social support scales. Also, the gender of the closest person or how far away they lived was not associated with our outcome.

### 6.4.1.10  Attachment styles

Attachment style was significantly associated with overall quality of life (table 6.40). In particular, participants with secure attachments were more satisfied with their quality of life than those with insecure attachments.

### 6.4.1.11  Correlation matrix

A large number of variables were associated with overall quality of life at follow-up and these are summarised in table 6.41 with codes to identify them in the correlation matrix (table 6.42). The correlation matrix facilitated the parsimonious selection of variables for inclusion in the multivariate regression model.

**Table 6.40** **Overall quality of life at follow-up by attachment styles**

| Variable | n | Overall QoL mean (s.d.) | t-test / F-Test |
|---|---|---|---|
| **Four categories (baseline)** | | | F=5.05, p=0.002 |
| Secure | 25 | 4.40 (1.19) | |
| Dismissing | 30 | 3.10 (1.49) | |
| Pre-occupied | 32 | 3.41 (1.43) | |
| Fearful | 67 | 3.36 (1.24) | |
| Not known | 4 | 3.50 (1.00) | |
| **Two categories (baseline)** | | | t(152)=3.77, p<0.001 |
| Secure | 25 | 4.40 (1.19) | |
| Insecure | 129 | 3.31 (1.35) | |
| **Four categories (follow-up)** | | | F=8.19, p<0.001 |
| Secure | 33 | 4.36 (1.14) | |
| Dismissing | 43 | 3.53 (1.18) | |
| Pre-occupied | 20 | 2.85 (1.23) | |
| Fearful | 60 | 3.18 (1.38) | |
| Not known | 2 | 3.50 (3.54) | |
| **Two categories (follow-up)** | | | t(154)=4.46, p<0.001 |
| Secure | 33 | 4.36 (1.14) | |
| Insecure | 123 | 3.25 (1.30) | |

Firstly, as there were strong inter-correlations between the RG-UK subscales (table 6.42) we decided to include only the RG-UK total scale in the regression model. Although this meant we were unable to detect the contribution of individual subscales to the outcome, it reduced the potential for the inter-correlations to obfuscate the relationship between access to social capital and overall quality of life at follow-up.

Secondly, the demographic variables (marital status, living status, employment, education and income) were also positively correlated. The highest coefficients represented moderate correlations between income and marital, living and employment status.

Baseline depression scores had the strongest, albeit negative, association with overall quality of life at follow-up. Unlike baseline anxiety scores, they were also correlated with many of the other variables. Treatments received at baseline had only a weak correlation with the outcome and was thus excluded from the multivariate analysis.

The numbers of threatening life events and children at home under the age of 16 were both correlated with a few other variables, but they were both included in the regression models to explore their relationship with the outcome.

The three CPQ measures were inter-correlated with moderate coefficients. As they were measuring very similar constructs, we selected the CPQ emotional scale score for the regression modelling procedure as it provided a more robust measure of perceived emotional support. It also had the strongest correlation with overall quality of life at follow-up.

The correlations in the matrix were generally of low-moderate strength, suggesting that as with our primary hypothesis multi-collinearity does not appear to be a problem.

**Table 6.41      Variables associated with overall quality of life**

| Variable | Correlation matrix code |
| --- | --- |
| Resource Generator total scale [a] | RG |
| Domestic Resources (RG-UK) [a] | Dom |
| Expert advice (RG-UK) [a] | Exp |
| Personal skills (RG-UK) [a] | Per |
| Problem-solving (RG-UK) [a] | Pro |
| Human capital (RG-UK) [a] | Hum |
| Marital status [a,b] | Mar |
| Living situation [a,b] | Liv |
| Employment [a,b] | Emp |
| Education [a,b] | Edu |
| Income [a] | Inc |
| Depression score (HAD-D) [a] | Dep |
| Anxiety score (HAD-A) [a] | Anx |
| Treatments receiving [a] | Tre |
| Life events (LTE) [c] | Lif |
| Number of children aged under 16 [a] | Chi |
| Number of people close to (CPQ) [a] | Clo |
| Number of friends seen at least once a month (CPQ) [a] | Fri |
| Perceived emotional support (CPQ) [c] | Emo |
| Attachment style (Four-category model) [a,b] | Att |

[a] Baseline measure

[b] Binary variable

[c] During follow-up

**Table 6.42    Correlation matrix of variables associated with overall quality of life (QoL) at follow-up**

| | QoL | RG | Dom | Exp | Per | Pro | Hum | Mar | Liv | Emp | Edu | Inc | Dep | Anx | Tre | Lif | Chi | Clo | Fri | Emo | Att |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QoL | 1 | | | | | | | | | | | | | | | | | | | | |
| RG | **0.274** | 1 | | | | | | | | | | | | | | | | | | | |
| Dom | **0.210** | **0.819** | 1 | | | | | | | | | | | | | | | | | | |
| Exp | **0.254** | **0.889** | **0.583** | 1 | | | | | | | | | | | | | | | | | |
| Per | 0.170 | **0.827** | **0.583** | **0.652** | 1 | | | | | | | | | | | | | | | | |
| Pro | **0.217** | **0.781** | **0.554** | **0.655** | **0.530** | 1 | | | | | | | | | | | | | | | |
| Hum | **0.231** | **0.349** | ns | **0.418** | **0.341** | **0.345** | 1 | | | | | | | | | | | | | | |
| Mar | **0.266** | **0.304** | **0.326** | 0.191 | **0.261** | **0.302** | ns | 1 | | | | | | | | | | | | | |
| Liv | **0.231** | **0.278** | 0.183 | **0.273** | **0.234** | **0.286** | **0.236** | **0.431** | 1 | | | | | | | | | | | | |
| Emp | **0.363** | **0.368** | **0.198** | **0.427** | **0.297** | **0.209** | **0.340** | **0.341** | **0.378** | 1 | | | | | | | | | | | |
| Edu | **0.220** | **0.263** | ns | **0.344** | ns | **0.329** | **0.377** | 0.166 | **0.268** | **0.230** | 1 | | | | | | | | | | |
| Inc | **0.355** | **0.356** | **0.227** | **0.396** | 0.208 | **0.329** | **0.263** | **0.519** | **0.503** | **0.547** | **0.465** | 1 | | | | | | | | | |
| Dep | **-0.519** | **-0.256** | **-0.314** | -0.190 | -0.159 | ns | ns | **-0.254** | -0.197 | **-0.336** | **-0.250** | **-0.313** | 1 | | | | | | | | |
| Anx | **-0.320** | ns | ns | ns | ns | ns | ns | ns | ns | ns | -0.187 | **-0.220** | **0.410** | 1 | | | | | | | |
| Tre | -0.161 | ns | ns | ns | ns | ns | ns | ns | ns | ns | ns | ns | ns | 0.193 | 1 | | | | | | |
| Lif | **-0.229** | ns | ns | ns | ns | ns | ns | ns | ns | ns | ns | **-0.297** | ns | ns | ns | 1 | | | | | |
| Chi | **0.227** | ns | ns | ns | ns | ns | ns | 0.252 | ns | ns | 0.157 | 0.191 | ns | ns | ns | ns | 1 | | | | |
| Clo | **0.270** | **0.244** | **0.216** | **0.269** | ns | **0.252** | ns | ns | 0.156 | ns | 0.167 | ns | **-0.204** | ns | ns | ns | ns | 1 | | | |
| Fri | 0.205 | **0.302** | **0.255** | **0.276** | 0.202 | **0.259** | ns | ns | **0.237** | 0.186 | 0.196 | **0.252** | **-0.263** | **-0.257** | ns | ns | ns | **0.411** | 1 | | |
| Emo | **0.366** | **0.433** | **0.409** | **0.393** | **0.275** | **0.335** | ns | **0.238** | 0.161 | **0.261** | 0.173 | **0.241** | **-0.328** | ns | ns | ns | ns | **0.425** | **0.283** | 1 | |
| Att | **-0.293** | ns | -0.199 | -0.197 | ns | ns | -0.165 | **-0.221** | **-0.202** | ns | **-0.206** | ns | ns | **0.321** | ns | ns | ns | **-0.406** | **-0.254** | **-0.277** | 1 |

See table 6.40 for abbreviations used

**p<0.01**, p<0.05. Only coefficients p<0.05 tabulated for ease of interpretation.

### 6.4.2    Multivariate analysis

#### 6.4.2.1    Analysis of covariance

The regression model with the best fit according to AIC criteria (Akaike, 1974) (Appendix E, table E2) explained 65% of the variance in overall quality of life at follow-up (table 6.43).

**Table 6.43        Linear regression model for overall quality of life at follow-up**

| Variable | b (95%CI) | Standardised b | p-value |
|---|---|---|---|
| Depression score [a] | -0.173 (-0.243 to -0.104) | -0.417 | <0.001 |
| Change in depression scores [b] | -0.141 (-0.193 to -0.088) | -0.364 | <0.001 |
| Overall quality of life [a] | 0.282 (0.114 to 0.450) | 0.246 | 0.001 |
| >2 children under 16 [a,c] | 0.815 (0.214 to 1.415) | 0.122 | 0.008 |
| Human capital [a] | 0.130 (0.029 to 0.230) | 0.178 | 0.012 |
| Attachment style [a,d] | -0.861 (-1.542 to -0.180) | -0.213 | 0.014 |
| Housing [a,e] | 0.496 (0.092 to 0.899) | 0.169 | 0.017 |
| RG-UK*attachment interaction | 0.109 (0.016 to 0.202) | 0.451 | 0.023 |
| RG-UK [a,f] | -0.095 (-0.185 to -0.004) | -0.421 | 0.040 |
| Income [a,g] | 0.230 (-0.016 to 0.477) | 0.149 | 0.067 |
| 1 child under 16 [a,c] | -0.396 (-1.015 to 0.224) | -0.089 | 0.208 |
| 2 children under 16 [a,c] | 0.226 (-0.163 to 0.615) | 0.058 | 0.252 |
| Anxiety score [a] | 0.235 (-0.030 to 0.774) | 0.067 | 0.390 |
| Education [a,h] | -0.171 (-0.611 to 0.269) | -0.058 | 0.442 |
| Emotional support [b] | 0.006 (-0.028 to 0.040) | 0.025 | 0.732 |
| Constant | 2.598 (0.334 to 4.861) | | 0.025 |

$R^2$=0.647, $F_{(15,97)}$=23.47, p<0.0001, n=113

[a] Baseline

[b] During follow-up

[c] Contrast group=no children

[d] Main effect coefficient for insecure attachment style (RG-UK values = difference from mean)

[e] Contrast group=owner occupier

[f] Main effect coefficient for insecure attachment style model

[g] Log transformed

[h] Contrast group=non degree educated

#### 6.4.2.2    Model assumptions

The model assumptions were met as the residuals followed a normal distribution (figure 6.5) and had a constant variance (figure 6.6). Additionally, inspection of the partial

residual plots of the explanatory variables revealed that linearity assumptions could be upheld.

**Figure 6.5        Histogram of residuals for regression model of overall quality of life**
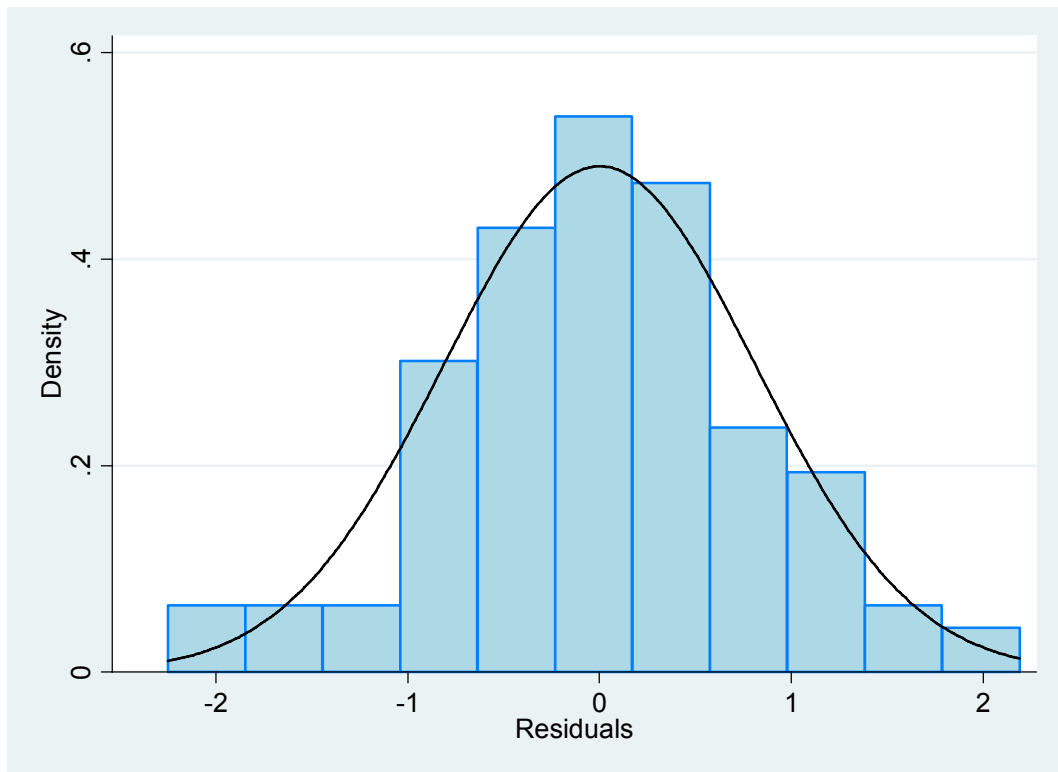


**Figure 6.6        Residual plot for overall quality of life regression model**
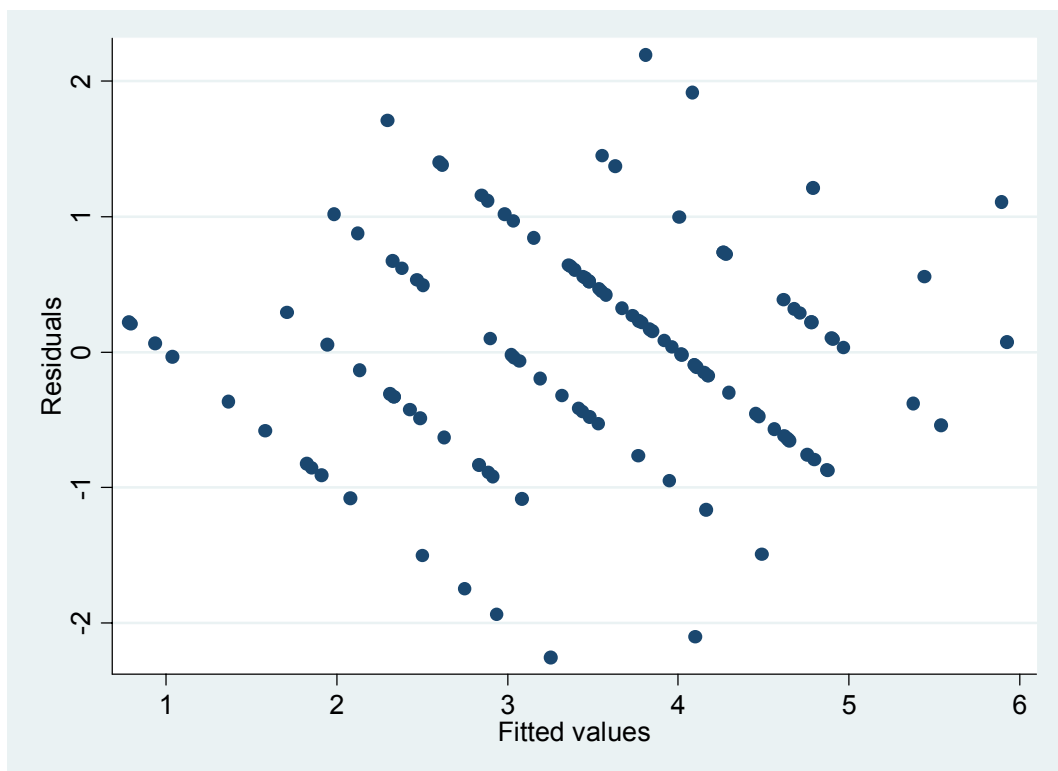
**6.4.2.3  Interactions**

Within the best-fit exploratory model (table 6.43), the interaction of attachment style and access to social capital (RG-UK) was significant. The inclusion of the interaction term meant that the regression model reported the main effect coefficient of RG-UK for the lowest value of attachment style (0=insecure). Therefore we re-ran the model with attachment style recoded (1=insecure/0=secure) to evaluate whether the interaction was of a qualitative or quantitative nature (Gail and Simon, 1985). In the recoded model the standardised b coefficient for the RG-UK was -0.421 in contrast to 0.061 in the primary model. This indicated that the effect of access to social capital on subjective quality of life at follow-up was qualitatively different between those with secure and insecure attachments. The coefficients presented in table 6.43 are those for the insecure attachment style. The main effect of the RG-UK in this model is an inverse relationship with quality of life at follow-up, for those with an insecure attachment. The relationship for those with secure attachments is very different with the coefficient positive, but the p-value was non-significant. Those with insecure attachments and access to more resources have overall lower perceived quality of life at follow-up.

**6.4.2.4  Predictors of overall quality of life at follow-up**

Baseline depression scores, change in depression scores during follow-up and baseline overall quality of life were predictors of overall quality of life at follow-up. The direction of these associations was as expected.

Having more than two children less than 16 years of age at baseline (in contrast to having none) was also associated with higher overall quality of life at follow-up. As there were only 10 participants (5.8%) in this group we performed a post-estimation Wald test on the variable to evaluate whether this was a spurious finding. However, this was significant ($F_{(3,100)}=4.36$, $p=0.006$), indicating these participants had a particularly high overall quality of life.

Two further variables in the model had significant associations with overall quality of life at follow-up. Firstly, personal possession of resources, or human capital, had a positive relationship with the outcome as expected. Secondly, housing status had an inverse association, where people who were owner-occupiers perceived their quality of life to be lower than participants with other forms of housing tenure. This contrasted with the univariate association which was in the opposite direction. We explored this further by

running regression models for the owner occupiers and then the other group. However, this variable was dropped from the regression model each time suggesting that the association may be spurious.

### 6.4.2.5 Alternative models

Analysis of the AIC statistics (Appendix E, table E2) indicate that at least three alternative models potentially compete with the best model (table 6.43). The first is the same, but without HAD-A. This is almost three times less likely to be the best model given our data. The second model excludes the interaction term for the RG-UK and attachment style. However, as the interaction term is significant when included this model is redundant. The third model is the same as the model in table 6.43 except that it includes the LTE in place of the HAD-A. However, this is almost seven times less likely to be the best model.

**Chapter 7**

**Discussion**

# 7 Discussion

## 7.1 Summary of thesis

This thesis has developed and tested a theoretical model which hypothesised that social capital, as defined within the neo-capital tradition, had a direct effect upon the course of depression. It did not find such an effect, though did detect an inverse relationship with subjective quality of life for those with an insecure attachment style. A summary of the thesis is presented in table 7.1.

**Table 7.1        Summary of thesis**

| | |
|---|---|
| **Theoretical model (ch.1)** | The neo-capital paradigm of social capital has a distinct and robust theoretical heritage. Social capital may have a direct effect upon the course of depression by facilitating positive life changes or as an additive effect upon an individual's resources. It is distinct from both social support and social networks, though not unrelated. |
| **Literature review (ch.2)** | The systematic review found that an individual's access to social capital had negligible effect on neither the onset nor course of depression. However, the included studies did not explicitly measure social capital and were beset with a number of methodological limitations |
| **Hypotheses (ch.3)** | (1) People with depression with access to more social capital will improve more over six months. (2) People with depression with access to more social capital will perceive a greater improvement in their subjective quality of life over six months. |
| **Instrument development (ch.4)** | Measures of resource-based (RG-UK) and prestige-based (PG-UK) social capital were developed for the UK general population. Field tests found them to be valid and reliable instruments. |
| **Prospective cohort study (chs. 5&6)** | A cohort of 173 people with depression was recruited from primary care and followed up over six months. A follow-up rate of 91% was achieved. We found that access to resource-based social capital had no direct effect on the course of depression (hypothesis 1). However, access to resource-based social capital had an inverse relationship with change in quality of life for those with an insecure attachment style (hypothesis 2). |

This chapter will discuss these findings, in the context of the strengths and limitations of the study. On the basis of our results, we will make some recommendations for clinical practice in primary care and future research.

## 7.2   Methodological limitations

There are some methodological limitations of the study to consider before discussing our results in more detail.

### 7.2.1   Setting

The study was set in four outer London boroughs with below average levels of social deprivation. The GP practices that we recruited participants through were located in diverse neighbourhoods, but the majority were in relatively affluent areas. The study participants largely reflected the socio-economic characteristics of their source population, though were relatively deprived in comparison. We cannot claim that our modest sample was wholly representative of this population, but it was sufficiently diverse to allow us to generalise the results of the study to other suburban areas. However, the study would need to be replicated in rural or deprived inner city locations to allow us to draw any conclusions about the effect of social capital on depression in these areas.

### 7.2.2   Sample

We obtained complete data from 158 participants in our study. Although the sample size exceeded the 126 we calculated was required to provide sufficient power (see section 5.5.3), this was a modest sample and was not of the magnitude of many large epidemiological studies.

The 158 people who provided data at both baseline and follow-up formed 14.3% of those who were invited to participate in the study (n=1104). While 12.8% (n=141) were not eligible for the study and others dropped out during it (n=35, 3.2%), the majority of those invited to participate either did not respond to the invitation (n=633, 57.3%) or declined to take part (n=137, 12.4%) (figure 5.2). A low participation rate is not untypical in this population and ours compares favourably to a UK trial of case management of depression in primary care which achieved complete data at the 12-week follow-up on only 3.4% (36/1073) of those who were invited to participate (McMahon et al., 2007). In the larger practices we randomly sampled potential participants but in the others we mailed information about the study to all those potentially eligible. The low participation rate suggests that the sample is self-selected to a considerable degree.

It is difficult to ascertain whether those who declined to take part were substantially different from those who did. Without full data on the non-participants we were unable to test fully for sampling bias. The GP practices we recruited from were wholly sites of clinical practice and not established to support research projects. Their clinical databases and capacity to support research were both limited, which made obtaining additional data very difficult.

Recruiting by post may have favoured more literate people. However, using this method gave those who attended their surgery less frequently an equal chance of participation (than if we recruited within surgeries) and we found no response bias by age or sex using postal recruitment (section 5.6.1). In fact the poorest response to the invitation to participate in the study came from the practice located in the wealthiest area (practice D, table 5.3). It is possible that potential participants from this practice were less reliant on their social capital than people living in more deprived areas and they considered it to be less important to take part in the study. However, the sample's mean access to social capital was as expected - less than the general population (table 6.15) but more than people with severe mental health problems such as schizophrenia (table 6.16). This suggests that sampling bias was minimal, but it cannot be entirely ruled out in the absence of data from non-participants.

### 7.2.3    Study design

This study was a linear prospective follow-up study with data collected at only two time points. The use of only two time points in this study limited our ability to capture the fluctuating course of depression which many individuals experience (Goldberg and Goodyer, 2005). Measuring depression scores during the six month period would have enabled us to construct longitudinal models to account for participants whose depression worsened before it improved. However, this was not possible within our limited resources.

Further, a six month follow-up period was perhaps too brief to identify the effect of social capital on the course of depression. For example, if an individual was to use people within her social network to obtain a new job, she would first need to have recovered sufficiently to be able to engage in new employment. Almost two-thirds of our sample still reached the HAD-D threshold for depression at follow-up (section 6.1.3.2) indicating that persistence of depressive symptoms possibly prevented people from accessing their social capital within the six month follow-up period. Additionally, if

a participant did find employment, or achieve any other fresh start as a result of accessing their social capital during this period, it is possible that the effect of this on their mental health may only become apparent during a longer follow-up period.

This study tested an extension of Brown & Harris' (1978) stress-vulnerability model for the course of depression, incorporating insights from social capital theory (section 1.8.1). The model posited that external phenomena affect the course of depression. However, individuals are not innocent bystanders in their own social environments and they have some control over the events that influence their lives or the relationships that they develop. Further, it is known that a substantial contribution of the determinants and symptoms of depression are genetic (Goldberg and Goodyer, 2005). Advances in neuroscience suggest that social environments and genetics do not operate in isolation and interactive models are more likely to extend our understanding of the course of depression than studying them in isolation (Uher, 2008). The lack of a genetic component to this study is therefore a significant limitation.

### 7.2.4    Research instruments

We used valid and reliable brief self-complete measures administered via postal questionnaires to collect our data. This was an efficient method but it compromised the quality of measurement and may have led to spurious correlations. For example, the HAD is a reliable and valid self-complete screening tool for depression and anxiety in primary care (section 5.5.1). However, it is a brief measure and less rigorous that the gold standard Structured Clinical Interview for DSM-IV disorders (First et al., 1996). Further, our measurement of life events – the List of Threatening Experiences (Brugha et al., 1985) – is a brief standardised checklist and cannot capture the contextual threat of life events which a semi-structured interview such as the Life Events and Difficulties Schedule (Brown and Harris, 1978) could. Our choice of research instruments does not necessarily invalidate our results. However, we acknowledge that greater measurement precision may have been achieved through the use of detailed interview schedules.

The RG-UK and PG-UK originate from a robust theoretical paradigm of neo-capital theory and have been well validated in this study (chapter 4). However, they quantify access to resource or prestige based social capital rather than help us to understand the meaning or utility of this to an individual. The 'usefulness' of social capital may vary according to socioeconomic status, gender, age, ethnicity or life position, for example.

An individual's specific context will determine what social capital may be of use to them at any given time. For example, it is possible that the quantity of social capital is less relevant than specific resources being accessible for an individual experiencing an episode of depression. Survey instruments such as the RG-UK or PG-UK are not able to evaluate complexities such as this and qualitative methods are required instead.

Pre-morbid personality has been considered to be an important predictor of the course of depression (Katschnig and Nutzinger, 1988). Personality factors may also be important in the creation and accessing of social capital (Lin, 2001), but these were not explicitly measured within the study. We excluded this because the complexities involved in measuring personality may have imposed too much burden on respondents and reduced response rates, compromising the study's validity. Also, Bartholomew & Horowitz's (1991) four category model of attachments was significantly related to personality structure, with fearful individuals showing more avoidant, self-defeating, and borderline tendencies and preoccupied individuals showing more dependent, self-defeating, and borderline tendencies than secure or dismissing individuals (Alexander et al., 1998). Hence adding in another questionnaire would not have benefited the study because of possible colinearity between it and the attachment style question.

### 7.2.5   Analysis strategy

The model tested in this study proposed that access to social capital had a direct effect on the course of depression (section 1.8.1). We tested this effect by including the social capital variables in the analysis of covariance alongside potential covariates such as life events and social support. However, the model also proposed that it had an indirect effect on depression outcomes by stimulating positive life events and providing social support. We were unable to evaluate its effect on positive life events as this was not measured in the follow-up questionnaire. However, we investigated 'fresh-start' experiences (Harris et al., 1999b), or positive life events, in the follow-up semi-structured interview (section 5.7.3). We decided that the analysis of the semi-structured interviews was beyond the scope of this thesis because of the magnitude and complexity of the data. It is possible that this future work will incorporate path analysis (Wright, 1934) to test additional relationships in our proposed model (figure 1.1).

### 7.2.6    Interview data

The omission of the interview data from this thesis is a limitation to be considered when evaluating the results. The interviews provided qualitative data about participants' experiences of accessing their social capital and may help to explain some of our findings. In particular, they may illuminate why access to social capital did not have a direct effect on the course of depression in our multivariate model (table 6.32). Inclusion of this data in the thesis was not feasible because of constraints on its word length.

## 7.3    Strengths of the study

The methodological limitations of this study need to be balanced with a consideration of its strengths.

### 7.3.1    Original contribution

This thesis makes an original contribution to the study of the effect of psychosocial phenomena on the course of depression. It extends the Brown-Harris psychosocial model of remission from depression (Harris et al., 2006a; Harris et al., 1999b; Harris and Craig, 2006) to include the potential role of social capital, as defined within the neo-capital tradition (section 1.8). This theoretical development hypothesised that social capital has a direct effect on the course of depression, independent of social support, through the mechanisms of social production function theory (Lindenberg, 1990; Ormel et al., 1997). Lin (2001) argued that expressive actions were important for mental health, but we proposed in this model that instrumental actions may also positively affect the course of an episode of depression.

Prior reviews of the literature on social capital and mental health have not systematically evaluated the use of the neo-capital concept within social support and social network studies. Our review (chapter 2), restricted to longitudinal studies to facilitate causal interpretations, found no consistent effect for social capital on depression but highlighted the methodological limitations of prior research.

The development and validation of the social capital instruments – the RG-UK and PG-UK – resulted in two valid and reliable tools for the assessment of access to resource-based and prestige-based social capital in the UK. The development of the RG-UK has

been published elsewhere (van der Gaag and Webber, 2007; Webber and Huxley, 2007) and the instrument has subsequently been used in two studies of people with mental health problems (Dutt, 2008; Murray et al., 2007), in addition to the current study.

This is the first study to investigate the effect of social capital on the course of depression using well-validated instruments. Two cross-sectional studies (Song, 2007; Song and Lin, in press) have found negative correlations between prestige-based social capital and depression, but this is the first study to apply these instruments to a prospective cohort.

## 7.3.2    Study design

This was a naturalistic cohort study of people with depression in primary care from diverse suburban communities of south-west London. The sample was heterogeneous and included people who were in their first episode of depression alongside those who had been unwell for many years. This enables us to generalise the findings to a wider group of people receiving treatment in primary care for depression than would be possible if we had just recruited people in their first episode, for example.

The prospective longitudinal design was a strength of the study as it helped us to avoid recall bias, which is a potential problem in the retrospective collection of psychosocial data (Katschnig and Nutzinger, 1988). Additionally, it effectively ruled out reverse causality as an interpretation of our results. Each instrument we used asked participants about a specific period of time which was distinct for the baseline and follow-up measures. For example, the instruments we used to measure social support, life events and access to social capital referred to specific time periods which was no longer than six months. The temporal sequence of the baseline and follow-up measures increased our confidence that the former were predictors and the latter were outcomes.

We achieved very low attrition rates (8.7%) in the cohort and little bias can be attributed to loss to follow-up.

In spite of their stated limitations (section 7.2.4), the research instruments we used were well validated. In particular, we have rigorously tested the validity and reliability of

the RG-UK (chapter 4), the main predictor in both our hypotheses, and we can be confident that this is a robust instrument.

## 7.4  Discussion of the results

### 7.4.1  Primary hypothesis

The findings of the analysis of covariance did not support our primary hypothesis that people with depression with access to more social capital will improve more over six months. Resource-based social capital was not associated with change in depression scores, although several variables were.

#### 7.4.1.1  Variables in the multivariate model

The best-fit multivariate model predicted 29% of the variance in change in depression scores. Therefore, there were potentially many more unmeasured variables that were associated with the course of depression. However, the variables that were included in the model were clinical, socioeconomic and emotional support.

Firstly, clinical features were prominent predictors of change in depression scores. On the one hand, participants with higher depression scores at baseline improved more than those with lower scores. This may be a result of regression to the mean with participants scoring high on the measure being more likely to score more moderately at follow up. The smaller change in depression scores for those with mild or moderate depression may also reflect its chronicity in primary care (Gilchrist and Gunn, 2007; Tylee and Haddad, 2007). On the other hand, higher levels of anxiety at baseline predicted worse outcomes for participants. This result is not unexpected as there is a high prevalence of 'anxious depression' in primary care (Fava et al., 2006) and anxiety has been found to predict poor outcomes in depression (Conradi et al., 2008). It is interesting to observe that treatments received during the study period were not associated with a change in depression scores, lending some support to Querido's (1959) early observations on the relative ineffectiveness of clinical predictors used in isolation from other prognostic indicators.

Secondly, participants educated to a degree level improved more in contrast to those without this level of education. In other studies education has been found to predict better outcomes for people receiving psychotherapy for depression (Marttunen et al.,

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2008) and for those with longer episodes of depression (McLeod et al., 1992), for example. It is also consistent with the poorer outcomes observed for those from lower socioeconomic groups (Lorant et al., 2003).

Educational attainment was the only socioeconomic or demographic variable to be associated with change in depression scores in the multivariate regression model (table 6.32). Education, central to the acquisition of human capital, enables people to enhance their socioeconomic position (Johnson, 1960). Education is likely to be a more objective indicator of socioeconomic position than income as the relationship of the latter with depression may be explained by reverse causality. Although reducing income inequalities may reduce inequalities in depression, the substantial contribution of employment status and education levels to the prevalence of depression (Costa-Font and Gil, In press) suggests that interventions should also be targeted towards these.

Finally, emotional support during the study period was associated with lower depression scores at follow-up, consistent with a number of other studies (George et al., 1989; Heponiemi et al., 2006; Hobfoll et al., 2003). The CPQ (Stansfeld and Marmot, 1992) measured perceptions of received support from close persons over the six month study period and the emotional support subscale was the only one associated with change in depression scores (section 6.3.1.9). There is a possibility that this finding could be explained by reverse causality as the rating of emotional support during the study period was taken at follow-up and there is evidence to suggest that the perception and levels of support go up as depression symptoms go down (Amann, 1991; Vaughn McCall et al., 2001). However, emotional support, in combination with education and the clinical variables, confounded the univariate relationship between the RG-UK expert advice subscale and change in depression scores (section 6.3.2.1).

### 7.4.1.2   Interpretations of the results

Our results can be interpreted in a number of ways. Firstly, our results suggest that the emotional content of close relationships was more influential on the course of depression than resources accessible through a variety of social ties. This supports the Brown-Harris psychosocial model of remission from depression (Harris et al., 2006a; Harris et al., 1999b; Harris and Craig, 2006) in which confidantes play a key role. However, it is possible that the effect of accessing social capital on the course of

depression may not have become apparent within our six month follow-up period. For example, the resource in the RG-UK expert advice subscale which was significantly more prevalent amongst those who improved over the study period – someone who could provide a good reference for a job (section 6.3.2.4) – is likely to have a long-term effect on depression if it actually did result in someone getting a new or better job. Therefore, as indicated above (section 7.2.3), a six-month follow-up period may have been too brief to identify this effect. This possibility can be explored further in the future analysis of the qualitative data from the semi-structured interviews conducted at follow-up.

Secondly, it is possible that social capital did have an effect on the course of depression, but this only became visible by means of emotional support. For example, if participants wanted to improve their socioeconomic position but lacked the human capital to achieve this, social capital theory suggests that those with access to more social resources are in a more advantageous position (Lin, 2001). When participants access their social capital from people close to them, the perception of emotional support they receive from that relationship may explain the change in their depression score rather than the concrete resources that they access. It is possible, that those lacking in social capital lacked these opportunities for emotional support. However, this argument is potentially circular and evidence supporting it cannot be gleaned from linear models.

Thirdly, it is possible that accessed social capital had no effect on the course of depression in the same way that received social support appears not to (section 1.4.5.2). For example, Lieberman and Mullan (1978) found that receiving help did not reduce distress; Pagel et al (1987) found that helpful aspects of social networks and social support bore no relation to depression; and received instrumental support in African American caregivers was associated with higher depression scores (Rozario et al., 2008). However, as social capital and social support are both theoretically and empirically distinct (see sections 1.4.5 and table 6.31 respectively) we need to be careful in making these comparisons.

Fourthly, it is possible that social capital had no effect on the course of depression because it did not have an additive effect on an individual's personal resources as suggested by our model (section 1.8.1). This could be because participants were unable to access their social capital because of the disabling effect of depression. The presence of education in the multivariate model, and the absence of a significant

relationship of the RG-UK with our outcome, suggested that socioeconomic position affected the course of depression independent of the effect of social capital.

Social capital models of accessing and exchanging resources may not function for people suffering from depression in the same way as healthy individuals. For example, non-reciprocal social exchanges have been found to be associated with an increased risk of depression (Siegrist, 2002; von dem Knesebeck and Siegrist, 2003) and one study found that failed reciprocity led to worse health (Chandola et al., 2007). Similarly, people with disabilities who could not reciprocate support they had received had more depressive symptoms than people without a disability (Dunbar et al., 1998). In a study of older people in Brazil (Ramos and Wilmoth, 2003), depressive symptoms were lower when an older adult who was receiving support was able to reciprocate.

Further, it can be argued that our sample had impaired social functioning which impacted on its ability to access social capital. As in other studies (e.g. Brugha et al., 1982; Johnson, 1991), our participants had smaller social networks and less social contact than healthy individuals. They also had access to less social capital than the general population (table 6.15). However, perceptions of social support, number of close contacts, frequency of contact with friends and relatives and access to social capital all remained stable during the study period in spite of improvement in depression scores.

Fifthly, the predictive power of social influences for the short term course of depression appears to depend upon whether it is an early or later episode of the disorder (Brugha et al., 1997). As we recruited a heterogeneous prevalent cohort of people at different stages of episodes of depression, we are unable to determine if this may explain why social capital did not affect the course of depression for our participants. Kendler and colleagues (1997) found that social support had the most significant effect on depression later in the episode. It is possible that social capital operates in a similar way; people with depression may need to be less symptomatic and functioning more effectively before they can access resources within their social networks and we were unable to capture the effect of this during a mere six month follow-up period.

Sixthly, it is likely that social capital is context specific and depends upon an individual's circumstances, life changes and life events. Therefore, it is possible that during our six month study period the participants had little need to access their social capital because they used their personal resources or did not experience events which

required the resources of others. Saltzman and Holahan (2002) found that the relationship between social support and subsequent depressive symptoms was entirely mediated by self-efficacy. People who cope by engaging with their problems rather than avoid them have fewer depressive symptoms. It is possible that those who improved in our sample were those who were able to cope independent of any assistance that may have been provided by their social resources.

Finally, to explain the loss of attachment style from the multivariate model for change in depression scores it is possible that emotional support acted as a mediator. Secure attachment styles may have facilitated the creation of emotionally supportive relationships. The interaction term for attachment style and RG-UK did not contribute to the final model suggesting that if attachment style had an effect on depression it was through the effect of emotional support and not access to social capital.

### 7.4.1.3 Alternative explanations

Three alternative explanations can be ruled out. Firstly, multi-colinearity did not appear to be a problem as the correlations between variables were only modest (table 6.31).

Secondly, the change in depression scores between baseline and follow-up was unlikely to be a result of response shift. We can be reasonably confident that we observed a real improvement in depression as the mean HAD-D improvement score of about 2.5 (section 6.3.1.1) exceeded the minimum important difference of 1.4 found in a longitudinal study of people with chronic obstructive pulmonary disease (Puhan et al., 2008). Although ours was a generic primary care population, we can assume that a change of this magnitude was clinically significant. Also, the change scores were normally distributed with no ceiling or floor effects (figure 6.1). The lack of change in social contact in the context of improvements in depression may indicate that social functioning remained impaired or did not improve at the same rate as symptoms of depression.

Thirdly, we can be confident that the RG-UK and HAD scales measured distinct constructs. The shared variance of the RG-UK and HAD-D at baseline was only 6.6% (table 6.31), lower than the shared variance of the RG-UK and locus of control in our pilot study (section 4.4.9). The RG-UK included concrete resources that could withstand the impact of perceptual distortions caused by depression.

**7.4.2    Secondary hypothesis**

The analysis of covariance with overall quality of life at follow-up as its outcome (table 6.43) provided partial support for our secondary hypothesis. Participants with insecure attachments and access to more social capital had overall lower perceived quality of life at follow-up. Although participants with a secure attachment style had higher quality of life at follow-up in the univariate analysis, when included in the multivariate analysis with an interaction term for the RG-UK the association became non-significant (section 6.4.2.3). This was possibly because the study only included 25/173 (14%) participants with a secure attachment at baseline. Before we discuss this finding in more detail, we will consider the other variables that were present in the model.

**7.4.2.1    Variables in the multivariate model**

The variables in the multivariate model explained 65% of the variance in overall quality of life at follow-up. The best-fit model included several variables (table 6.43), the important ones being depressive symptoms, having more than two children, human capital and the interaction of attachment style and access to social capital.

Depression scores at baseline, and their change during the study period, were both negatively associated with quality of life at follow-up after controlling for baseline quality of life scores. This association has been found in many other studies (e.g. Evans et al., 2007; Gostautas et al., 2006; Moore et al., 2005a; Reed et al., In press; Ruggeri et al., 2005). It provides evidence that symptom reduction can improve quality of life for people with depression.

Anhedonia due to depression may bias the measurement of subjective quality of life to the extent that the two concepts become indistinct. However, there is significant evidence to counter this argument. Firstly, the shared variance of depression and quality of life ratings in our study was only 27% (table 6.42). Further, as in our study, other studies have identified that many other variables are independently related to subjective quality of life, indicating that it is not redundant. For example, Corrigan and Buican (1995) found that depression, social adjustment, support network size and verbal intelligence were all independently related to subjective quality of life. Also, Kuehner (2002) and Kuehner and Buerger (2005) found no evidence for the biased appraisal of subjective quality of life by people with depression. Additionally, Lasalvia et

al. (2002) found that lower levels of depression symptoms were not equivalent to higher quality of life.

Our finding that participants with more than two children living at home had a higher quality of life at follow-up than those with none appears to be new and has not been reported in other studies of quality of life in depression. This possibly reflects social change since Brown & Harris' (1978) seminal study, in which having multiple school-aged children at home was a stressor. Easy availability and affordability of effective family planning techniques now mean that many parents plan to have more than two children. Therefore, in suburban London, large families may reflect enhanced socioeconomic circumstances. Alternatively, study participants with more than two children may have effective coping mechanisms or increased support which allows them to maintain their subjective quality of life during a depression episode.

The inclusion of our measure of human capital (personal resources possessed by participants from the RG-UK) in the best-fit model (table 6.43) may be associated with this. Participants with more personal resources rated their subjective quality of life at follow-up higher. This corresponds with the findings of other studies. For example, Zissi et al. (1998) found that increased autonomy was associated with higher subjective quality of life in people with severe mental health problems.

Finally, we found deterioration in subjective quality of life for people with insecure attachments and access to more social capital. Adult attachment styles are known to be associated with depression. For example, insecure attachment styles are associated with an increased risk of depression (Bifulco et al., 2002a; Stansfeld et al., 2008) and for women with depression fearful attachments are associated with severity of symptoms (Reis and Grenyer, 2004). The interaction of attachment style and access to social capital in our model (table 6.43) suggests that the ability to develop and maintain relationships, and access social capital through these relationships, may be important for subjective quality of life in depression.

### 7.4.2.2   Interpretations of the results

The finding that people with insecure attachments and access to more social capital have lower subjective quality of life suggests that these participants experienced barriers in accessing resources from other people. Participants with a dismissing attachment style deny the need for relationships and express confidence in their own

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independence. It is likely that these would not access their social capital as they would rely on their own personal resources instead. Participants with a preoccupied attachment style want to be completely emotionally involved with other people but are concerned about rejection. They may be anxious about asking other people for favours or accessing their prestige in case they were told 'no'. Finally, participants with fearful attachment styles, the most prevalent group in our sample, lack trust in relationships and are not comfortable with intimacy or dependency. These people may be aware of social capital that they could potentially access but are unable to obtain it due to mistrust or not wanting to rely on other people. A lack of trust may become a barrier if an individual with depression did not trust the other person to appreciate that they may not be able to reciprocate until a later point, for example.

This interpretation assumes that mobilization of social capital is important for enhancing quality of life. However, we have only measured access to social capital and our results only suggest that it has a negative effect for people with insecure attachments. Further research is required to test the hypothesis that those with secure attachments are more able to effectively mobilize their social capital to enhance their quality of life. However, there is good evidence from the social capital and attachment literatures to suggest that this may be the case.

It is possible that the 'invisible hand of social capital' (Lin and Ao, 2008) may play a role in enhancing quality of life for people with secure attachments. Lin and Ao (2008) developed their ideas about the 'invisible hand of social capital' in the context of job searching using informal contacts within individuals' networks, but the ideas are transferable to our context. They argued that having social networks rich in resources increases the amount of job-related information that is obtained in routine exchanges:

> "Access to richer and more diverse embedded resources enhances the likelihood of receiving useful information about jobs in the job market in routine exchanges, without asking or actively searching for it. It is a relative advantage beyond and in addition to other assets, including human capital" (Lin and Ao, 2008: 109).

The invisible hand of social capital operates when information is disseminated informally within networks and individuals may not account for this if asked whether or not they had used their informal contacts when seeking employment. Lin and Ao (2008) found that information gained informally about job opportunities facilitated attainment in the labour market.

People with depression may find it difficult to make new relationships or maintain existing ones. However, there is a possibility that they can still benefit from embedded resources through routine informal exchanges with network members. Information about new opportunities, offers of assistance or favours may all be provided in the course of these informal contacts without the individual needing to ask or actively seek it. The knowledge of potentially accessible social capital within these relationships may alone be sufficient to improve an individual's subjective quality of life. It is possible that this may be particularly relevant for people with secure attachments as they would be more confident about accessing it if it were required.

People with secure attachments are more interdependent in their relationships (Simpson, 1990), perceive more social support and less distress (Vogel and Wei, 2005) and perceive themselves more positively in close relationships (Kanemasa and Daibo, 2003). Also, attachment anxiety, subjective support and availability of support are all associated with subjective well-being (Li et al., 2006). This evidence suggests that individuals with insecure attachments are more likely to have less secure relationships through which to access social capital. The perception of a greater availability of resources may worsen these individuals' subjective quality of life due to potential difficulties in mobilizing their social capital if it were required.

It is difficult to evaluate from this study whether access to social capital, or its mobilization, is the important mechanism for subjective quality of life. It is possible that having accessible resources at the disposal of individuals may be sufficient to enhance their sense of well-being, without actually mobilizing them, for example. The access-mobilization axis of social capital parallels, to a certain extent, the perception-reception axis of social support. As previously discussed (section 1.4.5.2), the perception of social support has a stronger relationship with mental health than receipt of social support. Our model did not account for the potential effect of mobilized social capital on depression and subjective quality of life in people with depression and further research is required to investigate this.

The RG-UK captures inequalities in access to social capital. We have shown that people with depression in our sample have access to fewer resources than the general population, but more than people with severe mental health problems (tables 6.15 and 6.16). Our results suggest that there are structural inequalities in access to social capital according to mental health status, as has been found elsewhere (Song, 2007;

Song and Lin, in press). These inequalities are associated with subjective quality of life. However, the interaction with attachment style suggests that relationships are an important mediator in the association between inequalities in access to social capital and subjective quality of life. People with insecure attachment styles experience a worsening in their quality of life over time even if they have access to the same quantity of social resources within their networks as those with secure attachments. The interaction with attachment style suggests that it is not merely inequalities in access to social capital that affects subjective quality of life. It is likely that accessible social capital may be difficult to mobilize for those with insecure attachments.

Some evidence to support this can be found in two very different populations. Firstly, studies have shown that a lack of access to social capital disadvantages the black urban poor in their search for employment (e.g. Wacquant and Wilson, 1989). Alternatively, Smith (2005) proposed that the problem lay in their difficulties in mobilizing network resources rather than in merely a deprivation of resources. When testing her hypotheses, she found that the unemployed residents of high poverty neighbourhoods had access to less social capital than employed residents in the same neighbourhood. She also found that distrust and noncooperation were pervasive in these networks which made the mobilization of network resources problematic (Smith, 2008).

Secondly, Bartley et al. (2007) found that secure attachments were associated with greater occupational attainment in the civil service for those with fewer educational qualifications. Considering the important role of social capital in status attainment (e.g. Lin et al., 1981; Moerbeek and Flap, 2008), it is possible that the civil servants with secure attachments, although less well educated and with access to possibly less social capital than those higher in the social order, were able to mobilise their social capital more effectively. Further, the social support literature suggests that intrinsic characteristics of individuals are important attributes that affects the perception and mobilisation of support. For example, Moreira et al (2003) found that the effect of perceived social support on psychological distress was largely accounted for by attachment security and internal locus of control has been associated with more effective support mobilization (Eckenrode, 1983; Lefcourt et al., 1984).

Our sample was relatively deprived in terms of their access to social capital. The participants with insecure attachments may have found mobilization of social capital problematic because of the nature of their relationships with other network members,

which may have been characterised by mistrust and noncooperation, for example, leading to a worsening subjective quality of life.

Finally, our results can be favourably compared to recent findings in the field of happiness research. For example, Ballas and Dorling's (2007) analysis of the British Household Panel Survey found that positive life events such as starting a new relationship and employment-related gains had positive effects on happiness. This reflects the Brown-Harris psychosocial model of remission from depression (section 1.8) and, although there is no evidence to support or refute this, it is not inconceivable that these events were influenced by mobilized social capital, which suggests a possible pathway for its influence on subjective well-being or quality of life.

### 7.4.2.3   Alternative explanations

As with our primary hypothesis, we can rule out some possible alternative explanations for these results. Firstly, multi-collinearity again did not appear to be a problem as the correlations between variables were only modest (table 6.42).

Secondly, the change in quality of life scores between baseline and follow-up was unlikely to be entirely as a result of response shift. A meta-analysis of response shift in quality of life studies found their effect sizes to be small in studies of psychological well-being (Schwartz et al., 2006). The change in mean overall quality of life scores during our study period was significant and substantially more than in similar populations (e.g. Evans et al., 2007). Although we did not formally test for response shift, if this did occur it was likely to have had a minimal effect on the change in quality of life scores.

## 7.5   Resource-based and prestige-based social capital

Two studies have found cross-sectional associations between prestige-based social capital and depression (Song, 2007; Song and Lin, in press). This is the first study to evaluate the effect of resource-based social capital on depression.

At baseline we found no cross-sectional association between our measure of prestige-based social capital, the PG-UK, and HAD-D scores, although the PG-UK had a marginally significant negative correlation with change in HAD-D scores during the study period. In contrast our measure of resource-based social capital, the RG-UK, was negatively correlated with the HAD-D at baseline and one of its scales was also

negatively correlated with change in HAD-D scores. Although neither scale was strongly correlated with the HAD-D, the correlations with the RG-UK were more substantial. The PG-UK was not entered into the regression models alongside the RG-UK to avoid colinearity.

The finding that resource-based social capital was more strongly related to depression than prestige-based social capital is not unexpected in a population of people with depression. Position generators such as the PG-UK are unable to account for access to network members whose social status is not associated with prestige, such as homemakers, students, unemployed or retired people (van der Gaag et al., 2008). People with depression who are outside the labour market, either temporarily or permanently, are possibly more likely to find resources provided by these groups important for their subjective quality of life. For example, resources such as having someone to do small jobs around the home, shopping for you or lend you money, which are all highly prevalent in the general population (table 4.15), are likely to be more valuable for people whose mental health is poor. Prestige-based social capital may be more useful for people seeking to enhance their social status, who are likely to be approaching recovery.

A higher proportion of the items in the RG-UK were accessible through the immediate family than in the PG-UK, whereas the reverse was true for acquaintances (tables 6.19 and 6.22). Resource-based social capital therefore appears more accessible through stronger ties and prestige-based social capital appears more accessible through weak ties, as van der Gaag et al. (2008) also found.

We found a significant increase in the mean number of RG-UK items accessible through acquaintances during the study period (table 6.19). This possibly reflects an increase in the sociability of the cohort and the development of more informal contacts as depressive symptoms were alleviated in the six months, although no change in the number of close contacts was observed. However, a full analysis of predictors of change in access to social capital is not possible here and will be the subject of future work.

## 7.6   Clinical implications

### 7.6.1   ABC-E model of emotion

In 2008 the UK government published a plan to improve access to psychological therapies (Department of Health, 2008) to support the implementation of clinical guidelines for the treatment of depression (National Collaborating Centre for Mental Health, 2004). Although the plan called for a holistic approach to the treatment of depression, its main focus was to provide more therapists trained in cognitive behavioural therapy in primary care settings. Initial evaluations of two pilot sites appear promising (Clark et al., 2008). However, there are few indications that the Improving Access to Psychological Therapies (IAPT) programme has a well-developed holistic social perspective.

Developed by the University of Manchester, but influenced by the findings of this study, the ABC-E model of emotion was designed to articulate a bio-psychosocial model for primary care (Briddon et al., 2008). Based on the stepped model of care it recognised the important role that social interventions may play in the treatment of depression in primary care. In particular, it acknowledged that an individual's social context is important to their recovery from depression.

The results of this study suggest that the social interventions within the ABC-E model should consider three phenomena. Firstly, the provision of emotional support needs to be paramount as it is important for the alleviation of depression. Secondly, while we found that access to social capital did not play an independent role in alleviating symptoms of depression in our sample over the study period, it was associated with worsening subjective quality of life in those with insecure attachments. Therefore, it is worthwhile considering interventions which have social capital creation as a goal as this may have a positive effect for those with secure attachments or those who could mobilise it when required. Thirdly, interventions need to focus on attachment style as a precursor to the mobilization of social capital.

#### 7.6.1.1   Emotional support

Our findings highlight the importance of emotional support to the alleviation of depression. Therefore, interventions need to focus on the development of resourceful networks that can provide emotional support. This may include enhancing support

already available within networks, such as from family members, close friends or carers. Alternatively, it may include the provision of additional support from befrienders, for example, who are known to be associated with remission from depression (Harris et al., 1999a, b). The provision of emotional support is not a new clinical recommendation for the treatment of depression, but it is important to re-state it for future generations of clinicians such as the new graduate primary care mental health workers.

### 7.6.1.2    Social capital interventions

The RG-UK has the potential to form the basis of a social capital intervention strategy. When undertaking the cognitive appraisal of the RG-UK (section 4.4.3) we were struck by the encouraging responses of the participants. Many said that it had prompted them to think about aspects of their life that they had not previously considered. Some were surprised by the number of different resourceful people they knew who could be drawn upon if needed. Others noticed gaps in their social networks or resources which they have to purchase as they are not accessible from network members. This illustrates the potential of the RG-UK to be used as a tool for people to quickly assess the state of their social networks and identify areas for future development.

The Dutch resource generator has been developed into a 'network MOT' for companies to enhance their networking and relationship management. Martin van der Gaag describes this as:

> "a network questionnaire that qualitatively walks customers through the quality of their current network and its management via a systematic extract from the [social capital] instruments" (van der Gaag, 2008).

The RG-UK could be developed into a clinical tool to help people with depression to identify weaknesses in the resource provision of their social network. In the context of a long-term treatment strategy, skilled primary care clinicians could work alongside people in providing support and guidance on developing their networks with new resourceful relationships. The timing of the intervention in the process of recovery would be crucial, but this may have the potential to enable people to become more inter-dependent and possibly prevent relapses of their illness in the future. The intervention would also feature work on developing trust within relationships and the process of mobilization of social capital.

There are other interventions that may improve access to social capital. For example, the evaluation of the Capital Volunteering project, which provides support for people with severe and enduring mental health problems to engage in volunteering, found an increase in access to social capital for participants over time (Murray et al., 2007). Although we cannot be certain that the change occurred as a result of the intervention because of the lack of randomisation or a control group, this result indicates that the RG-UK is sensitive to change and that it could be used an outcome measure for social capital interventions. The Capital Volunteering evaluation found that volunteering had no effect on the mental health of the participants, but there is evidence from other studies that it can reduce depressive symptoms in older adults (Musick and Wilson, 2003).

### 7.6.1.3 Attachment therapy

Attachment theory can be effectively employed in psychotherapy to achieve change for people with insecure attachments (e.g. Sable, 1992, 2004). Attachment behaviour is instinctive (Harris, 1997) and through the development of an attachment with a therapist, individuals can be assisted to understand their styles of responding to other people. The experience of a new kind of attachment during therapy enables individuals to develop secure relationships in their everyday lives (Sable, 2004). Also, insights from attachment theory can lead to a better understanding of the genesis of inter-personal problems and, through psychotherapy, individuals experiencing these problems can be helped to develop secure attachments (Mallinckrodt, 2000).

Attachment-based psychotherapy is not readily available in the IAPT programme because it is more expensive to provide than the few sessions of cognitive behavioural therapy that are usually available. It would also be unrealistic to train graduate primary care mental health workers, who are central to the delivery of the IAPT programme, as psychotherapists. However, due to the high prevalence of insecure attachments amongst people with depression (about 85% of our sample at baseline), it will be important to integrate this perspective into intervention models such as the ABC-E model of emotion (Briddon et al., 2008). This could take the form of routine screening for insecure attachments using a tool such as the one used in this study (Bartholomew and Horowitz, 1991). A training module on attachment styles could be delivered to graduate primary care mental health workers as part of their continuing professional development, if there was no space to include it in their core curriculum. This could be

supported by clinical supervision focusing on engagement in the therapeutic process and the formation of secure attachments.

### 7.6.2    Implications for General Practitioners

When diagnosing depression and referring to other clinicians within the stepped model of care GPs have a crucial role to play in highlighting social factors in the aetiology and course of an individual's depressive episode. Although GPs will not be able to deliver social interventions themselves, they will be able to identify people with recurrent depression who may benefit from them and make appropriate referrals. The IAPT programme provides an important opportunity to integrate social perspectives into intervention strategies and GPs can encourage this by focusing on patients' social, as well as psychological, needs.

We encountered a high degree of chronicity of common mental disorders in this study. Although there was a clinically significant improvement in the cohort over the six months, only 37% scored below the HAD-D threshold for probable depression at follow-up and only 18% fell below the same threshold for anxiety at follow-up. The chronicity of depression in primary care has been noted by others and calls have been made for a chronic disease management model to ensure optimal care for people with this diagnosis (Tylee and Walters, 2007). There is some evidence to suggest that case management in primary care is effective (Christensen et al., 2008). If GPs were to consider adopting such models, our study suggests that a focus on adult attachments and the development of resourceful relationships may need to be incorporated into any long-term case management strategies for the treatment of depression in primary care.

### 7.6.3    Implications for Mental Health Social Workers

Mental health social workers (MHSWs) who work for primary care mental health teams bring a social perspective to the treatment of common mental disorders (Firth et al., 2003; Firth et al., 2004). They are particularly skilled at understanding and working with complex psychosocial problems that are inextricably linked to the chronicity of depression in primary care (Firth et al., 2008). MHSWs are also employed in a variety of other roles in primary care such as gateway workers (Janit, 2008). The location of MHSWs in primary care is not common in the UK and is potentially under threat as the IAPT programme directs funding towards psychological therapies. However, this approach has been praised by the National Director for Mental Health:

"The team are working hard to address the social as well as the health problems of their service users, and have established good links with the voluntary sector. It seems to me that this is an example of the NHS at its best." (Louis Appleby, 1.11.07) (Firth, 2008).

MHSWs providing long-term casework and therapeutic interventions within primary care have the professional training and clinical experience to deliver psychosocial interventions as recommended by the findings of this study. They are familiar with both attachment theory and the importance of robust social networks for good mental health. Within a stepped model of care MHSWs could work with people with more complex psychosocial problems and supervise other primary care workers, such as graduate primary care mental health workers, to deliver interventions addressing insecure attachments and enhancing access to resourceful social relationship.

## 7.7 Future work

This study is the first to explore the role of social capital, within the neo-capital tradition, on the outcomes of depression in primary care. Bearing in mind the study's limitations, further research is required to confirm our results. In particular, a longitudinal study of people with secure attachments will help us to identify if the result of our secondary hypothesis could be replicated demonstrating a positive association between access to social capital and quality of life over time. Additionally, a longer follow-up period will help us to evaluate the effect of social capital on depression more robustly and the addition of a valid measure of mobilized resources will elucidate the mechanism that connects social capital to our outcomes of interest. The study needs to be replicated in other locations such as rural areas or deprived inner city locations to observe how the effect of social capital may vary according to geo-demographic context.

There is potential to explore the effect of social capital on outcomes in other common mental disorders such as anxiety or phobia disorders, and in more severe and enduring mental health problems such as schizophrenia and bi-polar affective disorders. Existing work shows inequality in access to social capital for those with more severe mental health problems (Dutt, 2008; Murray et al., 2007). These inequalities need to be explored further to evaluate whether improvements in access to social capital can improve mental health or quality of life. Observation studies based in both primary and

secondary care can help us to understand what a clinically important change in the RG-UK may look like to inform the development and evaluation of social interventions.

Further work is required to evaluate the ABC-E model of emotion (Briddon et al., 2008) to understand how graduate primary care mental health workers are implementing it in practice and its effect on people with depression. In particular, scoping work needs to be conducted to explore whether elements of attachment therapy (section 7.6.1.3) or social capital interventions (section 7.6.1.2) could be realistically incorporated into the model. The effectiveness of the ABC-E intervention model needs to be evaluated in a randomised controlled trial in comparison with psychological therapy alone and GP care.

Analysis of the interview data from this study will help us to understand barriers to the mobilization of social capital that our participants experienced. This may explain the findings of our primary hypothesis and will inform the future development of social capital interventions. Further analysis of social capital as the outcome variable in the Capital Volunteering evaluation (Murray et al., 2007), and additional analysis of the data generated by this study, will highlight predictors of change in access to social capital which may also inform future intervention strategies.

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# Appendix A: Developmental versions of the Resource Generator-UK

# Resource Generator-UK (α1)

**1.    (a)    Do you know anyone with the skill or resource listed below that you are able to gain access to within one week?**

For each skill or resource, please tick only **one** of the first 5 columns corresponding to the person who is closest to you.  This measure assumes that family members are closest, followed by friends and then acquaintances.  The following definitions of these apply:

| Immediate Family | Wider Family | Friends | Colleague or Acquaintance |
|---|---|---|---|
| Parents, children, siblings or other household members | Grandparents, grandchildren, aunts, uncles, cousins etc not in your immediate family | Someone outside your family whom you could visit uninvited | Someone that you would have a small conversation with on the street or at work and whose name you know |

**(b)    We would also like to know if you have these skills or resources.  If you do, please also tick the column headed 'You?'.**

| 1.  (a) Do you know anyone who … ?  (b) Are you someone who … ? | Immediate Family | Wider Family | Friend | Colleague or Acquaintance | No | You? |
|---|---|---|---|---|---|---|
| 1 …can repair a car, bike, etc. | | | | | | |
| 2 …owns a car | | | | | | |
| 3 …is handy repairing household equipment | | | | | | |
| 4 …can speak and write a foreign language | | | | | | |
| 5 …can work with a PC | | | | | | |
| 6 …can play an instrument | | | | | | |
| 7 …has knowledge of literature | | | | | | |
| 8 …has A levels | | | | | | |
| 9 …has a higher vocational training | | | | | | |
| 10 …reads a professional journal | | | | | | |
| 11 …is active in a political party | | | | | | |
| 12 …owns shares worth at least £3,000 | | | | | | |
| 13 …works at the town hall | | | | | | |
| 14 …earns more than £1,500 monthly | | | | | | |
| 15 …owns a holiday home abroad | | | | | | |
| 16 …can sometimes hire people | | | | | | |
| 17 …knows a lot about governmental regulations | | | | | | |
| 18 …has good contacts with a newspaper, radio or t.v. station | | | | | | |
| 19 …knows about soccer | | | | | | |
| 20 …has knowledge about financial matters (e.g. taxes, subsidies) | | | | | | |

**2.** **If you need someone to help you in the following areas, would you be able to obtain this help from anyone within one week?**

Please tick only **one** box corresponding to the person who is closest to you. This measure assumes that family members are closest, followed by friends and then acquaintances. The same definitions of these apply:

| Immediate Family | Wider Family | Friends | Colleague or Acquaintance |
|---|---|---|---|
| Parents, children, siblings or other household members | Grandparents, grandchildren, aunts, uncles, cousins etc not in your immediate family | Someone outside your family whom you could visit uninvited | Someone that you would have a small conversation with on the street or at work and whose name you know |

| 2.<br><br>**Do you know anyone who … ?** | Immediate Family | Wider Family | Friend | Colleague or Acquaintance | No |
|---|---|---|---|---|---|
| 1 … could find a holiday job for a family member | | | | | |
| 2 … could give advice on conflicts at work | | | | | |
| 3 … could help when moving house (packing, lifting) | | | | | |
| 4 … could help with small jobs around the house (carpentry, painting) | | | | | |
| 5 … could do your shopping when you (and your household members) are ill | | | | | |
| 6 … could give a medical second opinion | | | | | |
| 7 … could lend you a large sum of money (e.g. £3,000) | | | | | |
| 8 … could provide a place to stay for a week if you have to leave your home temporarily | | | | | |
| 9 … could give advice about conflicts with family members | | | | | |
| 10 … could discuss with you what political party to vote for | | | | | |
| 11 … could give advice on matters of law (e.g. problems with the landlord, boss, municipality) | | | | | |
| 12 … could give a good reference when applying for a job | | | | | |
| 13 … could baby-sit your children | | | | | |
| 14 … could discuss important matters with you | | | | | |
| 15 … you could visit socially | | | | | |

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## Resource Generator-UK (α2)

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The following questions are about the people you currently know.  These might be family members, friends or acquaintances, but they do not include friends of friends or people that you are not *personally* in contact with.

The questions will ask if you know someone with a particular skill or resource.  For each one, please circle 'yes' if you know someone. Then place a mark on the line next to the question indicating how close you are to the person who you would be most likely to ask for it.  If you are very close to that person (e.g. they are your partner or within your immediate family), place your mark closer to the left side:

Very close                                                          Not very close

Or, if you are not very close to that person (e.g. you know their name and would have a small conversation with them if you met them in the street), place your mark closer to the right side:

Very close                                                          Not very close

Or, if you are quite close to that person (e.g. a friend or colleague), place you mark closer to the centre:

Very close                                                          Not very close

If you do not know anyone with that particular skill or resource, please circle 'no'.

**(A)    Do you personally know anyone with the skill or resource listed below that you are able to gain access to within one week?**

**Do you know anyone who …?**                                          **How close are you to that person?**

Very close                                                            Not very close

1 …    can repair a car                          **Yes / No**

2 …    owns a car                                **Yes / No**

3 …    is a reliable plumber                      **Yes / No**

4 …    is fluent in another language              **Yes / No**

5 …    can repair computers                       **Yes / No**

6 …    can play a musical instrument              **Yes / No**

7 …    has a good knowledge of literature         **Yes / No**

8 …    has a higher degree (eg MA, PhD)           **Yes / No**

9 …    is good at gardening                       **Yes / No**

10 …  has a professional occupation              **Yes / No**

11 …  is a local councillor                      **Yes / No**

12 …  successfully trades shares                 **Yes / No**

13 …  works for the local council                **Yes / No**

14 …  owns a successful business                 **Yes / No**

15 …  owns a holiday home abroad                 **Yes / No**

16 …  can sometimes employ people                **Yes / No**

**Do you know anyone who …?**                    **How close are you to that person?**

Very close                                          Not very close

17 …  knows a lot about government regulations   **Yes / No**

18 …  has good contacts with the media           **Yes / No**

19 …  has time to help other people              **Yes / No**

20 …  grows a lot of their own food              **Yes / No**

21 …  knows a lot about alternative medicine     **Yes / No**

22 …  is good at sewing                          **Yes / No**

**(B)** **If you need someone to help you in the following areas, would you be able to obtain this help from anyone within one week?**

**Do you know anyone who …?**                                    **How close are you to that person?**

Very close                                                                          Not very close

1  …   could give you good financial advice           **Yes / No**   ├───────────────────────────────────────┤

2  …   could give advice on conflicts at work           **Yes / No**   ├───────────────────────────────────────┤

3  …   could help you to move house                       **Yes / No**   ├───────────────────────────────────────┤

4  …   could help with small jobs around the house  **Yes / No**   ├───────────────────────────────────────┤

5  …   could do your shopping when you are ill         **Yes / No**   ├───────────────────────────────────────┤

6  …   could give you medical advice                       **Yes / No**   ├───────────────────────────────────────┤

7  …   could lend you a large sum of money (eg £5000)   **Yes / No**   ├───────────────────────────────────────┤

8  …   could give you careers advice                        **Yes / No**   ├───────────────────────────────────────┤

9  …   could provide support if you suffer a bereavement   **Yes / No**   ├───────────────────────────────────────┤

**Do you know anyone who …?**

**How close are you to that person?**

Very close                                         Not very close

10 …  could discuss politics with you                    **Yes / No**

11 …  could give you legal advice                        **Yes / No**

12 …  could give you a good reference for a job          **Yes / No**

13 …  could baby-sit your children                       **Yes / No**

14 …  you could confide in                               **Yes / No**

15 …  you could go out socially with (eg to the cinema)  **Yes / No**

16 …  could provide support if you were a victim of
crime  **Yes / No**

**Now, please answer the following questions about yourself.**

**(C)    Do you have any of the following skills or resources?**

| | | | | | |
|---|---|---|---|---|---|
| 1 … | can repair a car | **Yes / No** | 13 … | works for the local council | **Yes / No** |
| 2 … | owns a car | **Yes / No** | 14 … | owns a successful business | **Yes / No** |
| 3 … | is a reliable plumber | **Yes / No** | 15 … | owns a holiday home abroad | **Yes / No** |
| 4 … | is fluent in another language | **Yes / No** | 16 … | can sometimes employ people | **Yes / No** |
| 5 … | can repair computers | **Yes / No** | 17 … | knows a lot about government regulations | **Yes / No** |
| 6 … | can play a musical instrument | **Yes / No** | 18 … | has good contacts with the media | **Yes / No** |
| 7 … | has a good knowledge of literature | **Yes / No** | 19 … | has time to help other people | **Yes / No** |
| 8 … | has a higher degree (eg MA, PhD) | **Yes / No** | 20 … | grows a lot of their own food | **Yes / No** |
| 9 … | is a good gardener | **Yes / No** | 21 … | knows a lot about alternative medicine | **Yes / No** |
| 10 … | has a professional occupation | **Yes / No** | 22 … | is good at sewing | **Yes / No** |
| 11 … | is a local councillor | **Yes / No** | | | |
| 12 … | successfully trades shares | **Yes / No** | | | |

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## Resource Generator-UK (α3)

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The following questions are about the people you currently know.  These might be family members, friends or acquaintances, but they do not include friends of friends or people that you are not *personally* in contact with.

The questions will ask if you know someone with a particular skill, resource or occupation.  For each one, please circle 'yes' if you know someone. Then place a mark on the line next to the question indicating how close you are to that person. If you are very close to that person (e.g. they are your partner or within your immediate family), place your mark closer to the left side:

```
e.g.          Very close                              Not very close
              ├──────/────────────────────────────────────────────┤
```

Or, if you are not very close to that person (e.g. you know their name and would have a small conversation with them if you met them in the street), place your mark closer to the right side:

```
e.g.          Very close                              Not very close
              ├─────────────────────────────────────────/──────────┤
```

Or, if you are quite close to that person (e.g. a friend or colleague), place you mark closer to the centre:

```
e.g.          Very close                              Not very close
              ├──────────────────────────/─────────────────────────┤
```

If you know someone with more than one skill, resource or occupation, you can list this person more than once.

If you do not know anyone with that particular skill, resource or occupation, please circle 'no'.

**(A)** **Do you personally know anyone with the skill or resource listed below that you are able to gain access to within one week if you need it?** (Please answer all these questions, even if you possess the skill or resource. You will be asked about this in part C)

**How close are you to that person?**

**Do you currently have access to someone who …?**   Very close                                              Not very close

1  …   can repair a broken-down car            **Yes / No**

2  …   owns a car                              **Yes / No**

3  …   is a reliable plumber                   **Yes / No**

4  …   is fluent in another language           **Yes / No**

5  …   can repair computers                    **Yes / No**

6  …   can play a musical instrument           **Yes / No**

7  …   has a good knowledge of literature      **Yes / No**

8  …   has a higher degree (eg MA, PhD)        **Yes / No**

9  …   is good at gardening                    **Yes / No**

10  …  has a professional occupation           **Yes / No**

11  …  is a local councillor                   **Yes / No**

12  …  successfully trades shares              **Yes / No**

13  …  works for the local council             **Yes / No**

14  …  owns a successful business              **Yes / No**

15  …  owns a holiday home abroad              **Yes / No**

16  …  can sometimes employ people             **Yes / No**

17  …  knows a lot about government regulations **Yes / No**

18  …  has good contacts with the media        **Yes / No**

19  …  has time to help other people           **Yes / No**

20  …  grows a lot of their own food           **Yes / No**

21  …  knows a lot about alternative medicine  **Yes / No**

22  …  is good at sewing                       **Yes / No**

(B)     If you need someone to help you in the following areas, would you be able to obtain this help from anyone within one week?

**Do you currently personally know anyone who would…?**

**How close are you to that person?**

Very close                                                                 Not very close

| | | |
|---|---|---|
| 1 …  give you good financial advice | **Yes / No** | |
| 2 …  give advice on conflicts at work | **Yes / No** | |
| 3 …  help you to move house | **Yes / No** | |
| 4 …  help with small jobs around the house | **Yes / No** | |
| 5 …  do your shopping when you are ill | **Yes / No** | |
| 6 …  give you medical advice | **Yes / No** | |
| 7 …  lend you a large sum of money (eg £5000) | **Yes / No** | |
| 8 …  give you careers advice | **Yes / No** | |
| 9 …  provide support if you suffer a bereavement | **Yes / No** | |
| 10 …  discuss politics with you | **Yes / No** | |
| 11 …  give you legal advice | **Yes / No** | |
| 12 …  give you a good reference for a job | **Yes / No** | |
| 13 …  baby-sit your children | **Yes / No** | |
| 14 …  allow you to confide in them | **Yes / No** | |
| 15 …  go out socially with you (eg to the cinema) | **Yes / No** | |
| 16 …  provide support if you were a victim of crime | **Yes / No** | |

**Now, please answer the following questions about yourself**

**(C)    Are you …?**

| | | |
|---|---|---|
| 1 … | able to repair a car | **Yes / No** |
| 2 … | a car owner | **Yes / No** |
| 3 … | a reliable plumber | **Yes / No** |
| 4 … | fluent in another language | **Yes / No** |
| 5 … | able to repair computers | **Yes / No** |
| 6 … | able to play a musical instrument | **Yes / No** |
| 7 … | someone with a good knowledge of literature | **Yes / No** |
| 8 … | someone with a higher degree (eg MA, PhD) | **Yes / No** |
| 9 … | good at gardening | **Yes / No** |
| 10 … | someone with a professional occupation | **Yes / No** |
| 11 … | a local councillor | **Yes / No** |
| 12 … | successful at trading shares | **Yes / No** |
| 13 … | working for the local council | **Yes / No** |
| 14 … | an owner of a successful business | **Yes / No** |
| 15 … | an owner of a holiday home abroad | **Yes / No** |
| 16 … | able to sometimes employ people | **Yes / No** |
| 17 … | knowledgeable about government regulations | **Yes / No** |
| 18 … | someone with good contacts with the media | **Yes / No** |
| 19 … | someone who has time to help other people | **Yes / No** |
| 20 … | someone who grows a lot of their own food | **Yes / No** |
| 21 … | knowledgeable about alternative medicine | **Yes / No** |

22 … good at sewing **Yes / No**

**(D)    How many people do you know who you can readily ask for advice, support or other resources?**

**(E)    Which of the following clubs, groups or associations are you actively involved in (if any)?**

(Please tick any that apply)

- ☐ Sports club
- ☐ Sports supporters club
- ☐ Social club
- ☐ Volunteer group (eg St John's ambulance)
- ☐ Timebank (volunteering your time and skills)
- ☐ Hobby / interest group
- ☐ Church / religious group
- ☐ Campaigning group
- ☐ Political party
- ☐ Tenants group / resident's association
- ☐ Other (please specify………………………………..)
- ☐ None of these

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**Resource Generator-UK (α4)**

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## Instructions

The following questions are about the people you <u>currently</u> know.  These might be family members, friends or acquaintances, but they do not include friends of friends or people that you are not <u>personally</u> in contact with.

*The questions will ask if you know someone with a particular skill, resource or occupation.  For example:*

Please tick the 'yes' column if you currently have access to someone or 'no' if you don't.

If 'yes', then please tick the column(s) corresponding to the person or people you would be likely to approach if you needed that particular skill or resource.

| Do you currently have access to someone who … ? | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance | Professional only |
|---|---|---|---|---|---|---|---|---|---|
| 1 …can repair a broken-down car | | | | | | | | | |

If you <u>only personally know</u> a professional with that skill or resource whom you could approach if you needed to, please tick the 'professional only' column.

*If you know someone with more than one skill, resource or occupation, you can refer to this person more than once.*

**(A)   Do you personally know anyone with the skill or resource listed below that you are able to gain access to <u>within one week</u> if you needed it?**

Please answer all these questions, even if you possess the skill or resource or if you have never needed to ask for it before.  You will be asked about your skills later on.  If 'yes', you may tick more than one box.

| Do you currently have access to Someone who … ? | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance | Professional only |
|---|---|---|---|---|---|---|---|---|---|
| 1 … can repair a broken-down car | | | | | | | | | |
| 2 … owns a car | | | | | | | | | |
| 3 … is a reliable tradesman (eg plumber, electrician) | | | | | | | | | |
| 4 … can speak another language | | | | | | | | | |
| 5 … knows how to fix problems with computers | | | | | | | | | |
| 6 … is good at gardening | | | | | | | | | |
| 7 … has a professional occupation | | | | | | | | | |
| 8 … is a local councillor | | | | | | | | | |
| 9 … works for the local council | | | | | | | | | |
| 10 … has a place where you can go for an enjoyable break | | | | | | | | | |
| 11 … can sometimes employ people | | | | | | | | | |
| 12 … knows a lot about government regulations | | | | | | | | | |
| 13 … has good contacts with the local newspaper, radio or t.v. | | | | | | | | | |
| 14 … has time to help other people | | | | | | | | | |
| 15 … knows a lot about health and fitness | | | | | | | | | |
| 16 … is good at sewing | | | | | | | | | |
| 17 … knows a lot about DIY | | | | | | | | | |

**(B)** **If you need someone to help you in the following areas, would you be able to obtain this help from anyone <u>within one week</u>?**

Please answer all these questions, even if you have never needed to ask for it before.  If 'yes', you may tick more than one box.

| Do you currently personally know Anyone who would … ? | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance | Professional only |
|---|---|---|---|---|---|---|---|---|---|
| 1 … give you sound advice about money problems | | | | | | | | | |
| 2 … give you sound advice on problems at work | | | | | | | | | |
| 3 … help you to move or dispose of bulky items (eg lifting or use of a van) | | | | | | | | | |
| 4 … help you with small jobs around the house | | | | | | | | | |
| 5 … do your shopping if you are ill | | | | | | | | | |
| 6 … give you sound medical advice | | | | | | | | | |
| 7 … lend you a small amount of money (eg for a local taxi fare) | | | | | | | | | |
| 8 … give you careers advice | | | | | | | | | |
| 9 … discuss politics with you | | | | | | | | | |
| 10 … give you sound legal advice | | | | | | | | | |
| 11 … give you a good reference for a job | | | | | | | | | |
| 12 … baby-sit your children (if you have any) | | | | | | | | | |
| 13 … go out socially with you (eg to the cinema or the pub) | | | | | | | | | |
| 14 … get you cheap goods or 'bargains' | | | | | | | | | |
| 15 … help you to find somewhere to live if you had to move home | | | | | | | | | |
| 16 … lend you a large amount of money (eg for a deposit on a flat or house) | | | | | | | | | |
| 17 … look after your home or pets if you go away | | | | | | | | | |
| 18 … provide practical help in the event of a personal crisis (eg bereavement) | | | | | | | | | |

**(C)** **Approximately <u>how many people</u> can you currently ask for help or assistance if you needed to?**

Please tick one box for each row.

| | 0 | 1 | 2-3 | 4-5 | 6-10 | 11-20 | 21+ |
|---|---|---|---|---|---|---|---|
| Immediate family | | | | | | | |
| Wider family | | | | | | | |
| Friends | | | | | | | |
| Neighbours | | | | | | | |
| Colleagues | | | | | | | |
| Acquaintances | | | | | | | |

**(D)** **Please answer the following questions about yourself:**

| Are you … ? | Yes | No |
|---|---|---|
| 1 … able to repair a broken-down car | | |
| 2 … a car owner | | |
| 3 … a tradesman (eg plumber, electrician) | | |
| 4 … able to speak another language | | |
| 5 … knowledgeable about fixing problems with computers | | |
| 6 … good at gardening | | |
| 7 … someone with a professional occupation | | |
| 8 … a local councillor | | |
| 9 … working for the local council | | |
| 10 … an owner of a holiday or second home | | |
| 11 … able to sometimes employ people | | |
| 12 … knowledgeable about government regulations | | |
| 13 … someone with good contacts with a local newspaper, radio or t.v. | | |
| 14 … knowledgeable about health and fitness | | |
| 15 … good at sewing | | |
| 16 … knowledgeable about DIY | | |

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**Resource Generator-UK (α5)**

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### How to complete this questionnaire

The following questions are about the people you <u>currently</u> know.  These might be family members, friends or acquaintances, but they do not include friends of friends or people that you are not <u>personally </u>in contact with.

*The questions will ask if you currently know someone with a particular skill, resource or occupation.  For example, do you currently have access to someone who can repair a broken-down car?  Please follow the guidance below in how to answer the questions.*

Please tick the 'yes' column if you currently have access to someone or 'no' if you don't.

If 'yes', then please tick the column(s) corresponding to the person or people you would be likely to approach if you needed that particular skill or resource.

| Do you currently have access to someone who … ? | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance | Professional only |
|---|---|---|---|---|---|---|---|---|---|
| 1 …can repair a broken-down car | | | | | | | | | |

If you <u>only</u> know a professional with that skill or resource whom you could approach if you needed to, please tick the 'professional only' column. But only tick this column if you know them <u>personally</u>.

*If you know someone with more than one skill, resource or occupation, you can refer to this person more than once.*

It should take you no longer than 10-15 minutes to complete this questionnaire.

---

**(A)** **Do you personally know anyone with the skill or resource listed below that you are able to gain access to <u>within one week</u> if you needed it?**

Please answer all these questions, even if you possess the skill or resource yourself or if you have never needed to ask for it before. You will be asked about your skills later on. If 'yes', you may tick more than one box.

| Do you currently have access to someone who … ? | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance | Professional only |
|---|---|---|---|---|---|---|---|---|---|
| 1 … can repair a broken-down car | | | | | | | | | |
| 2 … owns a car | | | | | | | | | |
| 3 … is a reliable tradesman (eg plumber, electrician) | | | | | | | | | |
| 4 … can speak another language | | | | | | | | | |
| 5 … knows how to fix problems with computers | | | | | | | | | |
| 6 … is good at gardening | | | | | | | | | |
| 7 … has a professional occupation | | | | | | | | | |
| 8 … is a local councillor | | | | | | | | | |
| 9 … works for the local council | | | | | | | | | |
| 10 … has a place where you can go for an enjoyable break | | | | | | | | | |
| 11 … can sometimes employ people | | | | | | | | | |
| 12 … knows a lot about government regulations | | | | | | | | | |
| 13 … has good contacts with the local newspaper, radio or t.v. | | | | | | | | | |
| 14 … has time to help other people | | | | | | | | | |
| 15 … knows a lot about health and fitness | | | | | | | | | |
| 16 … is good at sewing | | | | | | | | | |
| 17 … knows a lot about DIY | | | | | | | | | |

**(B)** **If you need someone to help you in the following areas, would you be able to obtain this help from anyone <u>within one week</u>?**

Please answer all these questions, even if you have never needed to ask for it before. If 'yes', you may tick more than one box.

| Do you currently personally know anyone who would … ? | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance | Professional only |
|---|---|---|---|---|---|---|---|---|---|
| 1 … give you sound advice about money problems | | | | | | | | | |
| 2 … give you sound advice on problems at work | | | | | | | | | |
| 3 … help you to move or dispose of bulky items (eg lifting or use of a van) | | | | | | | | | |
| 4 … help you with small jobs around the house | | | | | | | | | |
| 5 … do your shopping if you are ill | | | | | | | | | |
| 6 … give you sound medical advice | | | | | | | | | |
| 7 … lend you a small amount of money (eg for a local taxi fare) | | | | | | | | | |
| 8 … give you careers advice | | | | | | | | | |
| 9 … discuss politics with you | | | | | | | | | |
| 10 … give you sound legal advice | | | | | | | | | |
| 11 … give you a good reference for a job | | | | | | | | | |
| 12 … baby-sit your children (if you have any) | | | | | | | | | |
| 13 … go out socially with you (eg to the cinema or the pub) | | | | | | | | | |
| 14 … get you cheap goods or 'bargains' | | | | | | | | | |
| 15 … help you to find somewhere to live if you had to move home | | | | | | | | | |
| 16 … lend you a large amount of money (eg for a deposit on a flat or house) | | | | | | | | | |
| 17 … look after your home or pets if you go away | | | | | | | | | |
| 18 … provide practical help in the event of a personal crisis (eg bereavement) | | | | | | | | | |

**(C)** **Approximately <u>how many people</u> can you currently ask for any kind of help or assistance if you needed to?**

Please tick one box for each row.

|  | 0 | 1 | 2-3 | 4-5 | 6-10 | 11-20 | 21+ |
|---|---|---|---|---|---|---|---|
| Immediate family |  |  |  |  |  |  |  |
| Wider family |  |  |  |  |  |  |  |
| Friends |  |  |  |  |  |  |  |
| Neighbours |  |  |  |  |  |  |  |
| Colleagues |  |  |  |  |  |  |  |
| Acquaintances |  |  |  |  |  |  |  |

**(D)** **Please answer the following questions about yourself.**

**Gender:** Male ☐   Female ☐

**Age** (in years)**:** ☐☐   **Occupation:** …………………………..…………….

**Marital Status:** ☐ Single   ☐ Divorced
☐ Married / cohabiting   ☐ Widowed

**Ethnic Origin:** ☐ White British   ☐ Pakistani
☐ Black Caribbean   ☐ Bangladeshi
☐ Black African   ☐ Chinese
☐ Black Other   ☐ Mixed parentage
☐ Indian   ☐ Other (please specify)……………

| Are you … ? | Yes | No |
|---|---|---|
| 1 … able to repair a broken-down car |  |  |
| 2 … a car owner |  |  |
| 3 … a tradesman (eg plumber, electrician) |  |  |
| 4 … able to speak another language |  |  |
| 5 … knowledgeable about fixing problems with computers |  |  |
| 6 … good at gardening |  |  |
| 7 … someone with a professional occupation |  |  |
| 8 … a local councillor |  |  |
| 9 … working for the local council |  |  |
| 10 … an owner of a holiday or second home |  |  |
| 11 … able to sometimes employ people |  |  |
| 12 … knowledgeable about government regulations |  |  |
| 13 … someone with good contacts with a local newspaper, radio or t.v. |  |  |
| 14 … knowledgeable about health and fitness |  |  |
| 15 … good at sewing |  |  |
| 16 … knowledgeable about DIY |  |  |

| Resource Generator-UK (β) |
|---|

## How to complete this questionnaire

The following questions are about the people you <u>currently</u> know. These might be family members, friends or acquaintances, but they do not include friends of friends or people that you are not <u>personally</u> in contact with. The questions will ask if you currently know someone with a particular skill, resource or occupation - e.g.:

| Do you currently have access to someone who … ? | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance |
|---|---|---|---|---|---|---|---|---|
| 1 … can repair a broken-down car | | | | | | | | |

Please tick the 'yes' column if you currently have access to someone or 'no' if you don't.

If 'yes', then please tick the column(s) corresponding to the person or people you would be likely to approach if you needed that particular skill or resource.

*If you know someone with more than one skill, resource or occupation, you can refer to this person more than once.*

**Please answer all the questions. The questionnaire should take you no longer than 10-15 minutes to complete. Thank you.**

**Firstly, please answer the following questions about yourself:-**

**Gender:** ☐ Male  ☐ Female  **Age** (in years)**:** ☐☐

**Marital Status:** ☐ Single  ☐ Divorced
☐ Married / cohabiting  ☐ Widowed

**Ethnic Origin:**
☐ White British  ☐ Pakistani
☐ Black Caribbean  ☐ Bangladeshi
☐ Black African  ☐ Chinese
☐ Black Other  ☐ Mixed parentage
☐ Indian  ☐ Other (please specify:…………………)

**Employment status:**
(please tick one)
☐ Employed or self employed (**Occupation**:……………………)
☐ Full-time student (**Course**:………………………………………)
☐ Unable to work due to disability or health problem
☐ Unemployed  ☐ Looking after the home full-time
☐ Retired  ☐ Carer

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**(A)** **Do you personally know anyone with the skill or resource listed below that you are able to gain access to <u>within one week</u> if you needed it?**

Please answer all these questions, even if you possess the skill or resource yourself or if you have never needed to ask for it before. You will be asked about your skills later on. If 'yes', you may tick more than one box.

| Do you currently have access to someone who … ? | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance |
|---|---|---|---|---|---|---|---|---|
| 1 … can repair a broken-down car | | | | | | | | |
| 2 … is a reliable tradesman (eg plumber, electrician) | | | | | | | | |
| 3 … can speak another language fluently | | | | | | | | |
| 4 … knows how to fix problems with computers | | | | | | | | |
| 5 … is good at gardening | | | | | | | | |
| 6 … has a professional occupation | | | | | | | | |
| 7 … is a local councillor | | | | | | | | |
| 8 … works for your local council | | | | | | | | |
| 9 … can sometimes employ people | | | | | | | | |
| 10 … knows a lot about government regulations | | | | | | | | |
| 11 … has good contacts with the local newspaper, radio or t.v. | | | | | | | | |
| 12 … knows a lot about health and fitness | | | | | | | | |
| 13 … knows a lot about DIY | | | | | | | | |

**(B)** **If you need someone to help you in the following areas, would you be able to obtain this help from anyone <u>within one week</u>?**

Please answer all these questions, even if you have never needed to ask for it before.  If 'yes', you may tick more than one box.

| Do you currently personally know anyone who would … ? | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance |
|---|---|---|---|---|---|---|---|---|
| 1 … give you sound advice about money problems | | | | | | | | |
| 2 … give you sound advice on problems at work | | | | | | | | |
| 3 … help you to move or dispose of bulky items (eg lifting or use of a van) | | | | | | | | |
| 4 … help you with small jobs around the house | | | | | | | | |
| 5 … do your shopping if you are ill | | | | | | | | |
| 6 … lend you a small amount of money (eg for a local taxi fare) | | | | | | | | |
| 7 … give you careers advice | | | | | | | | |
| 8 … discuss politics with you | | | | | | | | |
| 9 … give you sound legal advice | | | | | | | | |
| 10 … give you a good reference for a job | | | | | | | | |
| 11 … get you cheap goods or 'bargains' | | | | | | | | |
| 12 … help you to find somewhere to live if you had to move home | | | | | | | | |
| 13 … lend you a large amount of money (eg for a deposit on a flat or house) | | | | | | | | |
| 14 … look after your home or pets if you go away | | | | | | | | |

| Are you … ? | Yes | No |
|---|---|---|
| 1 … able to repair a broken-down car | | |
| 2 … a tradesman (eg plumber, electrician) | | |
| 3 … able to speak another language fluently | | |
| 4 … knowledgeable about fixing problems with computers | | |
| 5 … good at gardening | | |
| 6 … someone with a professional occupation | | |
| 7 … a local councillor | | |
| 8 … working for your local council | | |
| 9 … able to sometimes employ people | | |
| 10 … knowledgeable about government regulations | | |
| 11 … someone with good contacts with a local newspaper, radio or t.v. | | |
| 12 … knowledgeable about health and fitness | | |
| 13 … knowledgeable about DIY | | |

**Appendix B: Developmental versions of the
Position Generator-UK**

## Position Generator-UK (α1)

### Do you currently know anyone with the following occupations?

For each occupation, please tick only **one** of the columns corresponding to the person who is closest to you. This measure assumes that family members are closest, followed by friends and then acquaintances. The following definitions of these apply:

| Immediate Family | Wider Family | Friends | Colleague or Acquaintance |
|---|---|---|---|
| Parents, children, siblings or other household members | Grandparents, grandchildren, aunts, uncles, cousins etc not in your immediate family | Someone outside your family whom you could visit uninvited | Someone that you would have a small conversation with on the street or at work and whose name you know |

| Do you know anyone who is a … ? | Immediate Family | Wider Family | Friend | Coll. / Acquaintance | No | Do you know anyone who is a … ? | Immediate Family | Wider Family | Friend | Coll. / Acquaintance | No |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Artist | | | | | | Fishmonger | | | | | |
| Sales assistant | | | | | | Member of armed forces | | | | | |
| Machine operator | | | | | | Security guard | | | | | |
| Gardener | | | | | | Market trader | | | | | |
| Laboratory technician | | | | | | Doctor | | | | | |
| Postman / woman | | | | | | Taxi driver | | | | | |
| Member of Parliament | | | | | | Community worker | | | | | |
| Administrator | | | | | | Construction worker | | | | | |
| Academic researcher | | | | | | Post office clerk | | | | | |
| Estate agent | | | | | | Shopkeeper | | | | | |
| Scientist | | | | | | School teacher | | | | | |
| Travel agent | | | | | | Bank Manager | | | | | |
| Countryside warden | | | | | | Childminder | | | | | |
| Electrician | | | | | | Plumber | | | | | |
| Call centre operator | | | | | | Receptionist | | | | | |
| Care assistant | | | | | | Mechanic | | | | | |
| Labourer | | | | | | Librarian | | | | | |

## Position Generator-UK (α2)

(See Resource Generator-UK (α3) for instructions on completion.)

**Do you currently personally know anyone with the following occupations?**

(If you know more than one person, please mark on the scale for the person closest to you)

**Do you currently personally know anyone who is a/an …?**

**How close are you to that person?**

Very close                                                          Not very close

| 1 … | Artist | **Yes / No** |
| 2 … | Sales assistant | **Yes / No** |
| 3 … | Factory worker | **Yes / No** |
| 4 … | Gardener | **Yes / No** |
| 5 … | Postal worker | **Yes / No** |
| 6 … | Member of Parliament | **Yes / No** |
| 7 … | Secretary | **Yes / No** |
| 8 … | Estate agent | **Yes / No** |
| 9 … | Scientist | **Yes / No** |
| 10 … | Travel agent | **Yes / No** |
| 11 … | Electrician | **Yes / No** |
| 12 … | Labourer | **Yes / No** |
| 13 … | Farmer | **Yes / No** |
| 14 … | Solicitor | **Yes / No** |
| 15 … | Religious leader | **Yes / No** |

**Do you currently personally know anyone who is a/an …?**

**How close are you to that person?**

Very close                                          Not very close

16  …  Journalist                  **Yes / No**

17  …  Butcher                     **Yes / No**

18  …  Member of the armed forces  **Yes / No**

19  …  Police officer              **Yes / No**

20  …  Street trader               **Yes / No**

21  …  Doctor                      **Yes / No**

22  …  Taxi driver                 **Yes / No**

23  …  Civil servant               **Yes / No**

24  …  School teacher              **Yes / No**

25  …  Bank manager                **Yes / No**

26  …  Childminder                 **Yes / No**

27  …  Librarian                   **Yes / No**

28  …  Accountant                  **Yes / No**

29  …  Builder                     **Yes / No**

30  …  Nurse                       **Yes / No**

31  …  Publican                    **Yes / No**

32  …  Undertaker                  **Yes / No**

## Position Generator-UK (α3)

(See Resource Generator-UK (α4) for instructions on completion.)

| Do you currently personally know anyone who is a/an … ?<br><br>(If 'yes', you may tick more than one box) | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance | Professional only |
|---|---|---|---|---|---|---|---|---|---|
| 1 … Artist | | | | | | | | | |
| 2 … Sales assistant | | | | | | | | | |
| 3 … Factory worker | | | | | | | | | |
| 4 … Judge | | | | | | | | | |
| 5 … Gardener | | | | | | | | | |
| 6 … Postal worker | | | | | | | | | |
| 7 … Member of Parliament | | | | | | | | | |
| 8 … Secretary | | | | | | | | | |
| 9 … Travel agent | | | | | | | | | |
| 10 … University professor | | | | | | | | | |
| 11 … Estate agent | | | | | | | | | |
| 12 … Window cleaner | | | | | | | | | |
| 13 … Small farmer | | | | | | | | | |
| 14 … Solicitor | | | | | | | | | |
| 15 … Religious leader (eg priest, mullah) | | | | | | | | | |
| 16 … Journalist | | | | | | | | | |
| 17 … Butcher | | | | | | | | | |
| 18 … Police constable | | | | | | | | | |
| 19 … Street trader | | | | | | | | | |
| 20 … Doctor (of medicine) | | | | | | | | | |
| 21 … Taxi driver | | | | | | | | | |
| 22 … School teacher | | | | | | | | | |
| 23 … Childminder | | | | | | | | | |
| 24 … Librarian | | | | | | | | | |
| 25 … Accountant | | | | | | | | | |
| 26 … Builder | | | | | | | | | |
| 27 … Nurse | | | | | | | | | |
| 28 … Publican | | | | | | | | | |
| 29 … Undertaker | | | | | | | | | |
| 30 … Call centre operator | | | | | | | | | |

## Position Generator-UK (β)

(See Resource Generator-UK (β) for instructions on completion.)

| Do you currently personally know anyone who is a/an … ? If 'yes', you may tick more than one box. | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance |
|---|---|---|---|---|---|---|---|---|
| 1 … Sales assistant | | | | | | | | |
| 2 … Factory worker | | | | | | | | |
| 3 … Gardener | | | | | | | | |
| 4 … Member of Parliament | | | | | | | | |
| 5 … Secretary | | | | | | | | |
| 6 … Travel agent | | | | | | | | |
| 7 … University professor | | | | | | | | |
| 8 … Estate agent | | | | | | | | |
| 9 … Small farmer | | | | | | | | |
| 10 … Solicitor | | | | | | | | |
| 11 … Journalist | | | | | | | | |
| 12 … Butcher | | | | | | | | |
| 13 … Police constable | | | | | | | | |
| 14 … Street trader | | | | | | | | |
| 15 … School teacher | | | | | | | | |
| 16 … Accountant | | | | | | | | |
| 17 … Builder | | | | | | | | |
| 18 … Nurse | | | | | | | | |
| 19 … Undertaker | | | | | | | | |
| 20 … Call centre operator | | | | | | | | |

**Appendix C: Additional data supporting instrument developmental**

**Table C1        Occupations selected for Position Generator-UK**

| Occupational group | Prestige score | Selected occupations |
|---|---|---|
| Corporate managers | 36 | Member of Parliament, bank manager |
| Science and technology professionals | 32 | Scientist * |
| Health professionals | 32 | Doctor * |
| Teaching and research professionals | 32 | Academic researcher, school teacher * |
| Business and public service professionals | 32 | Librarian |
| Managers and proprietors in agriculture and services | 27 | Shopkeeper |
| Science and technology associate professionals | 21 | Laboratory technician |
| Health and social welfare associate professionals | 21 | Community worker |
| Protective service occupations | 21 | Member of armed forces |
| Culture, media and sports occupations | 21 | Artist * |
| Business and public service associate professionals | 21 | Estate agent *, countryside warden |
| Skilled agricultural trades | 15 | Gardener |
| Skilled metal and electrical trades | 15 | Mechanic *, electrician |
| Skilled construction and building trades | 15 | Plumber |
| Textiles, printing and other skilled trades | 15 | Fishmonger |
| Administrative occupations | 12 | Administrator *, post office clerk |
| Secretarial and related occupations | 12 | Receptionist |
| Caring personal service occupations | 8 | Care assistant, childminder |
| Leisure and other personal service occupations | 8 | Travel agent |
| Sales occupations | 6 | Sales assistant *, market trader |
| Customer service occupations | 6 | Call centre operator |
| Process, plant and machine operatives | 4 | Machine operator, construction worker * |
| Transport and mobile machine drivers and operatives | 4 | Taxi driver |
| Elementary trades, plant and storage related occupations | 1 | Labourer * |
| Elementary administration and service occupations | 1 | Security guard, postman / woman * |

* Occupation used in SSND Position Generator

**Table C2        Demographic characteristics of Croydon and Doncaster**

|  | Croydon n=330,587 (%) | Doncaster n=286,866 |
|---|---|---|
| **Sex** | | |
| Male | 158,682 (48.0) | 140,564 (49.0) |
| Female | 171,905 (52.0) | 146,302 (51.0) |
| **Age** | | |
| <30 | 132,235 (40.0) | 105,763 (36.9) |
| 30-60 | 141,822 (42.9) | 119,468 (41.6) |
| >60 | 56,530 (17.1) | 61,635 (21.5) |
| **Marital status*** | | |
| Single (never married) | 91,934 (27.8) | 58,591 (20.4) |
| Married or re-married | 119,855 (36.3) | 122,037 (42.5) |
| Separated | 7,774 (2.4) | 5,156 (1.8) |
| Divorced | 20,603 (6.2) | 21,023 (7.3) |
| Widowed | 17,973 (5.4) | 20,087 (7.0) |
| **Ethnic group** | | |
| White | 232,072 (70.2) | 280,190 (97.7) |
| Mixed | 12,232 (3.7) | 1,684 (0.6) |
| Asian | 37,356 (11.3) | 3,128 (1.1) |
| Black | 43,968 (13.3) | 1,133 (0.4) |
| Chinese or other ethnic group | 4,959 (1.5) | 731 (0.2) |
| **Economic activity** | | |
| Employed | 210,253 (63.6) | 160,644 (56.0) |
| Unemployed | 12,562 (3.8) | 12,048 (4.2) |
| Students | 23,472 (7.1) | 13,769 (4.8) |
| Retired | 36,695 (11.1) | 43,890 (15.3) |
| Looking after home | 23,472 (7.1) | 21,805 (7.6) |
| Permanently sick or disabled | 12,562 (3.8) | 23,809 (8.3) |
| Economically inactive | 11,571 (3.5) | 10,901 (3.8) |

*People aged 16+, 2001 census (ONS, 2003)

**Table C3**      **Prestige scores for PG-UK (α3)**

| Occupation | SOC code* | Prestige Score |
|---|---|---|
| Artist | 3411 | 198 |
| Sales assistant | 7111 | 58 |
| Factory worker | 9139 | 9 |
| Judge | 2411 (2111) | 316 |
| Gardener | 5113 | 147 |
| Postal worker | 9211 | 8 |
| Member of Parliament | 1111 | 356 |
| Secretary | 4215 | 116 |
| Travel agent | 6212 | 76 |
| University professor | 2311 | 308 |
| Estate agent | 3544 | 194 |
| Window cleaner | 9231 | 8 |
| Small farmer | 5111 | 147 |
| Solicitor | 2411 (2115) | 315 |
| Religious leader | 2444 | 302 |
| Journalist | 3431 | 197 |
| Butcher | 5431 | 137 |
| Police constable | 3312 | 201 |
| Street trader | 7124 | 58 |
| Doctor (of medicine) | 2211 | 312 |
| Taxi driver | 8214 | 36 |
| School teacher | 2314 | 307 |
| Childminder | 6122 | 78 |
| Librarian | 2451 | 302 |
| Accountant | 2421 | 303 |
| Builder | 5319 | 140 |
| Nurse | 3211 | 204 |
| Publican | 1224 | 263 |
| Undertaker | 6291 | 74 |
| Call centre operator | 7211 | 56 |

* Office for National Statistics, 2000

**Table C4          Phase 1 pilot sample size by electoral ward**

| Electoral Ward | Population (2001 census) | Edited electoral register May 2004 (% of total) | Sample (% of total) |
|---|---|---|---|
| **Croydon** | | | |
| Ashburton | 13,560 | 8,219 (24.2) | 239 (23.9) |
| Selhurst | 14,591 | 8,907 (26.3) | 261 (26.1) |
| Sub-total | 28,151 | 17,126 (50.5) | 500 (50.0) |
| **Doncaster** | | | |
| Armthorpe | 17,382 | 8,622 (25.4) | 251 (25.1) |
| Torne Valley | * | 8,168 (24.1) | 249 (24.9) |
| Sub-total | * | 16,790 (49.5) | 500 (50.0) |
| Total | * | 33,916 (100) | 1000 (100) |

\* Data was unavailable as Torne Valley ward was created
from the old wards of Southern Parks and South East

**Table C5          Phase 1 pilot response rate**

| Electoral Ward | Sample | Ineligible | Eligible sample | Respondents (adjusted response rate) |
|---|---|---|---|---|
| **Croydon** | | | | |
| Ashburton | 239 | 4 | 235 | 72 (30.6%) |
| Selhurst | 261 | 3 | 258 | 68 (26.4%) |
| Sub-total | 500 | 7 | 493 | 140 (28.4%) |
| **Doncaster** | | | | |
| Armthorpe | 251 | 1 | 250 | 67 (26.8%) |
| Torne Valley | 249 | 3 | 246 | 88 (35.8%) |
| Sub-total | 500 | 4 | 496 | 155 (31.3%) |
| Total | 1000 | 11 | 989 | 295 (29.8%) |

**Table C6          Phase 1 pilot non-response by sex and ward**

| Variable | Responders (%) | Non-responders (%) | $\chi^2$ | df | p |
|---|---|---|---|---|---|
| **Sex** | | | | | |
| Male | 120 (40.7) | 352 (50.7) | | | |
| Female | 175 (59.3) | 336 (48.4) | | | |
| Not known | 0 (0) | 6 (0.9) | 11.69 | 2 | 0.0029 |
| Total | 295 | 694 | | | |
| **Ward** | | | | | |
| Ashburton | 72 (24.4) | 163 (23.5) | | | |
| Selhurst | 68 (23.1) | 190 (27.4) | | | |
| Armthorpe | 67 (22.7) | 183 (26.4) | | | |
| Torne Valley | 88 (29.8) | 158 (22.8) | 6.81 | 3 | 0.078 |
| Total | 295 | 694 | | | |

**Table C7        Phase 1 pilot sample demographics**

| Variable | Sample n=295 (%) | Croydon sample n=140 (%) | Croydon (%, 2001 Census) | Doncaster sample n=155 (%) | Doncaster (%, 2001 Census) |
|---|---|---|---|---|---|
| **Sex** | | | | | |
| Male | 120 (40.7) | 53 (37.9) | 47.3* | 67 (43.2) | 48.3* |
| Female | 175 (59.3) | 87 (62.1) | 52.7* | 88 (56.8) | 51.7* |
| Total | 295 | 140 | | 155 | |
| **Age** | | | | | |
| Mean (s.d.) | 46.1(16.3) | 42.5 (15.3) | 44.8* | 49.3 (16.6) | 47.2* |
| Range | 16-95 | 18-95 | | 16-89 | |
| **Ethnicity** | | | | | |
| White British | 242 (82.0) | 88 (62.9) | 70.2[+] | 154 (99.4) | 97.7[+] |
| White other | 4 (1.4) | 4 (2.9) | 0.1[+] | 0 (0) | 0[+] |
| Black Caribbean | 14 (4.7) | 13 (9.3) | 7.9[+] | 1 (0.6) | 0.3[+] |
| Black African | 8 (2.7) | 8 (5.7) | 4.4[+] | 0 (0) | 0.1[+] |
| Black other | 5 (1.7) | 5 (3.6) | 1.0[+] | 0 (0) | 0[+] |
| Indian | 4 (1.4) | 4 (2.9) | 6.4[+] | 0 (0) | 0.4[+] |
| Pakistani | 5 (1.7) | 5 (3.6) | 2.2[+] | 0 (0) | 0.5[+] |
| Bangladeshi | 1 (0.3) | 1 (0.7) | 0.5[+] | 0 (0) | 0[+] |
| Chinese | 2 (0.7) | 2 (1.4) | 1.5[+] | 0 (0) | 0.3[+] |
| Asian other | 3 (1.0) | 3 (2.1) | 2.1[+] | 0 (0) | 0.1[+] |
| Mixed parentage | 7 (2.4) | 7 (5.0) | 3.7[+] | 0 (0) | 0.6[+] |
| Total | 295 | 140 | | 155 | |
| **Marital status** | | | | | |
| Single | 69 (23.4) | 45 (32.1) | 35.6* | 24 (15.5) | 25.8* |
| Married / cohabiting | 184 (62.4) | 78 (55.7) | 49.4* | 106 (68.4) | 56.1* |
| Divorced | 25 (8.5) | 11 (7.9) | 8.0* | 14 (9.0) | 9.3* |
| Widowed | 16 (5.4) | 5 (3.6) | 7.0* | 11 (7.1) | 8.8* |
| Not known | 1 (0.3) | 1 (0.7) | 0* | 0 | 0* |
| Total | 295 | 140 | | 155 | |

*Aged 16 and over (Office for National Statistics, 2003)

[+]All people (Office for National Statistics, 2003)

**Table C8        Phase 1 pilot sample by occupational group**

| Occupational group | Sample | Croydon sample n=140 (%) | Croydon (%, 2001 Census*) | Doncaster sample n=155 (%) | Doncaster (%, 2001 Census*) |
|---|---|---|---|---|---|
| Managers & senior officials | 30 (10.2) | 15 (10.7) | 10.2 | 15 (9.7) | 6.6 |
| Professional | 23 (7.8) | 14 (10.0) | 7.9 | 9 (5.8) | 4.2 |
| Associate prof. & technical | 31 (10.5) | 15 (10.7) | 10.0 | 16 (10.3) | 6.3 |
| Administrative & secretarial | 28 (9.5) | 15 (10.7) | 11.3 | 13 (8.4) | 6.2 |
| Skilled trades | 18 (6.1) | 10 (7.1) | 5.9 | 8 (5.2) | 7.4 |
| Personal service | 25 (8.5) | 11 (7.9) | 4.3 | 14 (9.0) | 4.6 |
| Sales and customer service | 10 (3.4) | 4 (2.9) | 5.2 | 6 (3.9) | 5.5 |
| Process, plant & machine operatives | 4 (1.4) | 2 (1.4) | 3.4 | 2 (1.3) | 6.6 |
| Elementary | 10 (3.4) | 4 (2.9) | 5.4 | 6 (3.9) | 8.6 |
| Employed – other | 8 (2.7) | 2 (1.4) | 0 | 6 (3.9) | 0 |
| Student | 16 (5.4) | 9 (6.4) | 7.1 | 7 (4.5) | 4.8 |
| Unemployed | 9 (3.1) | 5 (3.6) | 3.8 | 4 (2.6) | 4.2 |
| Unable to work due to disability | 3 (1.0) | 0 | 3.8 | 3 (1.9) | 8.4 |
| Retired | 53 (18.0) | 17 (12.1) | 11.1 | 36 (23.2) | 15.2 |
| Household duties | 16 (5.4) | 11 (7.9) | 7.1 | 5 (3.2) | 7.6 |
| Not known | 11 (3.7) | 6 (4.3) | 3.5 | 5 (3.2) | 3.8 |
| Total | 295 | 140 | | 155 | |

*Aged 16 and over (Office for National Statistics, 2003)

**Table C9    Phase 2 test-retest reliability sample demographics**

| Demographic | Proportion in 2001 census | Number required in sample of 50 | Number obtained (%) |
|---|---|---|---|
| Men | 49% | 25 | 17 (36.2) |
| Women | 51% | 25 | 30 (63.8) |
| Age 18-39 | 38% | 19 | 23 (48.9) |
| Age 40-59 | 35% | 18 | 16 (34.0) |
| Age 60+ | 27% | 13 | 8 (17.0) |
| White | 91% | 46 | 42 (89.4) |
| Other ethnicity | 9% | 4 | 5 (10.6) |
| Employed | 61% | 31 | 37 (78.7) |
| Not employed | 39% | 19 | 10 (21.3) |

**Table C10    Phase 2 main pilot sample size by electoral ward**

| Electoral Ward | Sampling frame * (% of total) | Sample (% of total) |
|---|---|---|
| **Croydon** | | |
| Ashburton | 7980 (24.2) | 239 (23.9) |
| Selhurst | 8646 (26.3) | 261 (26.1) |
| Sub-total | 16,626 (50.5) | 500 (50.0) |
| **Doncaster** | | |
| Armthorpe | 8371 (25.4) | 257 (25.7) |
| Torne Valley | 7919 (24.1) | 243 (24.3) |
| Sub-total | 16,290 (49.5) | 50 (50.0) |
| Total | 32,916 | 1000 |

* Edited Electoral Register (May 2004) minus pilot 1 sample

**Table C11    Phase 2 main pilot response rate**

| Electoral Ward | Sample | Ineligible | Eligible sample | Respondents (adjusted response rate) |
|---|---|---|---|---|
| **Croydon** | | | | |
| Ashburton | 239 | 5 | 234 | 89 (38.0) |
| Selhurst | 261 | 6 | 255 | 67 (26.3) |
| Sub-total | 500 | 11 | 489 | 156 (31.9) |
| **Doncaster** | | | | |
| Armthorpe | 257 | 0 | 257 | 94 (36.6) |
| Torne Valley | 243 | 4 | 239 | 85 (35.6) |
| Sub-total | 500 | 4 | 496 | 179 (36.1) |
| Total | 1000 | 15 | 985 | 335 (34.0) |

**Table C12 Phase 2 main pilot non-response by sex and ward**

| Variable | Responders n=335 (%) | Non-responders n=650 (%) | $\chi^2$ | df | p |
|---|---|---|---|---|---|
| **Sex** | | | | | |
| Male | 145 (43.3) | 337 (51.8) | 11.00 | 2 | 0.0041 |
| Female | 190 (56.7) | 306 (47.1) | | | |
| Not known | 0 (0) | 7 (1.1) | | | |
| **Ward** | | | | | |
| Ashburton | 89 (26.6) | 145 (22.3) | 9.50 | 3 | 0.0233 |
| Selhurst | 67 (20.0) | 188 (28.9) | | | |
| Armthorpe | 94 (28.1) | 163 (25.1) | | | |
| Torne Valley | 85 (25.4) | 154 (23.7) | | | |

**Table C13 Phase 2 main pilot sample demographics**

| Variable | Sample n=335 (%) | Croydon sample n=156 (%) | Croydon (%, 2001 Census) | Doncaster sample n=179 (%) | Doncaster (%, 2001 Census) |
|---|---|---|---|---|---|
| **Sex** | | | | | |
| Male | 145 (43.3) | 67 (42.9) | 47.3* | 78 (43.6) | 48.3* |
| Female | 190 (56.7) | 89 (57.1) | 52.7* | 101 (56.4) | 51.7* |
| **Age** | | | | | |
| Mean (s.d.) | 49.0 (16.4) | 48.4 (16.0) | 44.8* | 49.6 (16.7) | 47.2* |
| Range | 19-95 | 20-85 | | 19-95 | |
| **Ethnicity** | | | | | |
| White British | 279 (83.3) | 107 (68.6) | 70.2[+] | 172 (97.2) | 97.7[+] |
| White other | 9 (2.7) | 8 (5.1) | 0.1[+] | 1 (0.6)) | 0[+] |
| Black Caribbean | 11 (3.3) | 11 (7.1) | 7.9[+] | 0 (0) | 0.3[+] |
| Black African | 15 (4.5) | 15 (9.6) | 4.4[+] | 0 (0) | 0.1[+] |
| Black other | 4 (1.2) | 4 (2.6) | 1.0[+] | 0 (0) | 0[+] |
| Indian | 5 (1.5) | 5 (3.2) | 6.4[+] | 0 (0) | 0.4[+] |
| Pakistani | 2 (0.6) | 2 (1.3) | 2.2[+] | 0 (0) | 0.5[+] |
| Bangladeshi | 0 (0) | 0 (0) | 0.5[+] | 0 (0) | 0[+] |
| Chinese | 0 (0) | 0 (0) | 1.5[+] | 0 (0) | 0.3[+] |
| Asian other | 1 (0.3) | 1 (0.6) | 2.1[+] | 0 (0) | 0.1[+] |
| Mixed parentage | 6 (1.8) | 2 (1.3) | 3.7[+] | 4 (2.2) | 0.6[+] |
| Not known | 3 (0.9) | 1 (0.6) | 0[+] | 2 (1.1) | 0[+] |
| **Marital status** | | | | | |
| Single | 58 (17.3) | 32 (20.5) | 35.6* | 26 (14.5) | 25.8* |
| Married / cohabiting | 232 (69.3) | 103 (66.0) | 49.4* | 129 (72.1) | 56.1* |
| Divorced | 14 (4.2) | 9 (5.8) | 8.0* | 5 (2.8) | 9.3* |
| Widowed | 26 (7.8) | 11 (7.1) | 7.0* | 15 (8.4) | 8.8* |
| Not known | 5 (1.5) | 1 (0.6) | 0* | 4 (2.2) | 0* |

*Aged 16 and over (Office for National Statistics, 2003)

[+]All people (Office for National Statistics, 2003)

**Table C14     Phase 2 main pilot sample by occupational group**

| Occupational group | Sample | Croydon sample n=156 (%) | Croydon (%, 2001 Census*) | Doncaster sample n=179 (%) | Doncaster (%, 2001 Census*) |
|---|---|---|---|---|---|
| Managers & senior officials | 21 (6.3) | 9 (5.8) | 10.2 | 12 (6.7) | 6.6 |
| Professional | 16 (4.8) | 5 (3.2) | 7.9 | 11 (6.1) | 4.2 |
| Associate prof. & technical | 27 (8.1) | 16 (10.3) | 10.0 | 11 (6.1) | 6.3 |
| Administrative & secretarial | 27 (8.1) | 15 (9.6) | 11.3 | 12 (6.7) | 6.2 |
| Skilled trades | 22 (6.6) | 10 (6.4) | 5.9 | 12 (6.7) | 7.4 |
| Personal service | 23 (6.9) | 12 (7.8) | 4.3 | 11 (6.1) | 4.6 |
| Sales and customer service | 11 (3.3) | 5 (3.2) | 5.2 | 6 (3.4) | 5.5 |
| Process, plant & machine operatives | 10 (3.0) | 3 (1.9) | 3.4 | 7 (3.9) | 6.6 |
| Elementary | 12 (3.6) | 5 (3.2) | 5.4 | 7 (3.9) | 8.6 |
| Employed – other | 30 (9.0) | 18 (11.5) | 0 | 12 (6.7) | 0 |
| Student | 13 (3.9) | 9 (5.8) | 7.1 | 4 (2.2) | 4.8 |
| Unemployed | 12 (3.6) | 9 (5.8) | 3.8 | 3 (1.7) | 4.2 |
| Unable to work due to disability | 13 (3.9) | 6 (3.8) | 3.8 | 7 (3.9) | 8.4 |
| Retired | 76 (22.7) | 26 (16.7) | 11.1 | 50 (27.9) | 15.2 |
| Household duties | 19 (5.7) | 8 (5.1) | 7.1 | 11 (6.1) | 7.6 |
| Not known | 3 (0.9) | 0 (0) | 3.5 | 3 (1.7) | 3.8 |
| Total | 335 | 156 | | 179 | |

*Aged 16 and over (Office for National Statistics, 2003)

**Table C15    Number of passages relating to RG-UK items**

| Items | Discussion about its relevance | Discussion about its irrelevance | Other discussion |
|---|---|---|---|
| 1.1 …can repair a car, bike, etc. | 11 | 7 | 2 |
| 1.2 …owns a car | 6 | 6 | 0 |
| 1.3 …is handy repairing household equipment | 9 | 2 | 0 |
| 1.4 …can speak and write a foreign language | 7 | 6 | 1 |
| 1.5 …can work with a PC | 5 | 2 | 1 |
| 1.6 …can play an instrument | 2 | 6 | 1 |
| 1.7 …has knowledge of literature | 4 | 5 | 0 |
| 1.8 …has A levels | 3 | 14 | 5 |
| 1.9 …has a higher vocational training | 6 | 6 | 5 |
| 1.10 …reads a professional journal | 3 | 4 | 3 |
| 1.11 …is active in a political party | 3 | 9 | 1 |
| 1.12 …owns shares worth at least £3,000 | 3 | 9 | 8 |
| 1.13 …works at the town hall | 3 | 6 | 3 |
| 1.14 …earns more than £1,500 monthly | 8 | 5 | 8 |
| 1.15 …owns a holiday home abroad | 9 | 2 | 1 |
| 1.16 …can sometimes hire people | 7 | 1 | 0 |
| 1.17 …knows a lot about governmental regulations | 7 | 2 | 0 |
| 1.18 …has good contacts with a newspaper etc | 9 | 2 | 0 |
| 1.19 …knows about soccer | 4 | 7 | 15 |
| 1.20 …has knowledge about financial matters | 13 | 0 | 0 |
| 2.1 … could find a holiday job for a family member | 2 | 6 | 0 |
| 2.2 … could give advice on conflicts at work | 7 | 5 | 3 |
| 2.3 … could help when moving house | 5 | 1 | 0 |
| 2.4 … could help with small jobs around the house | 9 | 1 | 1 |
| 2.5 … could do your shopping when you are ill | 3 | 2 | 0 |
| 2.6 … could give a medical second opinion | 4 | 3 | 3 |
| 2.7 … could lend you a large sum of money | 1 | 10 | 3 |
| 2.8 … could provide a place to stay temporarily | 5 | 3 | 1 |
| 2.9 … could give advice about family conflicts | 7 | 4 | 1 |
| 2.10 … could discuss with you what political party | 5 | 8 | 2 |
| 2.11 … could give advice on matters of law | 5 | 2 | 5 |
| 2.12 … could give a good reference | 9 | 4 | 0 |
| 2.13 … could baby-sit your children | 4 | 7 | 2 |
| 2.14 … could discuss important matters with you | 14 | 0 | 1 |
| 2.15 … you could visit socially | 14 | 1 | 3 |

**Table C16      Focus group participants' item relevance rating for RG-UK**

| Items | Mean | Median |
|---|---|---|
| 1.1 …can repair a car, bike, etc. | 3.0 | 4 |
| 1.2 …owns a car | 2.9 | 2 |
| 1.3 …is handy repairing household equipment | 3.6 | 4 |
| 1.4 …can speak and write a foreign language | 2.5 | 2 |
| 1.5 …can work with a PC | 3.0 | 3.5 |
| 1.6 …can play an instrument | 2.4 | 2 |
| 1.7 …has knowledge of literature | 2.3 | 2 |
| 1.8 …has A levels | 2.1 | 1 |
| 1.9 …has a higher vocational training | 2.6 | 3 |
| 1.10 …reads a professional journal | 2.4 | 2.5 |
| 1.11 …is active in a political party | 2.0 | 1 |
| 1.12 …owns shares worth at least £3,000 | 2.0 | 1 |
| 1.13 …works at the town hall | 2.6 | 2.5 |
| 1.14 …earns more than £1,500 monthly | 3.0 | 3 |
| 1.15 …owns a holiday home abroad | 3.3 | 4 |
| 1.16 …can sometimes hire people | 2.8 | 3 |
| 1.17 …knows a lot about governmental regulations | 3.4 | 4 |
| 1.18 …has good contacts with a newspaper etc | 3.0 | 2.5 |
| 1.19 …knows about soccer | 2.2 | 1 |
| 1.20 …has knowledge about financial matters | 4.0 | 4.5 |
| 2.1 … could find a holiday job for a family member | 2.2 | 2 |
| 2.2 … could give advice on conflicts at work | 3.0 | 4 |
| 2.3 … could help when moving house | 3.6 | 4 |
| 2.4 … could help with small jobs around the house | 3.7 | 4 |
| 2.5 … could do your shopping when you are ill | 2.9 | 3 |
| 2.6 … could give a medical second opinion | 2.9 | 3 |
| 2.7 … could lend you a large sum of money | 2.3 | 2 |
| 2.8 … could provide a place to stay temporarily | 3.1 | 3 |
| 2.9  … could give advice about conflicts with family members | 3.0 | 3.5 |
| 2.10 … could discuss with you what political party to vote for | 2.1 | 1 |
| 2.11 … could give advice on matters of law | 3.4 | 4 |
| 2.12 … could give a good reference when applying for a job | 3.3 | 4 |
| 2.13 … could baby-sit your children | 2.3 | 1 |
| 2.14 … could discuss important matters with you | 4.6 | 5 |
| 2.15 … you could visit socially | 4.4 | 5 |

**Table C17    Suggested new items for RG-UK**

| Item | Number of times suggested |
|---|---|
| … is a plumber | 3 |
| … is an electrician | 2 |
| … is a decorator | 2 |
| … is a gardener | 2 |
| … someone to go out with | 2 |
| … has time to volunteer their skills | 1 |
| … someone who can repair computers | 1 |
| … is knowledgeable about alternative medicine | 1 |
| … is knowledgeable about child psychology | 1 |
| … someone who can sew | 1 |
| … someone to share your hobbies or interests with | 1 |
| … has a good general knowledge | 1 |
| … is a teacher | 1 |
| … is a locksmith | 1 |

**Table C18    RG-UK α1 and α2 items**

| Original item in RG-UK α1 (n=35) | New items in RG-UK α2 (n=38) |
|---|---|
| can repair a car, bike, etc. | can repair a car |
| owns a car | *Unchanged* |
| is handy repairing household equipment | is a reliable plumber |
| can speak and write a foreign language | is fluent in another language |
| can work with a PC | can repair computers |
| can play an instrument | can play a musical instrument |
| has knowledge of literature | has a good knowledge of literature |
| has A levels | has a higher degree (eg MA, PhD) |
| has a higher vocational training | *Discarded* |
|  | is good at gardening |
| reads a professional journal | has a professional occupation |
| is active in a political party | is a local councillor |
| owns shares worth at least £3,000 | successfully trades shares |
| works at the town hall | works for the local council |
| earns more than £1,500 monthly | owns a successful business |
| owns a holiday home abroad | *Unchanged* |
| can sometimes hire people | can sometimes employ people |
| knows a lot about governmental regulations | knows a lot about government regulations |
| has good contacts with a newspaper, radio or t.v. station | has good contacts with the media |
|  | has time to help other people |
|  | grows a lot of their own food |
|  | knows a lot about alternative medicine |
|  | is good at sewing |
| knows about soccer | *Discarded* |

| Original item in RG-UK α1 (n=35) | New items in RG-UK α2 (n=38) |
|---|---|
| has knowledge about financial matters (e.g. taxes, subsidies) | could give you good financial advice |
| could find a holiday job for a family member | *Discarded* |
| could give advice on conflicts at work | *Unchanged* |
| could help when moving house (packing, lifting) | could help you to move house |
| could help with small jobs around the house (carpentry, painting) | could help with small jobs around the house |
| could do your shopping when you (and your household members) are ill | could do your shopping when you are ill |
| could give a medical second opinion | could give you medical advice |
| could lend you a large sum of money (e.g. £3,000) | could lend you a large sum of money (e.g. £5,000) |
| could provide a place to stay for a week if you have to leave your home temporarily | *Discarded* |
| could give advice about conflicts with family members | *Discarded* |
|  | could give you careers advice |
|  | could provide support if you suffer a bereavement |
| could discuss with you what political party to vote for | could discuss politics with you |
| could give advice on matters of law (e.g. problems with the landlord, boss, municipality) | could give you legal advice |
| could give a good reference when applying for a job | could give you a good reference for a job |
| could baby-sit your children | *Unchanged* |
| could discuss important matters with you | you could confide in |
| you could visit socially | you could go out socially with (eg to the cinema) |
|  | could provide support if you were a victim of crime |

**Table C19      RG-UK α1 item popularities q.1 (focus group participants)**

| 1. (a) Do you know anyone who … ?<br><br>(b) Are you someone who … ? | Yes<br>n (%) | No<br>n (%) | Missing<br>n (%) | You?<br>n (%) |
|---|---|---|---|---|
| 1 …can repair a car, bike, etc. | 16 (72.7) | 4 (18.2) | 2 (9.1) | 5 (22.7) |
| 2 …owns a car | 16 (72.7) | 1 (4.5) | 5 (22.7) | 15 (68.2) |
| 3 …is handy repairing household equipment | 20 (90.9) | 0 | 2 (9.1) | 7 (31.8) |
| 4 …can speak and write a foreign language | 16 (72.7) | 3 (13.6) | 3 (13.6) | 8 (36.4) |
| 5 …can work with a PC | 19 (86.4) | 0 | 3 (13.6) | 18 (81.8) |
| 6 …can play an instrument | 17 (77.3) | 2 (9.1) | 3 (13.6) | 7 (31.8) |
| 7 …has knowledge of literature | 19 (86.4) | 1 (4.5) | 2 (9.1) | 13 (59.1) |
| 8 …has A levels | 19 (86.4) | 0 | 3 (13.6) | 12 (54.5) |
| 9 …has a higher vocational training | 19 (86.4) | 0 | 3 (13.6) | 8 (36.4) |
| 10 …reads a professional journal | 14 (63.6) | 4 (18.2) | 4 (18.2) | 8 (36.4) |
| 11 …is active in a political party | 8 (36.4) | 10 (45.5) | 4 (18.2) | 2 (9.1) |
| 12 …owns shares worth at least £3,000 | 16 (72.7) | 4 (18.2) | 2 (9.1) | 8 (36.4) |
| 13 …works at the town hall | 8 (36.4) | 11 (50.0) | 3 (13.6) | 0 |
| 14 …earns more than £1,500 monthly | 20 (90.9) | 1 (4.5) | 1 (4.5) | 2 (9.1) |
| 15 …owns a holiday home abroad | 17 (77.3) | 5 (22.7) | 0 | 3 (13.6) |
| 16 …can sometimes hire people | 14 (63.6) | 6 (27.3) | 2 (9.1) | 3 (13.6) |
| 17 …knows a lot about gov. regulations | 17 (77.3) | 4 (18.2) | 1 (4.5) | 4 (18.2) |
| 18 …has good contacts with a newspaper | 13 (59.1) | 5 (22.7) | 4 (18.2) | 6 (27.3) |
| 19 …knows about soccer | 20 (90.9) | 2 (9.1) | 0 | 7 (31.8) |
| 20 …has knowledge about financial matters | 19 (86.4) | 1 (4.5) | 2 (9.1) | 7 (31.8) |

**Table C20      RG-UK α1 item popularities q.2 (focus group participants)**

| 2. Do you know anyone who  … ? | Yes?<br>(%) | No<br>n (%) | Missing<br>n (%) |
|---|---|---|---|
| 1 … could find a holiday job… | 7 (31.8) | 15 (68.2) | 0 |
| 2 … could give advice on conflicts at work | 17 (77.3) | 4 (18.2) | 1 (4.5) |
| 3 … could help when moving house | 21 (95.5) | 1 (4.5) | 0 |
| 4 … could help with small jobs… | 21 (95.5) | 1 (4.5) | 0 |
| 5 … could do your shopping… | 22 (100) | 0 | 0 |
| 6 … could give a medical second opinion | 13 (59.1) | 8 (36.4) | 1 (4.5) |
| 7 … could lend you a large sum of money | 16 (72.7) | 6 (27.3) | 0 |
| 8 … could provide a place to stay… | 21 (95.5) | 1 (4.5) | 0 |
| 9  … could give advice about conflicts… | 20 (90.9) | 2 (9.1) | 0 |
| 10 … could discuss with you political party… | 18 (81.8) | 2 (9.1) | 2 (9.1) |
| 11 … could give advice on matters of law | 19 (86.4) | 2 (9.1) | 1 (4.5) |
| 12 … could give a good reference… | 22 (100) | 0 | 0 |
| 13 … could baby-sit your children | 15 (68.2) | 5 (22.7) | 2 (9.1) |
| 14 … could discuss important matters… | 22 (100) | 0 | 0 |
| 15 … you could visit socially | 22 (100) | 0 | 0 |

**Table C21**      **Number of discussions about problematic occupations**

| Occupation | Discussions (n) |
|---|---|
| Fishmonger | 4 |
| Countryside warden | 4 |
| Postman / woman | 3 |
| Community worker | 2 |
| Market trader | 2 |
| Post office clerk | 2 |
| Administrator | 2 |
| Machine operator | 2 |
| Construction worker | 2 |
| Security guard | 2 |
| Laboratory technician | 2 |
| Member of Parliament | 1 |
| Travel agent | 1 |
| Childminder | 1 |
| Academic researcher | 1 |
| Care assistant | 1 |
| Call centre operator | 1 |
| Taxi driver | 1 |
| Member of armed forces | 1 |
| Librarian | 1 |
| School teacher | 1 |

**Table C22**     **Occupations suggested for inclusion in PG-UK (focus groups)**

| Occupation | Times suggested (n) |
| --- | --- |
| Police officer | 3 |
| Solicitor | 3 |
| Accountant | 2 |
| Civil servant | 2 |
| Butcher | 2 |
| Dentist | 1 |
| Fire fighter | 1 |
| Paramedic | 1 |
| Clergyman/woman | 1 |
| Celebrity | 1 |
| Nurse | 1 |
| Lifestyle coach | 1 |
| Farmer | 1 |
| Careers advisor | 1 |
| Financial advisor | 1 |
| Tax collector | 1 |
| Professional sportsperson | 1 |
| Architect | 1 |
| Coal man | 1 |
| Wagon driver | 1 |
| Publican | 1 |
| Restauranteur | 1 |
| Baker | 1 |
| Supermarket manager | 1 |
| Delivery driver | 1 |

**Table C23      Changes to PG-UK α1**

| Original item in PG-UK α1 (n=34) | New items in PG-UK α2 (n=32) |
|---|---|
| Artist | *Unchanged* |
| Sales assistant | *Unchanged* |
| Machine operator | Factory worker |
| Gardener | *Unchanged* |
| Laboratory technician | *Discarded* |
| Postman / woman | Postal worker |
| Member of Parliament | *Unchanged* |
| Administrator | Secretary |
| Academic researcher | *Discarded* |
| Estate agent | *Unchanged* |
| Scientist | *Unchanged* |
| Travel agent | *Unchanged* |
| Countryside warden | Farmer |
| Electrician | *Unchanged* |
| Call centre operator | *Discarded* |
| Care assistant | *Discarded* |
| Labourer | *Unchanged* |
| Fishmonger | Butcher |
| Member of armed forces | *Unchanged* |
| Security guard | Police officer |
| Market trader | Street trader |
| Doctor | *Unchanged* |
| Taxi driver | *Unchanged* |
| Community worker | *Discarded* |
| Construction worker | Builder |
| Post office clerk | *Discarded* |
| Shopkeeper | *Discarded* |
| School teacher | *Unchanged* |
| Bank Manager | *Unchanged* |
| Childminder | *Unchanged* |
| Plumber | *Discarded* |
| Receptionist | *Discarded* |
| Mechanic | *Discarded* |
| Librarian | *Unchanged* |
|  | Solicitor |
|  | Religious leader |
|  | Journalist |
|  | Civil servant |
|  | Accountant |
|  | Nurse |
|  | Publican |
|  | Undertaker |

**Table C24    Expert panel suggestions for new items for the RG-UK**

| Item no. | Item |
|----------|------|
| A23 | Knows a lot about DIY |
| B17 | Get you cheap goods or 'bargains' |
| B18 | Help you to find somewhere to live if you had to move home |
| B19 | Lend you a small amount of money (e.g. for a local taxi fare) |
| B20 | Look after your home or pets if you go away |
| B21 | Provide practical help in the event of a personal crisis (e.g. bereavement) |
| B22 | Can help you with DIY |

**Table C25    Amendments to PG-UK following expert panel**

| Original item in PG-UK α2 (n=32) | New items in PG-UK α3 (n=30) |
|----------------------------------|------------------------------|
| Artist | *Unchanged* |
| Sales assistant | *Unchanged* |
| Factory worker | *Unchanged* |
| Gardener | *Unchanged* |
| Postal worker | *Unchanged* |
| Member of Parliament | *Unchanged* |
| Secretary | *Unchanged* |
| Estate agent | *Unchanged* |
| Scientist | University Professor |
| Travel agent | *Unchanged* |
| Electrician | Call centre operator |
| Labourer | Window cleaner |
| Farmer | Small farmer |
| Solicitor | *Unchanged* |
| Religious leader | *Added:* (e.g. priest, mullah) |
| Journalist | *Unchanged* |
| Butcher | *Unchanged* |
| Member of armed forces | *Discarded* |
| Police officer | Police constable |
| Street trader | *Unchanged* |
| Doctor | *Added:* (of medicine) |
| Taxi driver | *Unchanged* |
| Civil servant | *Discarded* |
| School teacher | *Unchanged* |
| Bank Manager | Judge |
| Childminder | *Unchanged* |
| Librarian | *Unchanged* |
| Accountant | *Unchanged* |
| Builder | *Unchanged* |
| Nurse | *Unchanged* |
| Publican | *Unchanged* |
| Undertaker | *Unchanged* |

**Table C26      Pilot 1 RG-UK item endorsement frequencies and missing data**

| Item (RG-UK α5) | 'Yes' (%) | Missing (%) |
|---|---|---|
| A2 - owns a car | 285 (96.6) | 2 (0.7) |
| B13 - go out socially with you | 273 (92.5) | 4 (1.4) |
| B18 - provide practical help in the event of a personal crisis | 271 (91.9) | 2 (0.7) |
| B5 - do your shopping if you are ill | 265 (89.8) | 0 (0.0) |
| B7 - lend you a small amount of money | 265 (89.8) | 1 (0.3) |
| A7 - has a professional occupation | 256 (86.8) | 2 (0.7) |
| B4 - help you with small jobs around the house | 255 (86.4) | 5 (1.7) |
| A17 - knows a lot about DIY | 245 (83.1) | 2 (0.7) |
| B17 - look after your home or pets if you go away | 244 (82.7) | 9 (3.1) |
| A6 - is good at gardening | 243 (82.4) | 2 (0.7) |
| B11 - give you a good reference for a job | 240 (81.4) | 10 (3.4) |
| B3 - help you to move or dispose of bulky items | 236 (80.0) | 1 (0.3) |
| A14 - has time to help other people | 230 (78.0) | 4 (1.4) |
| A5 - knows how to fix problems with computers | 224 (75.9) | 1 (0.3) |
| A3 - is a reliable tradesman | 218 (73.9) | 7 (2.4) |
| A16 - is good at sewing | 210 (71.2) | 3 (1.0) |
| A1 - can repair a broken-down car | 208 (70.5) | 3 (1.0) |
| B1 - give you sound advice about money problems | 201 (68.1) | 1 (0.3) |
| B6 - give you sound medical advice | 199 (67.5) | 1 (0.3) |
| B2 - give you sound advice on problems at work | 191 (64.7) | 13 (4.4) |
| B15 - help you to find somewhere to live if you had to move home | 188 (63.7) | 4 (1.4) |
| A15 - knows a lot about health and fitness | 187 (63.4) | 4 (1.4) |
| A4 - can speak another language | 173 (58.6) | 5 (1.7) |
| B9 - discuss politics with you | 168 (56.9) | 4 (1.4) |
| A10 - has a place where you can go for an enjoyable break | 164 (55.6) | 1 (0.3) |
| A11 - can sometimes employ people | 160 (54.2) | 3 (1.0) |
| B10 - give you sound legal advice | 157 (53.2) | 3 (1.0) |
| B14 - get you cheap goods or 'bargains' | 155 (52.5) | 3 (1.0) |
| B12 - baby-sit your children (if you have any) | 147 (49.8) | 51 (17.3) |
| B8 - give you careers advice | 135 (45.8) | 12 (4.1) |
| B16 - lend you a large amount of money | 131 (44.4) | 3 (1.0) |
| A9 - works for the local council | 126 (42.7) | 1 (0.3) |
| A12 - knows a lot about government regulations | 120 (40.7) | 3 (1.0) |
| A8 - is a local councillor | 70 (23.7) | 1 (0.3) |
| A13 - has good contacts with the local newspaper, radio or t.v. | 51 (17.3) | 1 (0.3) |

**Table C27**      **Pilot 1 missing data univariate analyses**

| Variable | Full data n=208(%) | At least one item missing n=87 (%) | $\chi^2$ or $t$ | df | p | Mean difference (95% CI) |
|---|---|---|---|---|---|---|
| **Sex** | | | | | | |
| Male | 92 (44.2) | 28 (32.2) | | | | |
| Female | 116 (55.8) | 59 (67.8) | 3.69 | 1 | 0.055 | N/A |
| **Age** | | | | | | |
| Mean (s.d.) | 44.7 (15.1) | 49.4 (18.6) | 2.04 | 131.8 | 0.044 | 4.64 |
| | | | | | | (0.13-9.15) |
| **Ethnicity** | | | | | | |
| White | 183 (88.0) | 63 (72.4) | | | | |
| Black | 12 (5.8) | 15 (17.2) | | | | |
| Asian | 8 (3.8) | 7 (8.0) | | | | |
| Mixed | 5 (2.4) | 2 (2.3) | 12.73 | 3 | 0.005 | N/A |
| **Marital status*** | | | | | | |
| Single | 47 (22.7) | 22 (25.3) | | | | |
| Married | 135 (65.2) | 49 (56.3) | | | | |
| Divorced | 15 (7.2) | 10 (11.5) | | | | |
| Widowed | 10 (4.8) | 6 (6.9) | 2.73 | 3 | 0.435 | N/A |
| **Employment status** | | | | | | |
| Employed | 142 (68.3) | 45 (51.7) | | | | |
| Not employed | 66 (31.7) | 42 (48.3) | 7.24 | 1 | 0.007 | N/A |
| **Borough** | | | | | | |
| Croydon | 97 (46.6) | 43 (49.4) | | | | |
| Doncaster | 111 (53.4) | 44 (50.6) | 0.19 | 1 | 0.66 | N/A |

*Missing value excluded from analysis

**Table C28       Pilot 1 access to RG-UK resources via a professional only**

| Item (RG-UK α5) | Professional only (% of 'yes') |
| --- | --- |
| B6 - give you sound medical advice | 83 (41.7) |
| B10 - give you sound legal advice | 49 (31.2) |
| A1 - can repair a broken-down car | 48 (23.1) |
| B1 - give you sound advice about money problems | 41 (20.4) |
| A3 - is a reliable tradesman | 38 (17.4) |
| B8 - give you careers advice | 10 (7.4) |
| A5 - knows how to fix problems with computers | 16 (7.1) |
| A8 - is a local councillor | 5 (7.1) |
| B16 - lend you a large amount of money | 14 (6.3) |
| A15 - knows a lot about health and fitness | 10 (5.3) |
| B15 - help you to find somewhere to live if you had to move home | 10 (5.3) |
| B11 - give you a good reference for a job | 15 (5.1) |
| B2 - give you sound advice on problems at work | 8 (4.2) |
| A12 - knows a lot about government regulations | 5 (4.2) |
| A13 - has good contacts with the local newspaper, radio or t.v. | 2 (3.9) |
| A6 - is good at gardening | 9 (3.7) |
| A9 - works for the local council | 4 (3.2) |
| A7 - has a professional occupation | 7 (2.7) |
| B4 - help you with small jobs around the house | 5 (2.0) |
| A11 - can sometimes employ people | 3 (1.9) |
| A10 - has a place where you can go for an enjoyable break | 3 (1.8) |
| A2 - owns a car | 4 (1.4) |
| A16 - is good at sewing | 3 (1.4) |
| B3 - help you to move or dispose of bulky items | 3 (1.3) |
| B17 - look after your home or pets if you go away | 3 (1.2) |
| B9 - discuss politics with you | 2 (1.2) |
| B5 - do your shopping if you are ill | 3 (1.1) |
| B18 - provide practical help in the event of a personal crisis | 2 (0.7) |
| A4 - can speak another language | 1 (0.6) |
| B14 - get you cheap goods or 'bargains' | 1 (0.6) |
| A14 - has time to help other people | 1 (0.4) |
| A17 - knows a lot about DIY | 1 (0.4) |
| B7 - lend you a small amount of money | 1 (0.4) |
| B13 - go out socially with you | 1 (0.4) |
| B12 - baby-sit your children (if you have any) | 0 (0.0) |

**Table C29    Exploratory scaling in MSP of RG-UK α5 with lowerbound $H_i$ = 0.4**

| Scale 1 | Mean | $H_i$ |
|---|---|---|
| A7 - has a professional occupation | 0.88 | 0.49 |
| A8 - is a local councillor | 0.25 | 0.40 |
| A12 - knows a lot about government regulations | 0.41 | 0.60 |
| A13 - has good contacts with the local newspaper, radio or t.v. | 0.18 | 0.43 |
| A14 - has time to help other people | 0.78 | 0.41 |
| A15 - knows a lot about health and fitness | 0.64 | 0.41 |
| B1 - give you sound advice about money problems | 0.69 | 0.45 |
| B2 - give you sound advice on problems at work | 0.69 | 0.53 |
| B5 - do your shopping if you are ill | 0.91 | 0.38 |
| B7 - lend you a small amount of money | 0.90 | 0.43 |
| B8 - give you careers advice | 0.49 | 0.51 |
| B9 - discuss politics with you | 0.58 | 0.49 |
| B10 - give you sound legal advice | 0.55 | 0.48 |
| B11 - give you a good reference for a job | 0.84 | 0.53 |
| n=239, *H*=0.47, *ρ*=0.85 | | |

| Scale 2 | Mean | $H_i$ |
|---|---|---|
| A17 - knows a lot about DIY | 0.86 | 0.42 |
| B3 - help you to move or dispose of bulky items | 0.80 | 0.48 |
| B4 - help you with small jobs around the house | 0.90 | 0.63 |
| B14 - get you cheap goods or 'bargains' | 0.53 | 0.54 |
| B15 - help you to find somewhere to live if you had to move home | 0.66 | 0.55 |
| B16 - lend you a large amount of money | 0.48 | 0.58 |
| B17 - look after your home or pets if you go away | 0.87 | 0.56 |
| n=239, *H*=0.54, *ρ*=0.78 | | |

| Scale 3 | Mean | $H_i$ |
|---|---|---|
| A5 - knows how to fix problems with computers | 0.79 | 0.46 |
| A9 - works for the local council | 0.43 | 0.53 |
| A16 - is good at sewing | 0.73 | 0.43 |
| n=239, *H*=0.47, *ρ*=0.56 | | |

| Scale 4 | Mean | $H_i$ |
|---|---|---|
| A1 - can repair a broken-down car | 0.71 | 0.48 |
| A3 - is a reliable tradesman | 0.76 | 0.48 |
| n=239, *H*=0.48, *ρ*=0.59 | | |

| Scale 5 | Mean | $H_i$ |
|---|---|---|
| A6 - is good at gardening | 0.84 | 0.41 |
| A11 - can sometimes employ people | 0.56 | 0.41 |
| n=239, *H*=0.41, *ρ*=0.38 | | |

**Table C30      Inter-item correlations of RG-UK α5 items**

| Item | Scale 1: Domestic resources | | | | | | | Scale 2: Expert advice | | | | | | | | | Scale 3: Personal skills | | | | | | Scale 4: Prob. solv. resources | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | B16 | B14 | B15 | B3 | A17 | B17 | B4 | A13 | A12 | B8 | B10 | B9 | B1 | B2 | B11 | A7 | A9 | A11 | A15 | A1 | A3 | A6 | A8 | A4 | A5 | B5 | B7 |
| **Scale 1** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B16 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B14 | **0.37** | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| B15 | **0.44** | **0.39** | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| B3 | **0.28** | **0.27** | **0.36** | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| A17 | **0.24** | **0.20** | **0.23** | **0.23** | 1 | | | | | | | | | | | | | | | | | | | | | | |
| B17 | **0.34** | **0.30** | **0.35** | **0.29** | **0.28** | 1 | | | | | | | | | | | | | | | | | | | | | |
| B4 | **0.26** | **0.33** | **0.29** | **0.31** | **0.45** | **0.42** | 1 | | | | | | | | | | | | | | | | | | | | |
| **Scale 2** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A13 | ns | ns | 0.13 | ns | ns | ns | ns | 1 | | | | | | | | | | | | | | | | | | | |
| A12 | **0.32** | **0.22** | **0.28** | **0.17** | **0.22** | 0.12 | 0.12 | **0.25** | 1 | | | | | | | | | | | | | | | | | | |
| B8 | **0.28** | **0.23** | **0.32** | **0.23** | **0.22** | **0.21** | **0.16** | **0.17** | **0.32** | 1 | | | | | | | | | | | | | | | | | |
| B10 | **0.27** | **0.26** | **0.26** | **0.24** | **0.21** | 0.13 | ns | **0.21** | **0.42** | **0.31** | 1 | | | | | | | | | | | | | | | | |
| B9 | **0.29** | **0.21** | **0.33** | **0.17** | ns | **0.16** | ns | **0.16** | **0.42** | **0.45** | **0.44** | 1 | | | | | | | | | | | | | | | |
| B1 | **0.32** | **0.23** | **0.33** | **0.24** | **0.26** | **0.17** | **0.17** | **0.16** | **0.37** | **0.33** | **0.35** | **0.32** | 1 | | | | | | | | | | | | | | |
| B2 | **0.34** | **0.34** | **0.34** | **0.33** | **0.23** | **0.29** | **0.17** | 0.12 | **0.40** | **0.54** | **0.36** | **0.36** | **0.50** | 1 | | | | | | | | | | | | | |
| B11 | **0.24** | **0.22** | **0.22** | **0.22** | **0.19** | **0.21** | **0.17** | ns | **0.27** | **0.40** | **0.27** | **0.31** | **0.21** | **0.45** | 1 | | | | | | | | | | | | |
| A7 | **0.24** | ns | **0.28** | ns | 0.15 | 0.15 | 0.12 | 0.12 | **0.27** | **0.26** | **0.22** | **0.28** | **0.26** | **0.35** | **0.42** | 1 | | | | | | | | | | | |
| **Scale 3** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A9 | **0.16** | **0.17** | ns | 0.13 | **0.18** | ns | 0.13 | **0.17** | **0.32** | 0.13 | **0.19** | **0.18** | ns | **0.21** | **0.17** | **0.16** | 1 | | | | | | | | | | |
| A11 | **0.26** | **0.26** | **0.24** | **0.26** | **0.25** | ns | **0.17** | 0.14 | **0.25** | **0.26** | **0.28** | **0.16** | **0.20** | **0.32** | **0.32** | **0.27** | **0.21** | 1 | | | | | | | | | |
| A15 | **0.19** | **0.18** | **0.22** | **0.28** | **0.22** | **0.18** | **0.15** | **0.21** | **0.40** | **0.35** | **0.27** | **0.29** | **0.23** | **0.31** | **0.22** | **0.34** | **0.22** | **0.33** | 1 | | | | | | | | |
| A1 | **0.17** | **0.21** | **0.20** | **0.22** | **0.29** | **0.17** | 0.15 | ns | **0.19** | **0.21** | **0.19** | **0.17** | 0.14 | 0.13 | **0.17** | 0.13 | 0.15 | **0.23** | **0.22** | 1 | | | | | | | |
| A3 | **0.21** | **0.19** | **0.23** | **0.31** | **0.34** | **0.16** | 0.15 | ns | 0.14 | **0.23** | **0.26** | **0.18** | **0.28** | **0.32** | **0.31** | **0.27** | **0.18** | **0.27** | **0.22** | **0.45** | 1 | | | | | | |
| A6 | **0.21** | **0.19** | **0.28** | **0.21** | **0.24** | **0.16** | **0.17** | ns | 0.13 | **0.19** | **0.15** | **0.18** | **0.18** | **0.19** | **0.24** | **0.27** | **0.21** | **0.23** | **0.37** | **0.23** | **0.31** | 1 | | | | | |
| **Scale 4** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A8 | **0.19** | **0.16** | **0.21** | ns | 0.14 | ns | ns | **0.21** | **0.33** | **0.18** | **0.19** | **0.23** | 0.14 | ns | ns | ns | **0.44** | **0.18** | **0.17** | 0.15 | 0.15 | **0.21** | 1 | | | | |
| A4 | 0.12 | ns | **0.18** | ns | **0.19** | ns | ns | 0.13 | **0.32** | **0.28** | **0.22** | **0.28** | **0.22** | **0.26** | **0.24** | **0.25** | **0.23** | **0.16** | **0.21** | ns | **0.17** | 0.13 | **0.24** | 1 | | | |
| A5 | 0.12 | ns | **0.18** | 0.15 | **0.22** | 0.12 | ns | ns | **0.24** | **0.25** | **0.19** | **0.16** | **0.27** | **0.28** | **0.17** | **0.22** | **0.25** | **0.23** | **0.19** | **0.31** | **0.34** | **0.21** | **0.16** | **0.29** | 1 | | |
| B5 | 0.12 | **0.22** | **0.22** | **0.26** | **0.29** | **0.43** | **0.41** | ns | **0.19** | 0.15 | 0.14 | ns | **0.21** | **0.17** | **0.23** | ns | 0.15 | ns | 0.15 | ns | **0.16** | **0.18** | ns | **0.16** | **0.16** | 1 | |
| B7 | **0.25** | **0.28** | **0.26** | 0.12 | **0.26** | **0.26** | **0.20** | ns | 0.14 | **0.25** | **0.15** | **0.22** | **0.14** | **0.24** | **0.27** | 0.15 | ns | ns | ns | 0.12 | 0.15 | 0.12 | 0.13 | **0.19** | **0.19** | **0.34** | 1 |

Pearson correlations: **p<0.01**, p<0.05

**Table C31**     **Phase 1 PG-UK α3 item endorsements, missing data & professional contacts**

| Do you know a / an…? | 'Yes' (%) n=295 | Missing (%) n=295 | Professional only (% of 'yes') |
|---|---|---|---|
| 22 … School teacher | 197 (66.8) | 4 (1.4) | 5 (2.5) |
| 2 … Sales assistant | 187 (63.4) | 8 (2.7) | 4 (2.1) |
| 26 … Builder | 180 (61.0) | 5 (1.7) | 14 (7.8) |
| 27 … Nurse | 172 (58.3) | 4 (1.4) | 7 (4.1) |
| 8 … Secretary | 159 (53.9) | 5 (1.7) | 6 (3.8) |
| 25 … Accountant | 146 (49.5) | 4 (1.4) | 18 (12.3) |
| 5 … Gardener | 138 (46.8) | 3 (1.0) | 11 (8.0) |
| 20 … Doctor (of medicine) | 133 (45.1) | 5 (1.7) | 45 (33.8) |
| 14 … Solicitor | 128 (43.4) | 4 (1.4) | 23 (18.0) |
| 23 … Childminder | 124 (42.0) | 3 (1.0) | 6 (4.8) |
| 18 … Police constable | 120 (40.7) | 4 (1.4) | 5 (4.2) |
| 6 … Postal worker | 115 (39.0) | 4 (1.4) | 6 (5.2) |
| 3 … Factory worker | 100 (33.9) | 4 (1.4) | 0 (0) |
| 1 … Artist | 97 (32.9) | 3 (1.0) | 3 (3.1) |
| 12 … Window cleaner | 97 (32.9) | 3 (1.0) | 16 (16.5) |
| 15 … Religious leader | 96 (32.5) | 4 (1.4) | 16 (16.7) |
| 21 … Taxi driver | 94 (31.9) | 3 (1.0) | 5 (5.3) |
| 9 … Travel agent | 86 (29.2) | 2 (0.7) | 7 (8.1) |
| 28 … Publican | 82 (27.8) | 8 (2.7) | 4 (4.9) |
| 17 … Butcher | 80 (27.1) | 3 (1.0) | 9 (11.3) |
| 13 … Small farmer | 72 (24.4) | 3 (1.0) | 1 (1.4) |
| 30 … Call centre operator | 70 (23.7) | 6 (2.0) | 0 (0) |
| 11 … Estate agent | 68 (23.1) | 4 (1.4) | 5 (7.4) |
| 24 … Librarian | 63 (21.4) | 5 (1.7) | 11 (17.5) |
| 10 … University professor | 61 (20.7) | 3 (1.0) | 9 (14.8) |
| 19 … Street trader | 34 (11.5) | 5 (1.7) | 2 (5.9) |
| 29 … Undertaker | 33 (11.2) | 5 (1.7) | 7 (21.2) |
| 16 … Journalist | 32 (10.8) | 3 (1.0) | 0 (0) |
| 4 … Judge | 29 (9.8) | 5 (1.7) | 2 (6.9) |
| 7 … Member of Parliament | 25 (8.5) | 4 (1.4) | 5 (20.0) |

**Table C32     Exploratory scaling in MSP with lowerbound $H_i$ = 0.3 (PG-UK α3)**

| Scale 1 | Mean | $H_i$ |
|---|---|---|
| 4 - judge | 0.10 | 0.34 |
| 6 - postal worker | 0.40 | 0.30 |
| 8 - secretary | 0.55 | 0.38 |
| 9 - travel agent | 0.30 | 0.34 |
| 11 - estate agent | 0.24 | 0.34 |
| 19 - street trader | 0.12 | 0.42 |
| 26 - builder | 0.62 | 0.42 |
| n=268, *H*=0.36, *ρ*=0.65 | | |
| **Scale 2** | **Mean** | **$H_i$** |
| 2 - sales assistant | 0.65 | 0.57 |
| 3 - factory worker | 0.35 | 0.41 |
| 30 - call centre operator | 0.24 | 0.38 |
| n=268, *H*=0.44, *ρ*=0.54 | | |
| **Scale 3** | **Mean** | **$H_i$** |
| 5 - gardener | 0.47 | 0.32 |
| 13 - small farmer | 0.24 | 0.41 |
| 17 - butcher | 0.27 | 0.40 |
| n=268, *H*=0.38, *ρ*=0.55 | | |

**Table C33        Inter-item correlations of PG-UK items**

| Occupation | E7 | E16 | E19 | E29 | E10 | E30 | E11 | E13 | E17 | E9 | E3 | E18 | E14 | E5 | E25 | E8 | E27 | E26 | E2 | E22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E7 - Member of Parliament | 1 | | | | | | | | | | | | | | | | | | | |
| E16 - Journalist | **0.17** | 1 | | | | | | | | | | | | | | | | | | |
| E19 - Street trader | ns | ns | 1 | | | | | | | | | | | | | | | | | |
| E29 - Undertaker | **0.24** | 0.12 | ns | 1 | | | | | | | | | | | | | | | | |
| E10 - University professor | **0.17** | **0.28** | ns | ns | 1 | | | | | | | | | | | | | | | |
| E30 - Call centre operator | ns | **0.16** | ns | **0.15** | ns | 1 | | | | | | | | | | | | | | |
| E11 - Estate agent | ns | ns | **0.15** | 0.13 | **0.16** | ns | 1 | | | | | | | | | | | | | |
| E13 - Small farmer | **0.17** | ns | ns | **0.20** | **0.16** | 0.14 | **0.15** | 1 | | | | | | | | | | | | |
| E17 - Butcher | ns | ns | **0.16** | 0.15 | ns | ns | ns | **0.43** | 1 | | | | | | | | | | | |
| E9 - Travel agent | **0.24** | ns | **0.26** | 0.13 | ns | ns | **0.25** | ns | ns | 1 | | | | | | | | | | |
| E3 - Factory worker | ns | ns | **0.24** | ns | ns | **0.20** | ns | **0.18** | **0.21** | **0.18** | 1 | | | | | | | | | |
| E18 - Police constable | **0.17** | ns | 0.13 | **0.16** | 0.12 | 0.12 | ns | **0.23** | **0.20** | **0.15** | 0.13 | 1 | | | | | | | | |
| E14 - Solicitor | **0.20** | **0.20** | ns | **0.19** | **0.25** | ns | **0.29** | **0.31** | **0.21** | **0.22** | ns | **0.26** | 1 | | | | | | | |
| E5 - Gardener | ns | ns | 0.15 | ns | ns | ns | **0.23** | **0.21** | **0.19** | 0.15 | ns | ns | 0.12 | 1 | | | | | | |
| E25 - Accountant | **0.18** | **0.20** | ns | 0.12 | **0.26** | 0.15 | **0.27** | **0.24** | 0.13 | **0.32** | ns | ns | **0.43** | ns | 1 | | | | | |
| E8 - Secretary | 0.13 | **0.17** | **0.18** | ns | **0.16** | **0.15** | **0.21** | **0.27** | 0.14 | **0.23** | ns | ns | **0.31** | 0.18 | 0.22 | 1 | | | | |
| E27 - Nurse | ns | ns | **0.18** | 0.12 | 0.12 | 0.14 | **0.18** | **0.16** | 0.12 | ns | 0.15 | 0.15 | **0.16** | ns | **0.21** | **0.20** | 1 | | | |
| E26 - Builder | ns | ns | **0.17** | 0.12 | ns | 0.14 | **0.26** | **0.22** | **0.16** | **0.24** | ns | 0.15 | **0.24** | **0.22** | **0.39** | **0.29** | **0.16** | 1 | | |
| E2 - Sales assistant | 0.12 | ns | ns | ns | ns | **0.22** | 0.13 | **0.17** | **0.22** | 0.13 | **0.31** | 0.12 | ns | **0.16** | 0.14 | 0.12 | ns | **0.26** | 1 | |
| E22 - School teacher | 0.13 | 0.13 | ns | ns | **0.24** | ns | **0.15** | **0.17** | ns | **0.15** | ns | **0.25** | **0.26** | ns | **0.21** | **0.20** | **0.28** | **0.20** | ns | 1 |

**Table C34    Pilot 2 RG-UK missing data univariate analysis**

| Variable | Full data n=277 (%) | At least one item missing n=58 (%) | $\chi^2$ or $t$ | df | p | Mean difference (95% CI) |
|---|---|---|---|---|---|---|
| **Sex** | | | | | | |
| Male | 121 (43.7) | 24 (41.4) | | | | |
| Female | 156 (56.3) | 34 (58.6) | 0.10 | 1 | 0.75 | N/A |
| **Age** | | | | | | |
| Mean (s.d.) | 46.6 (15.3) | 60.4 (16.5) | 5.91 | 303 | <0.001 | -13.8 (-18.3 to -9.2) |
| **Ethnicity*** | | | | | | |
| White | 241 (88.0) | 49 (84.5) | | | | |
| Black | 20 (7.3) | 8 (13.8) | | | | |
| Asian | 8 (2.9) | 0 (0) | | | | |
| Mixed | 5 (1.8) | 1 (1.7) | 4.16 | 3 | 0.25 | N/A |
| **Marital status*** | | | | | | |
| Single | 50 (18.3) | 8 (14.0) | | | | |
| Married | 195 (71.4) | 37 (64.9) | | | | |
| Divorced | 13 (4.76) | 1 (1.75) | | | | |
| Widowed | 15 (5.49) | 11 (19.3) | 13.19 | 3 | 0.004 | N/A |
| **Employment status*** | | | | | | |
| Employed | 177 (64.6) | 22 (37.93) | | | | |
| Not employed | 97 (35.4) | 36 (62.1) | 14.18 | 1 | <0.001 | N/A |
| **Borough** | | | | | | |
| Croydon | 125 (45.1) | 31 (53.5) | | | | |
| Doncaster | 152 (54.9) | 27 (46.4) | 1.33 | 1 | 0.25 | N/A |
| **Mailing** | | | | | | |
| First | 179 (64.6) | 41 (70.7) | | | | |
| Second | 87 (31.4) | 12 (20.7) | | | | |
| Third | 11 (4.0) | 5 (8.6) | 4.30 | 2 | 0.12 | N/A |
| **GHQ score** | | | | | | |
| Mean (s.d.) | 2.17 (3.09) | 1.75 (2.60) | 0.96 | 331 | 0.34 | 0.42 (-0.45 to 1.29) |

# Appendix D: SAFIRE study questionnaires

# SAFIRE baseline questionnaire

| The SAFIRE study |
| :---: |
| Questionnaire 1 |

Thank you for choosing to participate in the SAFIRE study. This is the first of two questionnaires we would like you to complete. The second will be sent to you in six months time.

Please answer all the questions and return it in the envelope provided as soon as possible. The ID number below will be used to anonymise your responses and to maintain your confidentiality. Your responses to this questionnaire will not be shared with any third parties. It should take you no longer than 30-40 minutes to complete.

Please write the date you fill this questionnaire in here:……………………………..

If you need any assistance in completing this questionnaire, or have any queries about it, please do not hesitate to contact the SAFIRE researcher:

Martin Webber,
Social Science Fellow,
PO32, Health Services Research Department,
Institute of Psychiatry,
De Crespigny Park,
London. SE5 8AF.

Tel.          020 7848 5096
e-mail :      m.webber@iop.kcl.ac.uk

**Thank you for participating in SAFIRE**

_____

Participant ID:

**BACKGROUND INFORMATION**
Please tick the box that most accurately describes you or write in the spaces on the line where indicated.

**1.** **Gender:** ☐ Male ☐ Female

**2.** **Date of Birth** ☐☐ ☐☐ ☐☐☐☐

**3.** **Marital status:** ☐ Single ☐ Divorced
☐ Married or cohabiting ☐ Widowed

**4.** **Ethnic origin:** ☐ White British ☐ Pakistani
☐ Black Caribbean ☐ Bangladeshi
☐ Black African ☐ Chinese
☐ Black Other ☐ Mixed parentage
☐ Indian ☐ Other –
(please specify):………………………

**5.** **Number of children under 16 at home:** ……………………..

**6.** **Employment status:** ☐ Employed or self employed (go to Q7)
(please tick one) ☐ Student (go to Q8)
☐ Unemployed (go to Q9)
☐ Retired (go to Q9)
☐ Looking after the home full-time (go to Q9)
☐ Carer (go to Q9)
☐ Unable to work due to disability or health problem (go to Q9)

**7.** **What is your occupation?**………………………………………………………(go to Q9)

**8.** **What are you studying?**……………………………………………………………

**9.** **Highest educational achievement:** ☐ No formal qualifications
(please tick one) ☐ CSE, GCSE, O Level, NVQ Level 2 or equivalent
☐ A Level, NVQ Level 3 or equivalent
☐ Degree (eg. BA, BSc)
☐ Postgraduate Degree (eg. MA, MSc, PhD)

**10.** **Type of residence:** ☐ House or flat (owned) ☐ Residential home
(please tick one) ☐ House or flat (rented) ☐ Sheltered housing
☐ Living with family ☐ Temporary accommodation
☐ Renting a room (lodging) ☐ Other –
(please specify):………………

**11.** **What is your total monthly household income after tax?** …………………………

**12.** **Have you suffered from depression before?** ☐ Yes (go to Q13)
☐ No (go to Q14)

**13.** **How many times have you suffered from depression before?** …………………………

**14.** **Has anyone in your family suffered from depression before?** ☐ Yes (go to Q15)
☐ No (go to Q18)

**15.** **What relation is this person to you?** ……………………………………………………

**16.** **When was he/she depressed?** ……………………………………………………

**17.** **Approximately how long was he/she depressed for?** …………………………………

**18.** **Approximately how long have you currently been depressed for?** ……………………..

**19.** **Are you currently receiving any treatment for depression?**  ☐ Yes (go to Q20)
☐ No (go to Q21)

**20.** **Please state below which treatment(s) you are receiving:**

**LIFE EVENTS**

**21.** **Have any of the following life events or problems happened to you <u>during the last six months</u>. Please tick either 'yes' or 'no'.**

(a) You suffered a serious illness, injury or an assault ☐ Yes
☐ No

(b) A serious illness, injury or assault happened to
a close relative ☐ Yes
☐ No

(c) Your parent, child or spouse died ☐ Yes
☐ No

(d) A close family friend or another relative (eg. Aunt,
cousin, grandparent) died ☐ Yes
☐ No

(e) You had a separation due to marital difficulties ☐ Yes
☐ No

(f) You broke off a steady relationship ☐ Yes
☐ No

(g) You had a serious problem with a close friend,
neighbour or relative ☐ Yes
☐ No

(h) You became unemployed or you were seeking work
unsuccessfully for more than one month ☐ Yes
☐ No

(i) You were sacked from your job ☐ Yes
☐ No

(j) You had a major financial crisis ☐ Yes
☐ No

(k) You had problems with the police and a court
appearance ☐ Yes
☐ No

(m) Something you valued was lost or stolen ☐ Yes
☐ No

**FRIENDS AND RELATIVES**

The following questions are about people in your life who you feel close to and from whom you can obtain support (either emotional or practical) including close relatives and good friends.

**22.** **How many people do you feel very close to?** …………………………
(It does not matter where they live or whether you have seen them recently)

If your answer is 0, please go to Q25.
If your answer is 1, please answer Q23 and then Q25 onwards.
If your answer is 2 or above, please answer Q23 onwards.

**23.** **Please answer the following questions about the person whom you have felt closest to in the last 12 months:**

(a) What is his/her relationship to you? …………………………………………….

(b) What is his/her gender? ☐ Male ☐ Female

(c) How far away does this person live?
(please tick one)
☐ With you
☐ Within walking distance
☐ Within half an hour's drive
☐ Between half an hour and one hour's drive
☐ More than one hour's drive
☐ Overseas

(d) We would like you to rate the practical and emotional support this person has provided for you in the last 12 months. Please tick one response for each question below:

| How much in the last 12 months … ? | Not at all | A little | Quite a lot | A great deal |
|---|---|---|---|---|
| (i) did this person give you information, suggestions and guidance that you found helpful? | | | | |
| (ii) could you rely on this person? Was this person there when you needed them? | | | | |
| (iii) did this person make you feel good about yourself? | | | | |
| (iv) did you share interests, hobbies and fun with this person? | | | | |
| (v) did this person give you worries, problems and stress? | | | | |
| (vi) did you want to confide in, talk frankly or share feelings with this person? | | | | |
| (vii) did you confide in this person? | | | | |
| (viii) did you trust this person with your most personal worries and problems? | | | | |

**23 (cont.)**

**How much in the last 12 months … ?**

| | Not at all | A little | Quite a lot | A great deal |
|---|---|---|---|---|
| (ix) would you have liked to have confided more in this person? | | | | |
| (x) did talking to this person make things worse? | | | | |
| (xi) did he/she talk about his/her personal worries with you? | | | | |
| (xii) did you need practical help from this person with major things, (e.g. looking after you when ill, help with finances or children)? | | | | |
| (xiii) did this person give you practical help with major things? | | | | |
| (xiv) would you have liked more practical help with major things from this person? | | | | |
| (xv) did this person give you practical help with small things when you needed it (e.g. chores, shopping, watering plants)? | | | | |

**24.** **Please answer the following questions about the person whom you have felt <u>next closest</u> to <u>in the last 12 months</u>:**

(a)     What is his/her relationship to you?     ……………………………………….

(b)     What is his/her gender?     ☐ Male          ☐ Female

(c)     How far away does this person live? (please tick one)
- ☐ With you
- ☐ Within walking distance
- ☐ Within half an hour's drive
- ☐ Between half an hour and one hour's drive
- ☐ More than one hour's drive
- ☐ Overseas

(d)     We would like you to rate the practical and emotional support this person has provided for you <u>in the last 12 months</u>. Please tick one response for each question below:

| How much in the last 12 months … ? | Not at all | A little | Quite a lot | A great deal |
|---|---|---|---|---|
| (i) did this person give you information, suggestions and guidance that you found helpful? | | | | |
| (ii) could you rely on this person? Was this person there when you needed them? | | | | |
| (iii) did this person make you feel good about yourself? | | | | |

**24 (cont.)**

**How much in the last 12 months … ?**

| | Not at all | A little | Quite a lot | A great deal |
|---|---|---|---|---|
| (iv) did you share interests, hobbies and fun with this person? | | | | |
| (v) did this person give you worries, problems and stress? | | | | |
| (vi) did you want to confide in, talk frankly or share feelings with this person? | | | | |
| (vii) did you confide in this person? | | | | |
| (viii) did you trust this person with your most personal worries and problems? | | | | |
| (ix) would you have liked to have confided more in this person? | | | | |
| (x) did talking to this person make things worse? | | | | |
| (xi) did he/she talk about his/her personal worries with you? | | | | |
| (xii) did you need practical help from this person with major things, (e.g. looking after you when ill, help with finances or children)? | | | | |
| (xiii) did this person give you practical help with major things? | | | | |
| (xiv) would you have liked more practical help with major things from this person? | | | | |
| (xv) did this person give you practical help with small things when you needed it (e.g. chores, shopping, watering plants)? | | | | |

**25.** Are there any relatives outside your household with whom you have regular contact, either by visit, telephone, letters or e-mail?

☐ Yes (go to Q26)
☐ No (go to Q27)

**26.** (a) How often do you have contact with any relatives outside your household? (please tick one)

☐ Almost daily
☐ About once a week
☐ About once a month
☐ Once every few months
☐ Never / almost never

**26.** (b) How often do you regularly visit or
are visited by these relatives?
(please tick one)

☐ Almost daily
☐ About once a week
☐ About once a month
☐ Once every few months
☐ Never / almost never

(c) How many relatives do you see once a month or more?   …………………………..

**27.**    Are there any friends or acquaintances with whom you have regular contact, either by visit, telephone, letters or e-mail?

☐ Yes (go to Q28)
☐ No (go to Q29)

**28.** (a) How often do you have contact with
any friends or acquaintances?
(please tick one)

☐ Almost daily
☐ About once a week
☐ About once a month
☐ Once every few months
☐ Never / almost never

(b) How often do you regularly visit or
are visited by these friends or acquaintances?
(please tick one)

☐ Almost daily
☐ About once a week
☐ About once a month
☐ Once every few months
☐ Never / almost never

(c) How many friends or acquaintances do you see once a month or more?   …………………

**29. Please read the statements in the four boxes below and tick <u>one</u> box that best describes you.**

| | |
|---|---|
| It is easy for me to become emotionally close to others. I am comfortable depending on others and having others depend on me. I don't worry about being alone or having others not accept me. ☐ | I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me. ☐ |
| I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them. ☐ | I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others. ☐ |

**PEOPLE YOU KNOW**

The questions in this section are about the people you <u>currently</u> know. These might be family members, friends or acquaintances, but they do not include friends of friends or people that you are not <u>personally</u> in contact with. The questions will ask if you currently know someone with a particular skill, resource or occupation – e.g.:

| | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance |
|---|---|---|---|---|---|---|---|---|
| **Do you currently have access to someone who … ?** | | | | | | | | |
| … can repair a broken-down car | | | | | | | | |

Please tick the 'yes' column if you currently have access to someone or 'no' if you don't.

If 'yes', then please tick the column(s) corresponding to the person or people you would be likely to approach if you needed that particular skill or resource.

*If you know someone with more than one skill, resource or occupation, you can refer to this person more than once.*

30. **Do you personally know anyone with the skill or resource listed below that you are able to gain access to <u>within one week</u> if you needed it?**

    *Please answer all these questions, even if you possess the skill or resource yourself or if you have never needed to ask for it before. You will be asked about your skills later on. If 'yes', you may tick more than one box.*

| **Do you currently have access to someone who … ?** | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance |
|---|---|---|---|---|---|---|---|---|
| (i) can repair a broken-down car | | | | | | | | |
| (ii) is a reliable tradesman (e.g. plumber, electrician) | | | | | | | | |
| (iii) can speak another language fluently | | | | | | | | |
| (iv) knows how to fix problems with computers | | | | | | | | |
| (v) is good at gardening | | | | | | | | |
| (vi) has a professional occupation | | | | | | | | |

**30 (cont.)**

**Do you currently have access to someone who … ?**

| | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance |
|---|---|---|---|---|---|---|---|---|
| (vii) is a local councillor | | | | | | | | |
| (viii) works for your local council | | | | | | | | |
| (ix) can sometimes employ people | | | | | | | | |
| (x) knows a lot about government regulations | | | | | | | | |
| (xi) has good contacts with the local newspaper, radio or t.v. | | | | | | | | |
| (xii) knows a lot about health and fitness | | | | | | | | |
| (xiii) knows a lot about DIY | | | | | | | | |

**31.    Are you … ?**

| | Yes | No |
|---|---|---|
| (i) able to repair a broken-down car | | |
| (ii) a tradesman (e.g. plumber, electrician) | | |
| (iii) able to speak another language | | |
| (iv) knowledgeable about fixing problems with computers | | |
| (v) good at gardening | | |
| (vi) someone with a professional occupation | | |
| (vii) a local councillor | | |
| (viii) working for the local council | | |
| (ix) able to sometimes employ people | | |
| (x) knowledgeable about government regulations | | |
| (xi) someone with good contacts with a local newspaper, radio or t.v. | | |
| (xii) knowledgeable about health and fitness | | |
| (xiii) knowledgeable about DIY | | |

**32. If you need someone to help you in the following areas, would you be able to obtain this help from anyone <u>within one week</u>?**

Please answer all these questions, even if you have never needed to ask for it before.
If 'yes', you may tick more than one box.

| **Do you currently personally know anyone who would … ?** | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance |
|---|---|---|---|---|---|---|---|---|
| (i) give you sound advice about money problems | | | | | | | | |
| (ii) give you sound advice on problems at work | | | | | | | | |
| (iii) help you to move or dispose of bulky items (e.g. use of a van) | | | | | | | | |
| (iv) help you with small jobs around the house | | | | | | | | |
| (v) do your shopping if you are ill | | | | | | | | |
| (vi) lend you a small amount of money (e.g. for a local taxi fare) | | | | | | | | |
| (vii) give you careers advice | | | | | | | | |
| (viii) discuss politics with you | | | | | | | | |
| (ix) give you sound legal advice | | | | | | | | |
| (x) give you a good reference for a job | | | | | | | | |
| (xi) get you cheap goods or 'bargains' | | | | | | | | |
| (xii) help you to find somewhere to live if you had to move home | | | | | | | | |
| (xiii) lend you a large amount of money (e.g. for a deposit on a flat) | | | | | | | | |
| (xiv) look after your home or pets if you go away | | | | | | | | |

**33. Do you currently personally know anyone with the following occupations?**

If 'yes', you may tick more than one box.

| | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance |
|---|---|---|---|---|---|---|---|---|
| (i) sales assistant | | | | | | | | |
| (ii) factory worker | | | | | | | | |
| (iii) gardener | | | | | | | | |
| (iv) Member of Parliament | | | | | | | | |
| (v) secretary | | | | | | | | |
| (vi) travel agent | | | | | | | | |
| (vii) university professor | | | | | | | | |
| (viii) estate agent | | | | | | | | |
| (ix) small farmer | | | | | | | | |
| (x) solicitor | | | | | | | | |
| (xi) journalist | | | | | | | | |
| (xii) butcher | | | | | | | | |
| (xiii) police constable | | | | | | | | |
| (xiv) street trader | | | | | | | | |
| (xv) school teacher | | | | | | | | |
| (xvi) accountant | | | | | | | | |
| (xvii) builder | | | | | | | | |
| (xviii) nurse | | | | | | | | |
| (xix) undertaker | | | | | | | | |
| (xx) call centre operator | | | | | | | | |

**LIFE SATISFACTION**

Finally, we want to know how satisfied you feel with certain aspects of your life.

**34.** **How do you feel about your life as a whole?** (please tick one box only)

| Terrible | | Mostly dissatisfied | | Mostly satisfied | | Delighted |
|---|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | Displeased | | Mixed | | Pleased | |

**35.** **Currently, would you say that your physical health is … ?**
(please tick one)

☐ Excellent
☐ Good
☐ Fair
☐ Poor

**36.** **How do you feel about your physical health at present?** (please tick one box only)

| Terrible | | Mostly dissatisfied | | Mostly satisfied | | Delighted |
|---|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | Displeased | | Mixed | | Pleased | |

**37.** **How do you feel about your mental health at present?** (please tick one box only)

| Terrible | | Mostly dissatisfied | | Mostly satisfied | | Delighted |
|---|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | Displeased | | Mixed | | Pleased | |

**38.** **Please answer either (a) if you are currently working or (b) if not.**

**(a)** **How do you feel about your job?** (please tick one box only)

| Terrible | | Mostly dissatisfied | | Mostly satisfied | | Delighted |
|---|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | Displeased | | Mixed | | Pleased | |

**(b)** **How do you feel about not working?** (please tick one box only)

| Terrible | | Mostly dissatisfied | | Mostly satisfied | | Delighted |
|---|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | Displeased | | Mixed | | Pleased | |

**39.** **How do you feel about your financial situation?** (please tick one box only)

| Terrible | | Mostly dissatisfied | | Mostly satisfied | | Delighted |
|---|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | Displeased | | Mixed | | Pleased | |

**40.** **How do you feel about your leisure activities?** (please tick one box only)

Terrible       Mostly dissatisfied       Mostly satisfied       Delighted

☐ — ☐ — ☐ — ☐ — ☐ — ☐ — ☐

     Displeased       Mixed       Pleased

**41.** **How do you feel about the number of friends you have?** (please tick one box only)

Terrible       Mostly dissatisfied       Mostly satisfied       Delighted

☐ — ☐ — ☐ — ☐ — ☐ — ☐ — ☐

     Displeased       Mixed       Pleased

**42.** **How do you feel about the quality of your friendships?** (please tick one box only)

Terrible       Mostly dissatisfied       Mostly satisfied       Delighted

☐ — ☐ — ☐ — ☐ — ☐ — ☐ — ☐

     Displeased       Mixed       Pleased

**43.** **How do you feel about your accommodation?** (please tick one box only)

Terrible       Mostly dissatisfied       Mostly satisfied       Delighted

☐ — ☐ — ☐ — ☐ — ☐ — ☐ — ☐

     Displeased       Mixed       Pleased

**44.** **Please answer either (a) if you live with other people or (b) if you do not.**

**(a)** **How do you feel about the people that you live with?** (please tick one box only)

Terrible       Mostly dissatisfied       Mostly satisfied       Delighted

☐ — ☐ — ☐ — ☐ — ☐ — ☐ — ☐

     Displeased       Mixed       Pleased

**(b)** **How do you feel about living alone?** (please tick one box only)

Terrible       Mostly dissatisfied       Mostly satisfied       Delighted

☐ — ☐ — ☐ — ☐ — ☐ — ☐ — ☐

     Displeased       Mixed       Pleased

**45.** **How do you feel about your relationship with your family?** (please tick one box only)

Terrible       Mostly dissatisfied       Mostly satisfied       Delighted

☐ — ☐ — ☐ — ☐ — ☐ — ☐ — ☐

     Displeased       Mixed       Pleased

**46.** **How do you feel about your personal safety?** (please tick one box only)

Terrible       Mostly dissatisfied       Mostly satisfied       Delighted

☐ — ☐ — ☐ — ☐ — ☐ — ☐ — ☐

     Displeased       Mixed       Pleased

**Thank you for completing this questionnaire.**

**We will send you the final questionnaire in 6 months time.**

**SAFIRE evaluation questionnaire**

| |
|---|
| **The SAFIRE study** |
| **Questionnaire Evaluation** |

**To help us improve this questionnaire, we would be very grateful if you could please answer the following questions:**

1.      **Approximately how long did it take you to complete?**

2.      **Were any questions difficult to answer?**

3.      **If so, which ones?**

4.      **Were any questions difficult to understand?**

5.      **If so, which ones?**

6.      **Do you have any further comments to make about the questionnaire?**

**Thank you very much for your time**

**SAFIRE follow-up questionnaire**

| |
|---|
| **The SAFIRE study** |
| **Questionnaire 2** |

**This is the final questionnaire of the SAFIRE study for you to complete.**

**You will be familiar with many of these questions as you will have answered them in the first questionnaire. Please answer them as they apply to you <u>now</u> to help us understand any changes over the past six months.**

**As this questionnaire is briefer than the first, and you are already familiar with the questions, it should take you only 20-30 minutes to complete.**

**Please answer all the questions and return it with your availability for the interview in the envelope provided as soon as possible. Your responses will be confidential and will not be shared with any third parties.**

**Please write the date you fill this questionnaire in here:…………………………..**

**If you need any assistance in completing this questionnaire, or have any queries about it, please do not hesitate to contact the SAFIRE researcher:**

**Martin Webber,**
**Social Science Fellow,**
**PO32, Health Services Research Department,**
**Institute of Psychiatry,**
**De Crespigny Park,**
**London. SE5 8AF.**

**Tel.**         **020 7848 5096**
**e-mail :**     <u>m.webber@iop.kcl.ac.uk</u>


**Thank you for participating in SAFIRE**

_____

Participant ID:

**HOW YOU FEEL**

**1.** **Please read each of the following statements and circle the response that comes closest to how you have been feeling <u>in the past week</u>. Don't take too long over each response. Your immediate reaction to each statement will probably be more accurate than a long thought-out response. Please give a response to all of the statements.**

| | | | | |
|---|---|---|---|---|
| I feel tense or 'wound up' | Most of the time | A lot of the time | From time to time, occasionally | Not at all |
| I still enjoy the things I used to enjoy | Definitely as much | Not quite so much | Only a little | Hardly at all |
| I get a sort of frightened feeling as if something awful is about to happen | Very definitely and quite badly | Yes, but not too badly | A little, but it doesn't worry me | Not at all |
| I can laugh and see the funny side of things | As much as I always could | Not quite so much now | Definitely not so much now | Not at all |
| Worrying thoughts go through my mind | A great deal of the time | A lot of the time | From time to time but not too often | Only occasionally |
| I feel cheerful | Not at all | Not often | Sometimes | Most of the time |
| I can sit at ease and feel relaxed | Definitely | Usually | Not often | Not at all |
| I feel as if I am slowed down | Nearly all the time | Very often | Sometimes | Not at all |
| I get a sort of frightened feeling like 'butterflies' in the stomach | Not at all | Occasionally | Quite often | Very often |
| I have lost interest in my appearance | Definitely | I don't take so much care as I should | I may not take quite as much care | I take just as much care as ever |
| I feel restless as if I have to be on the move | Very much indeed | Quite a lot | Not very much | Not at all |
| I look forward with enjoyment to things | As much as ever I did | Rather less than I used to | Definitely less than I used to | Hardly at all |
| I get sudden feelings of panic | Very often indeed | Quite often | Not very often | Not at all |
| I can enjoy a good book or radio or TV programme | Often | Sometimes | Not often | Very seldom |

**2.** **Are you currently receiving any treatment for depression?** ☐ Yes (go to Q3)
No (go to Q4)

**3.** **Please state below which treatment(s) you are receiving:**

**LIFE EVENTS**

**4.** **Have any of the following life events or problems happened to you <u>during the last six months</u>. Please tick either 'yes' or 'no'.**

(a) You suffered a serious illness, injury or an assault ☐ Yes
☐ No

(b) A serious illness, injury or assault happened to a close relative ☐ Yes
☐ No

(c) Your parent, child or spouse died ☐ Yes
☐ No

(d) A close family friend or another relative (eg. Aunt, cousin, grandparent) died ☐ Yes
☐ No

(e) You had a separation due to marital difficulties ☐ Yes
☐ No

(f) You broke off a steady relationship ☐ Yes
☐ No

(g) You had a serious problem with a close friend, neighbour or relative ☐ Yes
☐ No

(h) You became unemployed or you were seeking work unsuccessfully for more than one month ☐ Yes
☐ No

(i) You were sacked from your job ☐ Yes
☐ No

(j) You had a major financial crisis ☐ Yes
☐ No

(k) You had problems with the police and a court appearance ☐ Yes
☐ No

(m) Something you valued was lost or stolen ☐ Yes
☐ No

**FRIENDS AND RELATIVES**

The following questions are about people in your life who you feel close to and from whom you can obtain support (either emotional or practical) including close relatives and good friends.

5.      **How many people do you feel very close to?**      ………………………………
        (It does not matter where they live or whether you have seen them recently)

        **If your answer is 0, please go to Q7**
        **If your answer is 1 or above, please answer Q6 onwards.**

6.      **Please answer the following questions about the person whom you have felt closest to in the last 6 months:**

(a)     What is his/her relationship to you?   ……………………………………………….

(b)     What is his/her gender?      ☐ Male      ☐ Female

(c)     How far away does this person live?   ☐ With you
        (please tick one)                      ☐ Within walking distance
                                               ☐ Within half an hour's drive
                                               ☐ Between half an hour and one hour's drive
                                               ☐ More than one hour's drive
                                               ☐ Overseas

(e)     We would like you to rate the practical and emotional support this person has provided for you in the last 6 months. Please tick one response for each question below:

| How much in the last 6 months … ? | Not at all | A little | Quite a lot | A great deal |
|---|---|---|---|---|
| (i) did this person give you information, suggestions and guidance that you found helpful? | | | | |
| (ii) could you rely on this person? Was this person there when you needed them? | | | | |
| (iii) did this person make you feel good about yourself? | | | | |
| (iv) did you share interests, hobbies and fun with this person? | | | | |
| (v) did this person give you worries, problems and stress? | | | | |
| (vi) did you want to confide in, talk frankly or share feelings with this person? | | | | |
| (vii) did you confide in this person? | | | | |
| (viii) did you trust this person with your most personal worries and problems? | | | | |

**6 (cont.)**

**How much in the last 6 months … ?**

| | Not at all | A little | Quite a lot | A great deal |
|---|---|---|---|---|
| (ix) would you have liked to have confided more in this person? | | | | |
| (x) did talking to this person make things worse? | | | | |
| (xi) did he/she talk about his/her personal worries with you? | | | | |
| (xii) did you need practical help from this person with major things, (e.g. looking after you when ill, help with finances or children)? | | | | |
| (xiii) did this person give you practical help with major things? | | | | |
| (xiv) would you have liked more practical help with major things from this person? | | | | |
| (xv) did this person give you practical help with small things when you needed it (e.g. chores, shopping, watering plants)? | | | | |

**7.** Are there any relatives outside your household with whom you have regular contact, either by visit, telephone, letters or e-mail?

☐ Yes (go to Q8)
☐ No (go to Q9)

**8.** (a) How often do you have contact with any relatives outside your household? (please tick one)

☐ Almost daily
☐ About once a week
☐ About once a month
☐ Once every few months
☐ Never / almost never

(b) How often do you regularly visit or are visited by these relatives? (please tick one)

☐ Almost daily
☐ About once a week
☐ About once a month
☐ Once every few months
☐ Never / almost never

(c) How many relatives do you see once a month or more? …………………………

**9.** Are there any friends or acquaintances with whom you have regular contact, either by visit, telephone, letters or e-mail?

☐ Yes (go to Q10)
☐ No (go to Q11)

**10.** (a) How often do you have contact with any friends or acquaintances? (please tick one)

☐ Almost daily
☐ About once a week
☐ About once a month
☐ Once every few months
☐ Never / almost never

(b) How often do you regularly visit or are visited by these friends or acquaintances? (please tick one)

☐ Almost daily
☐ About once a week
☐ About once a month
☐ Once every few months
☐ Never / almost never

(c) How many friends or acquaintances do you see once a month or more?   …………………

**11. Please read the statements in the four boxes below and tick <u>one</u> box that best describes you.**

| | |
|---|---|
| It is easy for me to become emotionally close to others. I am comfortable depending on others and having others depend on me. I don't worry about being alone or having others not accept me. ☐ | I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me. ☐ |
| I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them. ☐ | I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others. ☐ |

**PEOPLE YOU KNOW**

The questions in this section are about the people you <u>currently</u> know. These might be family members, friends or acquaintances, but they do not include friends of friends or people that you are not <u>personally</u> in contact with. The questions will ask if you currently know someone with a particular skill, resource or occupation – for example:

| | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance |
|---|---|---|---|---|---|---|---|---|
| **Do you currently have access to someone who … ?** | | | | | | | | |
| … can repair a broken-down car | | | | | | | | |

Please tick the 'yes' column if you currently have access to someone or 'no' if you don't.

If 'yes', then please tick the column(s) corresponding to the person or people you would be likely to approach if you needed that particular skill or resource.

*If you know someone with more than one skill, resource or occupation, you can refer to this person more than once.*

**12.** **Do you personally know anyone with the skill or resource listed below that you are able to gain access to <u>within one week</u> if you needed it?**

*Please answer all these questions, even if you possess the skill or resource yourself or if you have never needed to ask for it before. You will be asked about your skills later on.*
*If 'yes', you may tick more than one box.*

| | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance |
|---|---|---|---|---|---|---|---|---|
| **Do you currently have access to someone who … ?** | | | | | | | | |
| (i) can repair a broken-down car | | | | | | | | |
| (ii) is a reliable tradesman (e.g. plumber, electrician) | | | | | | | | |
| (iii) can speak another language fluently | | | | | | | | |
| (iv) knows how to fix problems with computers | | | | | | | | |
| (v) is good at gardening | | | | | | | | |
| (vi) has a professional occupation | | | | | | | | |

**12 (cont.)**

**Do you currently have access to someone who … ?**

| | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance |
|---|---|---|---|---|---|---|---|---|
| (vii) is a local councillor | | | | | | | | |
| (viii) works for your local council | | | | | | | | |
| (ix) can sometimes employ people | | | | | | | | |
| (x) knows a lot about government regulations | | | | | | | | |
| (xi) has good contacts with the local newspaper, radio or t.v. | | | | | | | | |
| (xii) knows a lot about health and fitness | | | | | | | | |
| (xiii) knows a lot about DIY | | | | | | | | |

**13.  Are <u>you</u> … ?**

| | Yes | No |
|---|---|---|
| (i) able to repair a broken-down car | | |
| (ii) a tradesman (e.g. plumber, electrician) | | |
| (iii) able to speak another language fluently | | |
| (iv) knowledgeable about fixing problems with computers | | |
| (v) good at gardening | | |
| (vi) someone with a professional occupation | | |
| (vii) a local councillor | | |
| (viii) working for the local council | | |
| (ix) able to sometimes employ people | | |
| (x) knowledgeable about government regulations | | |
| (xi) someone with good contacts with a local newspaper, radio or t.v. | | |
| (xii) knowledgeable about health and fitness | | |
| (xiii) knowledgeable about DIY | | |

**14.** **If you need someone to help you in the following areas, would you be able to obtain this help from anyone <u>within one week</u>?**

Please answer all these questions, even if you have never needed to ask for it before.
If 'yes', you may tick more than one box.

| Do you currently personally know anyone who would … ? | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance |
|---|---|---|---|---|---|---|---|---|
| (i) give you sound advice about money problems | | | | | | | | |
| (ii) give you sound advice on problems at work | | | | | | | | |
| (iii) help you to move or dispose of bulky items (e.g. use of a van) | | | | | | | | |
| (iv) help you with small jobs around the house | | | | | | | | |
| (v) do your shopping if you are ill | | | | | | | | |
| (vi) lend you a small amount of money (e.g. for a local taxi fare) | | | | | | | | |
| (vii) give you careers advice | | | | | | | | |
| (viii) discuss politics with you | | | | | | | | |
| (ix) give you sound legal advice | | | | | | | | |
| (x) give you a good reference for a job | | | | | | | | |
| (xi) get you cheap goods or 'bargains' | | | | | | | | |
| (xii) help you to find somewhere to live if you had to move home | | | | | | | | |
| (xiii) lend you a large amount of money (e.g. for a deposit on a flat) | | | | | | | | |
| (xiv) look after your home or pets if you go away | | | | | | | | |

**15. Do you currently personally know anyone with the following occupations?**

If 'yes', you may tick more than one box.

| | No | Yes | Immediate Family | Wider Family | Friend | Neighbour | Colleague | Acquaintance |
|---|---|---|---|---|---|---|---|---|
| (i) sales assistant | | | | | | | | |
| (ii) factory worker | | | | | | | | |
| (iii) gardener | | | | | | | | |
| (iv) Member of Parliament | | | | | | | | |
| (v) secretary | | | | | | | | |
| (vi) travel agent | | | | | | | | |
| (vii) university professor | | | | | | | | |
| (viii) estate agent | | | | | | | | |
| (ix) small farmer | | | | | | | | |
| (x) solicitor | | | | | | | | |
| (xi) journalist | | | | | | | | |
| (xii) butcher | | | | | | | | |
| (xiii) police constable | | | | | | | | |
| (xiv) street trader | | | | | | | | |
| (xv) school teacher | | | | | | | | |
| (xvi) accountant | | | | | | | | |
| (xvii) builder | | | | | | | | |
| (xviii) nurse | | | | | | | | |
| (xix) undertaker | | | | | | | | |
| (xx) call centre operator | | | | | | | | |

**LIFE SATISFACTION**

Finally, we want to know how satisfied you feel with certain aspects of your life.

**16.  How do you feel about your life as a whole?** (please tick one box only)

Terrible          Mostly dissatisfied          Mostly satisfied          Delighted
[ ]    [ ]    [ ]    [ ]    [ ]    [ ]    [ ]
      Displeased              Mixed                Pleased

**17.  Currently, would you say that your physical health is … ?**
(please tick one)

[ ] Excellent
[ ] Good
[ ] Fair
[ ] Poor

**18.  How do you feel about your physical health at present?** (please tick one box only)

Terrible          Mostly dissatisfied          Mostly satisfied          Delighted
[ ]    [ ]    [ ]    [ ]    [ ]    [ ]    [ ]
      Displeased              Mixed                Pleased

**19.  How do you feel about your mental health at present?** (please tick one box only)

Terrible          Mostly dissatisfied          Mostly satisfied          Delighted
[ ]    [ ]    [ ]    [ ]    [ ]    [ ]    [ ]
      Displeased              Mixed                Pleased

**20.  Please answer either (a) if you are currently working or (b) if not.**

**(a)  How do you feel about your job?** (please tick one box only)

Terrible          Mostly dissatisfied          Mostly satisfied          Delighted
[ ]    [ ]    [ ]    [ ]    [ ]    [ ]    [ ]
      Displeased              Mixed                Pleased

**(b)  How do you feel about not working?** (please tick one box only)

Terrible          Mostly dissatisfied          Mostly satisfied          Delighted
[ ]    [ ]    [ ]    [ ]    [ ]    [ ]    [ ]
      Displeased              Mixed                Pleased

**21.  How do you feel about your financial situation?** (please tick one box only)

Terrible          Mostly dissatisfied          Mostly satisfied          Delighted
[ ]    [ ]    [ ]    [ ]    [ ]    [ ]    [ ]
      Displeased              Mixed                Pleased

**22.  How do you feel about your leisure activities?** (please tick one box only)

Terrible       Mostly dissatisfied       Mostly satisfied       Delighted

☐   ☐   ☐   ☐   ☐   ☐   ☐

Displeased       Mixed       Pleased

**23.  How do you feel about the number of friends you have?** (please tick one box only)

Terrible       Mostly dissatisfied       Mostly satisfied       Delighted

☐   ☐   ☐   ☐   ☐   ☐   ☐

Displeased       Mixed       Pleased

**24.  How do you feel about the quality of your friendships?** (please tick one box only)

Terrible       Mostly dissatisfied       Mostly satisfied       Delighted

☐   ☐   ☐   ☐   ☐   ☐   ☐

Displeased       Mixed       Pleased

**25.  How do you feel about your accommodation?** (please tick one box only)

Terrible       Mostly dissatisfied       Mostly satisfied       Delighted

☐   ☐   ☐   ☐   ☐   ☐   ☐

Displeased       Mixed       Pleased

**26.  Please answer either (a) if you live with other people or (b) if you do not.**

**(a)  How do you feel about the people that you live with?** (please tick one box only)

Terrible       Mostly dissatisfied       Mostly satisfied       Delighted

☐   ☐   ☐   ☐   ☐   ☐   ☐

Displeased       Mixed       Pleased

**(b)  How do you feel about living alone?** (please tick one box only)

Terrible       Mostly dissatisfied       Mostly satisfied       Delighted

☐   ☐   ☐   ☐   ☐   ☐   ☐

Displeased       Mixed       Pleased

**27.  How do you feel about your relationship with your family?** (please tick one box only)

Terrible       Mostly dissatisfied       Mostly satisfied       Delighted

☐   ☐   ☐   ☐   ☐   ☐   ☐

Displeased       Mixed       Pleased

**28.  How do you feel about your personal safety?** (please tick one box only)

Terrible       Mostly dissatisfied       Mostly satisfied       Delighted

☐   ☐   ☐   ☐   ☐   ☐   ☐

Displeased       Mixed       Pleased

**Thank you for completing this questionnaire.**

**We will contact you shortly to arrange the interview.**

**Appendix E: Additional tables for results chapter**

**Table E1 Primary hypothesis regression models evaluated with AIC criteria**

| Model | HAD-D | HAD-A | Length of episode[a] | RG-UK | RG-UK expert advice | Human capital | Education | Income[a] | Emotional support | Attachment | AIC | Delta AIC | Likeli-hood | Akaike's weights | Evidence ratios |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | 590.4 | 0 | 1.000 | 0.796 | 1.00 |
| 2 | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | 594.5 | 4.1 | 0.129 | 0.102 | 7.77 |
| 3 | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 595.1 | 4.7 | 0.095 | 0.076 | 10.49 |
| 4 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | 597.9 | 7.5 | 0.024 | 0.019 | 42.52 |
| 5 | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | | ✓ | 600.7 | 10.3 | 0.006 | 0.005 | 172.43 |
| 6 | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | 602.8 | 12.4 | 0.002 | 0.002 | 492.75 |
| 7 | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | | 606.6 | 16.2 | <0.001 | <0.001 | 3294.47 |
| 8 | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | 606.9 | 16.5 | <0.001 | <0.001 | 3827.63 |
| 9 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | 607.8 | 17.4 | <0.001 | <0.001 | 6002.91 |
| 10 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | | 609.6 | 19.2 | <0.001 | <0.001 | <10,000 |
| 11 | ✓ | ✓ | | ✓ | | | ✓ | ✓ | ✓ | ✓ | 612.4 | 22 | <0.001 | <0.001 | <10,000 |
| 12 | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | | ✓ | 612.9 | 22.5 | <0.001 | <0.001 | <10,000 |
| 13 | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | | | 613.8 | 23.4 | <0.001 | <0.001 | <10,000 |
| 14 | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | | 615.0 | 24.6 | <0.001 | <0.001 | <10,000 |
| 15 | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | ✓ | 616.1 | 25.7 | <0.001 | <0.001 | <10,000 |
| 16 | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | | 617.3 | 26.9 | <0.001 | <0.001 | <10,000 |
| 17 | ✓ | ✓ | | ✓ | | | ✓ | ✓ | | ✓ | 617.8 | 27.4 | <0.001 | <0.001 | <10,000 |

| Model | HAD-D | HAD-A | Length of episode[a] | RG-UK | RG-UK expert advice | Human capital | Education | Income[a] | Emotional support | Attachment | AIC | Delta AIC | Likeli-hood | Akaike's weights | Evidence ratios |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18 | ✔ | ✔ | | ✔ | | | ✔ | ✔ | ✔ | | 620.3 | 29.9 | <0.001 | <0.001 | <10,000 |
| 19 | ✔ | ✔ | ✔ | ✔ | | ✔ | | ✔ | | | 624.0 | 33.6 | <0.001 | <0.001 | <10,000 |
| 20 | ✔ | ✔ | | ✔ | | | | ✔ | ✔ | ✔ | 625.7 | 35.3 | <0.001 | <0.001 | <10,000 |
| 21 | ✔ | ✔ | | ✔ | | ✔ | | ✔ | | ✔ | 625.8 | 35.4 | <0.001 | <0.001 | <10,000 |
| 22 | ✔ | ✔ | | ✔ | | ✔ | ✔ | ✔ | | | 626.2 | 35.8 | <0.001 | <0.001 | <10,000 |
| 23 | ✔ | ✔ | ✔ | ✔ | | | | ✔ | | | 629.4 | 39 | <0.001 | <0.001 | <10,000 |
| 24 | ✔ | ✔ | | ✔ | | | ✔ | ✔ | | | 631.1 | 40.7 | <0.001 | <0.001 | <10,000 |
| 25 | ✔ | ✔ | | ✔ | | | | ✔ | | ✔ | 631.5 | 41.1 | <0.001 | <0.001 | <10,000 |
| 26 | ✔ | ✔ | | ✔ | | | | ✔ | ✔ | | 633.4 | 43 | <0.001 | <0.001 | <10,000 |
| 27 | ✔ | | | ✔ | | | | ✔ | | ✔ | 635.8 | 45.4 | <0.001 | <0.001 | <10,000 |
| 28 | ✔ | | ✔ | ✔ | | | | ✔ | | | 637.1 | 46.7 | <0.001 | <0.001 | <10,000 |
| 29 | ✔ | | | ✔ | | | ✔ | ✔ | | | 637.4 | 47 | <0.001 | <0.001 | <10,000 |
| 30 | ✔ | ✔ | | ✔ | | ✔ | | ✔ | | | 638.8 | 48.4 | <0.001 | <0.001 | <10,000 |
| 31 | ✔ | ✔ | ✔ | | ✔ | | | ✔ | | | 639.1 | 48.7 | <0.001 | <0.001 | <10,000 |
| 32 | ✔ | ✔ | | | ✔ | | | ✔ | | ✔ | 640.4 | 50 | <0.001 | <0.001 | <10,000 |
| 33 | ✔ | ✔ | | | ✔ | | ✔ | ✔ | | | 640.7 | 50.3 | <0.001 | <0.001 | <10,000 |
| 34 | ✔ | ✔ | | | ✔ | ✔ | | ✔ | | | 641.9 | 51.5 | <0.001 | <0.001 | <10,000 |
| 35 | ✔ | | | ✔ | | | | ✔ | ✔ | | 641.9 | 51.5 | <0.001 | <0.001 | <10,000 |
| 36 | ✔ | ✔ | | ✔ | | | | ✔ | | | 644.8 | 54.4 | <0.001 | <0.001 | <10,000 |

| Model | HAD-D | HAD-A | Length of episode[a] | RG-UK | RG-UK expert advice | Human capital | Education | Income[a] | Emotional support | Attachment | AIC | Delta AIC | Likeli-hood | Akaike's weights | Evidence ratios |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 37 | ✓ | ✓ | | | ✓ | | | ✓ | ✓ | | 644.9 | 54.5 | <0.001 | <0.001 | <10,000 |
| 38 | ✓ | | | | ✓ | | | ✓ | | ✓ | 646.1 | 55.7 | <0.001 | <0.001 | <10,000 |
| 39 | ✓ | | | ✓ | | ✓ | | ✓ | | | 646.2 | 55.8 | <0.001 | <0.001 | <10,000 |
| 40 | ✓ | | | | ✓ | | ✓ | ✓ | | | 648.0 | 57.6 | <0.001 | <0.001 | <10,000 |
| 41 | ✓ | | ✓ | | ✓ | | | ✓ | | | 648.1 | 57.7 | <0.001 | <0.001 | <10,000 |
| 42 | ✓ | | | | ✓ | ✓ | | ✓ | | | 650.6 | 60.2 | <0.001 | <0.001 | <10,000 |
| 43 | ✓ | | | ✓ | | | | ✓ | | | 652.3 | 61.9 | <0.001 | <0.001 | <10,000 |
| 44 | ✓ | ✓ | | | ✓ | | | ✓ | | | 653.6 | 63.2 | <0.001 | <0.001 | <10,000 |
| 45 | ✓ | | | | ✓ | | | ✓ | ✓ | | 654.6 | 64.2 | <0.001 | <0.001 | <10,000 |
| 46 | ✓ | | | | ✓ | | | ✓ | | | 662.6 | 72.2 | <0.001 | <0.001 | <10,000 |
| 47 | ✓ | ✓ | | | | | | ✓ | | ✓ | 662.7 | 72.3 | <0.001 | <0.001 | <10,000 |
| 48 | ✓ | ✓ | ✓ | ✓ | | | | | | | 748.8 | 158.4 | <0.001 | <0.001 | <10,000 |
| 49 | ✓ | ✓ | ✓ | | ✓ | | | | | | 758.5 | 168.1 | <0.001 | <0.001 | <10,000 |
| 50 | ✓ | | ✓ | ✓ | | | | | | | 762.2 | 171.8 | <0.001 | <0.001 | <10,000 |
| 51 | ✓ | ✓ | | | ✓ | | ✓ | | | | 764.6 | 174.2 | <0.001 | <0.001 | <10,000 |
| 52 | ✓ | | | | ✓ | | ✓ | | | | 773.1 | 182.7 | <0.001 | <0.001 | <10,000 |
| 53 | ✓ | ✓ | | | ✓ | | | | | ✓ | 773.4 | 183 | <0.001 | <0.001 | <10,000 |
| 54 | ✓ | | ✓ | | ✓ | | | | | | 773.7 | 183.3 | <0.001 | <0.001 | <10,000 |
| 55 | ✓ | ✓ | | | ✓ | | ✓ | | | | 775.6 | 185.2 | <0.001 | <0.001 | <10,000 |

| Model | HAD-D | HAD-A | Length of episode[a] | RG-UK | RG-UK expert advice | Human capital | Education | Income[a] | Emotional support | Attachment | AIC | Delta AIC | Likeli-hood | Akaike's weights | Evidence ratios |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56 | ✔ | ✔ | | ✔ | | | | | ✔ | | 777.4 | 187 | <0.001 | <0.001 | <10,000 |
| 57 | ✔ | | | ✔ | | | | | | ✔ | 779.5 | 189.1 | <0.001 | <0.001 | <10,000 |
| 58 | ✔ | | | ✔ | | | | | | ✔ | 780.5 | 190.1 | <0.001 | <0.001 | <10,000 |
| 59 | ✔ | ✔ | | | ✔ | | | | | ✔ | 782.4 | 192 | <0.001 | <0.001 | <10,000 |
| 60 | ✔ | ✔ | | ✔ | | ✔ | | | | | 784.2 | 193.8 | <0.001 | <0.001 | <10,000 |
| 61 | ✔ | | | | ✔ | | ✔ | | | | 785.9 | 195.5 | <0.001 | <0.001 | <10,000 |
| 62 | ✔ | | | ✔ | | | | | ✔ | | 787.9 | 197.5 | <0.001 | <0.001 | <10,000 |
| 63 | ✔ | ✔ | | | ✔ | | | | ✔ | | 788.9 | 198.5 | <0.001 | <0.001 | <10,000 |
| 64 | ✔ | ✔ | | | ✔ | ✔ | | | | | 789.3 | 198.9 | <0.001 | <0.001 | <10,000 |
| 65 | ✔ | | | | ✔ | | | | | ✔ | 790.6 | 200.2 | <0.001 | <0.001 | <10,000 |
| 66 | ✔ | | | | ✔ | | | | | ✔ | 792.5 | 202.1 | <0.001 | <0.001 | <10,000 |
| 67 | ✔ | ✔ | | ✔ | | | | | | | 792.8 | 202.4 | <0.001 | <0.001 | <10,000 |
| 68 | ✔ | | | ✔ | | ✔ | | | | | 794.1 | 203.7 | <0.001 | <0.001 | <10,000 |
| 69 | ✔ | | | | ✔ | ✔ | | | | | 800.9 | 210.5 | <0.001 | <0.001 | <10,000 |
| 70 | ✔ | ✔ | | | ✔ | | | | | | 801.2 | 210.8 | <0.001 | <0.001 | <10,000 |
| 71 | ✔ | | | | ✔ | | | ✔ | | | 801.3 | 210.9 | <0.001 | <0.001 | <10,000 |
| 72 | ✔ | | | ✔ | | | | | | | 802.8 | 212.4 | <0.001 | <0.001 | <10,000 |
| 73 | ✔ | | | | ✔ | | | | | | 813.5 | 223.1 | <0.001 | <0.001 | <10,000 |

[a]Log transformed

**Table E2 Secondary hypothesis regression models evaluated with AIC criteria**

| Model | QoL baseline | HAD-D | HAD-D change | HAD-A | RG-UK | Human capital | Marital status | Living situation | Employment | Education | Income[a] | Life events | Children | Emotional support | Attachment | RG-UK*Att | AIC | Delta AIC | Likeli-hood | Akaike's weights | Evidence ratios |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  | ✓ |  | ✓ | ✓ |  | ✓ | ✓ | ✓ | ✓ | 306.0 | 0 | 1.000 | 0.347 | 1.00 |
| 2 | ✓ | ✓ | ✓ |  | ✓ | ✓ |  | ✓ |  | ✓ | ✓ |  | ✓ | ✓ | ✓ | ✓ | 308.1 | 2.1 | 0.350 | 0.121 | 2.86 |
| 3 | ✓ | ✓ | ✓ |  | ✓ | ✓ |  | ✓ |  | ✓ | ✓ |  | ✓ | ✓ | ✓ |  | 309.8 | 3.8 | 0.150 | 0.052 | 6.69 |
| 4 | ✓ | ✓ | ✓ |  | ✓ | ✓ |  | ✓ |  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 309.8 | 3.8 | 0.150 | 0.052 | 6.69 |
| 5 | ✓ | ✓ | ✓ |  | ✓ | ✓ |  | ✓ | ✓ | ✓ | ✓ |  | ✓ | ✓ | ✓ | ✓ | 310.1 | 4.1 | 0.129 | 0.045 | 7.77 |
| 6 | ✓ | ✓ | ✓ |  | ✓ | ✓ | ✓ | ✓ |  | ✓ | ✓ |  | ✓ | ✓ | ✓ | ✓ | 310.1 | 4.1 | 0.129 | 0.045 | 7.77 |
| 7 | ✓ | ✓ | ✓ |  | ✓ | ✓ |  | ✓ |  | ✓ | ✓ |  |  | ✓ | ✓ | ✓ | 310.6 | 4.6 | 0.100 | 0.035 | 9.97 |
| 8 | ✓ | ✓ | ✓ | ✓ | ✓ |  |  | ✓ |  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  | 310.9 | 4.9 | 0.086 | 0.030 | 11.59 |
| 9 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  | ✓ |  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 311.0 | 5 | 0.082 | 0.028 | 12.18 |
| 10 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  | ✓ | ✓ |  | ✓ | ✓ | ✓ | ✓ | 311.1 | 5.1 | 0.078 | 0.027 | 12.81 |
| 11 | ✓ | ✓ | ✓ |  | ✓ | ✓ |  | ✓ |  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  | 311.2 | 5.2 | 0.074 | 0.026 | 13.46 |
| 12 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  | ✓ |  | ✓ | ✓ |  | ✓ | ✓ | ✓ |  | 311.3 | 5.3 | 0.071 | 0.025 | 14.15 |
| 13 | ✓ | ✓ | ✓ |  | ✓ | ✓ |  | ✓ |  | ✓ | ✓ |  |  | ✓ | ✓ |  | 311.3 | 5.3 | 0.071 | 0.025 | 14.15 |
| 14 | ✓ | ✓ | ✓ |  | ✓ | ✓ | ✓ | ✓ |  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 311.8 | 5.8 | 0.055 | 0.019 | 18.17 |
| 15 | ✓ | ✓ | ✓ |  | ✓ | ✓ |  | ✓ | ✓ | ✓ | ✓ |  | ✓ | ✓ | ✓ |  | 311.8 | 5.8 | 0.055 | 0.019 | 18.17 |
| 16 | ✓ | ✓ | ✓ |  | ✓ | ✓ | ✓ | ✓ |  | ✓ | ✓ |  | ✓ | ✓ | ✓ |  | 311.8 | 5.8 | 0.055 | 0.019 | 18.17 |
| 17 | ✓ | ✓ | ✓ |  | ✓ | ✓ |  | ✓ |  | ✓ | ✓ | ✓ |  | ✓ | ✓ | ✓ | 312.0 | 6 | 0.050 | 0.017 | 20.09 |
| 18 | ✓ | ✓ | ✓ |  | ✓ | ✓ |  | ✓ |  | ✓ | ✓ | ✓ |  | ✓ | ✓ |  | 312.4 | 6.4 | 0.041 | 0.014 | 24.53 |

| Model | QoL baseline | HAD-D | HAD-D change | HAD-A | RG-UK | Human capital | Marital status | Living situation | Employment | Education | Income[a] | Life events | Children | Emotional support | Attachment | RG-UK*Att | AIC | Delta AIC | Likeli-hood | Akaike's weights | Evidence ratios |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | 312.7 | 6.7 | 0.035 | 0.012 | 28.50 |
| 20 | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | 313.2 | 7.2 | 0.027 | 0.009 | 36.60 |
| 21 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | | 313.3 | 7.3 | 0.026 | 0.009 | 38.47 |
| 22 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | | 313.7 | 7.7 | 0.021 | 0.007 | 46.99 |
| 23 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | 314.7 | 8.7 | 0.013 | 0.004 | 77.48 |
| 24 | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 314.9 | 8.9 | 0.012 | 0.004 | 85.63 |
| 25 | ✓ | ✓ | ✓ | | ✓ | ✓ | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | | 315.5 | 9.5 | 0.009 | 0.003 | 115.58 |
| 26 | ✓ | ✓ | ✓ | | | ✓ | | | | | | ✓ | ✓ | | | | 316.8 | 10.8 | 0.005 | 0.002 | 221.41 |
| 27 | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | | ✓ | ✓ | | | ✓ | | | 317.0 | 11 | 0.004 | 0.001 | 244.69 |
| 28 | ✓ | ✓ | ✓ | | | ✓ | | ✓ | | ✓ | ✓ | | | ✓ | | | 318.2 | 12.2 | 0.002 | 0.0008 | 445.86 |
| 29 | ✓ | ✓ | ✓ | | | ✓ | | ✓ | | ✓ | ✓ | | | | | | 318.6 | 12.6 | 0.002 | 0.0006 | 544.57 |
| 30 | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | | ✓ | | | 319.0 | 13 | 0.002 | 0.0005 | 665.14 |
| 31 | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | | ✓ | ✓ | | | ✓ | | | 319.9 | 13.9 | 0.001 | <0.001 | >1000 |
| 32 | ✓ | ✓ | ✓ | | ✓ | | | | | ✓ | ✓ | | | | | | 321.4 | 15.4 | <0.001 | <0.001 | >1000 |
| 33 | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | | ✓ | ✓ | | | ✓ | ✓ | ✓ | 327.5 | 21.5 | <0.001 | <0.001 | >1000 |
| 34 | ✓ | ✓ | ✓ | | ✓ | | | | | | | | | ✓ | | | 328.5 | 22.5 | <0.001 | <0.001 | >1000 |
| 35 | ✓ | ✓ | ✓ | | | ✓ | | ✓ | | | | | | ✓ | | ✓ | 329.2 | 23.2 | <0.001 | <0.001 | >1000 |
| 36 | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | | | | | ✓ | | ✓ | 329.9 | 23.9 | <0.001 | <0.001 | >1000 |
| 37 | ✓ | ✓ | ✓ | | | ✓ | | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | 331.7 | 25.7 | <0.001 | <0.001 | >1000 |

| Model | QoL baseline | HAD-D | HAD-D change | HAD-A | RG-UK | Human capital | Marital status | Living situation | Employment | Education | Income[a] | Life events | Children | Emotional support | Attachment | RG-UK*Att | AIC | Delta AIC | Likeli-hood | Akaike's weights | Evidence ratios |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 38 | ✔ | ✔ | ✔ | | | ✔ | | ✔ | | ✔ | ✔ | | | ✔ | | | 333.9 | 27.9 | <0.001 | <0.001 | >1000 |
| 39 | ✔ | ✔ | ✔ | | | ✔ | | | | | ✔ | | ✔ | | ✔ | | 335.0 | 29 | <0.001 | <0.001 | >1000 |
| 40 | ✔ | ✔ | | | ✔ | | | ✔ | | ✔ | ✔ | | | ✔ | | | 344.4 | 38.4 | <0.001 | <0.001 | >1000 |
| 41 | ✔ | ✔ | | ✔ | ✔ | | | ✔ | | ✔ | ✔ | | | ✔ | | | 345.6 | 39.6 | <0.001 | <0.001 | >1000 |
| 42 | ✔ | ✔ | | | ✔ | | | ✔ | ✔ | ✔ | ✔ | | | ✔ | | | 346.2 | 40.2 | <0.001 | <0.001 | >1000 |
| 43 | ✔ | ✔ | | | ✔ | | ✔ | ✔ | | ✔ | ✔ | | | ✔ | | | 346.4 | 40.4 | <0.001 | <0.001 | >1000 |
| 44 | ✔ | ✔ | | | ✔ | | | | | ✔ | ✔ | | | ✔ | | | 346.9 | 40.9 | <0.001 | <0.001 | >1000 |
| 45 | ✔ | ✔ | | | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ | | | ✔ | | | 348.2 | 42.2 | <0.001 | <0.001 | >1000 |
| 46 | ✔ | ✔ | | | ✔ | | | | ✔ | ✔ | ✔ | | | ✔ | | | 348.8 | 42.8 | <0.001 | <0.001 | >1000 |
| 47 | ✔ | ✔ | | | ✔ | | | | | | ✔ | | | ✔ | | | 356.5 | 50.5 | <0.001 | <0.001 | >1000 |
| 48 | ✔ | ✔ | | | ✔ | | | | ✔ | | ✔ | | | ✔ | | | 358.5 | 52.5 | <0.001 | <0.001 | >1000 |
| 49 | ✔ | ✔ | | | ✔ | | ✔ | | | | ✔ | | | ✔ | | | 358.5 | 52.5 | <0.001 | <0.001 | >1000 |
| 50 | ✔ | ✔ | | | ✔ | | ✔ | | ✔ | | ✔ | | | ✔ | | | 360.4 | 54.4 | <0.001 | <0.001 | >1000 |
| 51 | ✔ | ✔ | ✔ | | ✔ | | | | | | | | | | | | 396.8 | 90.8 | <0.001 | <0.001 | >1000 |
| 52 | ✔ | ✔ | ✔ | ✔ | ✔ | | | | | | | | | | | | 398.4 | 92.4 | <0.001 | <0.001 | >1000 |
| 53 | ✔ | ✔ | ✔ | | | ✔ | | | | | | | ✔ | | ✔ | | 403.4 | 97.4 | <0.001 | <0.001 | >1000 |
| 54 | ✔ | ✔ | ✔ | | | ✔ | | | | | | ✔ | ✔ | ✔ | ✔ | | 404.3 | 98.3 | <0.001 | <0.001 | >1000 |
| 55 | ✔ | ✔ | ✔ | | | ✔ | | | | | | | ✔ | ✔ | ✔ | | 405.4 | 99.4 | <0.001 | <0.001 | >1000 |
| 56 | ✔ | ✔ | ✔ | | | ✔ | | | | | | ✔ | ✔ | | | | 410.8 | 104.8 | <0.001 | <0.001 | >1000 |

| Model | QoL baseline | HAD-D | HAD-D change | HAD-A | RG-UK | Human capital | Marital status | Living situation | Employment | Education | Income[a] | Life events | Children | Emotional support | Attachment | RG-UK*Att | AIC | Delta AIC | Likeli-hood | Akaike's weights | Evidence ratios |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 57 | ✔ | ✔ | ✔ | | | ✔ | | | | | | | ✔ | | | | 411.5 | 105.5 | <0.001 | <0.001 | >1000 |
| 58 | ✔ | ✔ | ✔ | | | ✔ | | | | | | ✔ | | | | | 414.6 | 108.6 | <0.001 | <0.001 | >1000 |
| 59 | ✔ | ✔ | ✔ | | | ✔ | | | | | | | | | | | 417.1 | 111.1 | <0.001 | <0.001 | >1000 |
| 60 | ✔ | ✔ | ✔ | | | | | | | | | | | | | | 420.0 | 114 | <0.001 | <0.001 | >1000 |
| 61 | ✔ | ✔ | | | ✔ | | | | | | | | | | ✔ | | 433.3 | 127.3 | <0.001 | <0.001 | >1000 |
| 62 | ✔ | ✔ | | | ✔ | | | | | | | | | | | | 437.4 | 131.4 | <0.001 | <0.001 | >1000 |
| 63 | ✔ | | | | ✔ | | | | | | | | | | | | 454.0 | 148 | <0.001 | <0.001 | >1000 |
| 64 | ✔ | ✔ | | | | | | | | | | | | | | | 458.2 | 152.2 | <0.001 | <0.001 | >1000 |
| 65 | | ✔ | | | ✔ | | | | | | | | | | | | 476.8 | 170.8 | <0.001 | <0.001 | >1000 |
| 66 | ✔ | | | | | | | | | | | | | | | | 480.5 | 174.5 | <0.001 | <0.001 | >1000 |
| 67 | | | | | ✔ | | | | | | | | | | ✔ | ✔ | 487.2 | 181.2 | <0.001 | <0.001 | >1000 |
| 68 | | | | | ✔ | | | | | | | | | | ✔ | | 489.6 | 183.6 | <0.001 | <0.001 | >1000 |
| 69 | | | | | ✔ | | | | | | | | | | | | 512.4 | 206.4 | <0.001 | <0.001 | >1000 |

[a]Log transformed

# Appendix F: Publications arising from this thesis

**Webber, M. & Huxley, P. (2004) Mental health and social capitals (letter). British Journal of Psychiatry, 184, 185-186**

guidelines as laid down, for instance, in the scholarly work of Runyan (1982).

What is Schlesinger's own view of the creative person? She tells us (2002) that he/she is a heroic and mystical figure, branded as mad by the jealous and uncomprehending average person. This is a straightforward reiteration of the ideas of the antipsychiatry movement of the 1960s and 1970s. We are back in the realms of the Laingian figure who is simply too insightful and too existentially aware for our society. Have we not moved on since then?

Jamison, K. R. (1989) Mood disorders and patterns of creativity in British writers and artists. *Psychiatry*, **52**, 125–134.

Jamison, K. R. (1993) *Touched With Fire: Manic Depressive Illness and the Artistic Temperament.* New York: Free Press.

Ludwig, A. M. (1995) *The Price of Greatness: Resolving the Creativity and Madness Controversy.* New York: Guilford Press.

Runyan, W. M. (1982) *Life Histories and Psychobiography: Explorations in Theory and Method.* New York: Oxford University Press.

Schlesinger, J. (2002) Issues in creativity and madness. Part two: eternal flames. *Ethical Human Sciences and Services: An International Journal of Critical Inquiry.* **4**, 139–142.

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## Creativity, mental disorder and jazz

I am very happy that Poole (2003) feels that my paper (Wills, 2003) makes a significant contribution to the literature on the relationship between creativity and mental disorder. Nevertheless, I would like to comment on certain points that he makes.

First, the literature on the above topic may be flawed, but it is not small, since an abundance of references extends back at least a hundred years, and it is not inconclusive, since a regular finding is that of the connection between high artistic creativity and mood disorders.

Second, although jazz biographies are written in order to sell books, they tend to be sober, respectful and well-researched, and often are written by academics. Even the most comprehensive psychiatric assessment cannot match the time and effort expended by responsible biographers.

Poole feels that I was uncritical in my acceptance that Thelonious Monk had a dementing process caused by excessive drug usage. My information was taken from the biography by Gourse (1997).

She interviewed Dr Everett Dulit, a Monk afficionado who discussed Monk's case with doctors who knew him, and who felt that drug-induced dementia was the likely diagnosis. Similarly, Poole feels that John Coltrane did not necessarily exhibit pathological behaviours, yet first-person accounts in six Coltrane biographies describe these, and in his acclaimed biography Porter (1998) states, 'There is absolute agreement that Coltrane practiced maniacally...'.

Poole's belief that 'Even severe mental disorder is not incompatible with creativity...there is no negative association between the two' needs clarification. It depends on the type, and the stage of development of the mental disorder. For instance, hypomania often facilitates creativity, but severe depression will extinguish it (Akiskal & Akiskal, 1988).

A better understanding of the link between creativity and mental disorder will help great artists to do what they do best – be creative.

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## Flashbacks in war veterans

Jones *et al* (2003*b*) appears to have missed the point of my letter (Burges Watson, 2003). They define flashbacks as 'a form of dissociative state' (Jones *et al*, 2003*a*). This is the way the term flashback is used in the DSM–IV; 'dissociative flashback episodes' (American Psychiatric Association, 1994). They appear as an example of one of five ways in which 'the traumatic event is persistently re-experienced'. Only one is necessary for the diagnosis. As such they are not 'a core symptom' of post-traumatic stress disorder. As defined in DSM–IV, flashbacks themselves are no more than 'a recurrence of a memory, feeling or

perceptual experience from the past'. This definition may well have been introduced because of the popularity of the term 'flashback' and necessary because its original meaning had been changed by popular usage. Jones *et al* are probably right when they hypothesise that this popularity was encouraged by the use of flashbacks in films and television programmes.

The changing presentation of symptoms associated with the extreme stress of war is indeed interesting. Bizarre dissociative states with physical manifestations, while very common in the First World War, were comparatively rare in the Second World War and very uncommon in Vietnam veterans. Thus, in line with the focus on physical symptoms in earlier wars, it would seem that the presentation of dissociative states has also moved from the physical to the psychological.

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## Mental health and social capitals

The correspondence prompted by McKenzie *et al*'s (2002) editorial suggests that social capital can be the property of individuals as well as groups (Pevalin, 2003; Walkup, 2003). However, McKenzie finds this idea problematic and argues that, as the majority of health scientists conceive of social capital as an ecological concept, we should 'consider effects at an individual level as social networks' (McKenzie, 2003: p. 458). This restricted view rejects the potential contribution to psychiatric research of alternative sociological conceptions of social capital that are both rigorously defined and empirically tested.

One such approach is taken by Lin *et al* (2001) who adopt neo-Marxist notions of capital. Here, social capital is 'investment in social relations by individuals through which they gain access to embedded resources to enhance expected returns of

instrumental or expressive actions' (Lin *et al*, 2001: p. 17). Embedded resources may be collective assets, such as civic associations or social groups, or individual resources such as social support. Individuals have unequal access to social capital because of the strength of interpersonal ties or location within the social structure.

Inequality in access to social capital is hypothesised to produce unequal mental health gains. For example, the inability of a single mother to obtain childcare from her friends and family may increase her risk of depression (Brown *et al*, 1995). Similarly, gaining employment through informal social contacts, as more than a third of the workforce does (Flap, 1999), may provide a positive life change and assist recovery from depression or other mental illnesses. Echoing Pevalin's (2003) views about Bourdieu's work, this approach to social capital is also dynamic and allows us to examine how access to social capital may influence the onset of and recovery from mental illness.

It is clear that there is a family of social capital theories, each measuring slightly different constructs. We do not feel that it is helpful to deny the contribution of one in favour of others. To do so would be to take an unnecessarily limited view and handicap psychiatric research in the process.

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**Flap, H. (1999)** Creation and returns of social capital. A new research program. *La Revue Tocqueville*, **XX**, 5–26.

**Lin, N., Cook, K. & Burt, R. S. (eds) (2001)** *Social Capital: Theory and Research*. New York: Aldine de Gruyter.

**McKenzie, K. (2003)** Concepts of social capital: author's reply (letter). *British Journal of Psychiatry*, **182**, 458.

**McKenzie, K., Whitley, R. & Weich, S. (2002)** Social capital and mental health. *British Journal of Psychiatry*, **181**, 280–283.

**Pevaline, D. (2003)** More to social capital than Putnam (letter). *British Journal of Psychiatry*, **182**, 172–173.

**Walkup, J. (2003)** Concepts of social capital (letter). *British Journal of Psychiatry*, **182**, 458.

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**Author's reply:** The wealth of a country is more than the sum of the wealth of the individuals in it. When times get hard, the wealth of a person may be important but general societal infrastructure, housing, clean water, and the health and social safety net are particularly important. All these factors are linked to the wealth of the country, the distribution of wealth and the investment in a social safety net. It is clear that the health impact of the wealth of the individual is constrained by the wealth of the country – unless they are super rich or super poor. It is also clear that individual wealth is a very different animal from the wealth of a country. They are governed by different rules and indeed they have different names – an individual cannot have a gross domestic product.

Social capital is similar. There are good arguments for considering it at an ecological or an individual level. Just like the wealth of a country or an individual, the concepts of ecological and individual social capital are very different, and using the same name is confusing.

Mr Webber, Professor Huxley and I agree that social capital is the embedded resources of a society such as civic institutions. This is social capital at an ecological level. We would agree that different individuals in the same geographical area may have differential access to this social capital by way of their places in society or social relations. The sum total of social capital that they have access to is limited not only by their ability to get it, but also by the total amount that is available in that area. In addition, differential ability to get social capital is partly a function of the individual but is significantly constrained by the structure of the society that the individual lives in.

The challenge to those who consider social capital at an individual level is to answer the question: what is the added value of conceptualising and renaming social networks as social capital (McKenzie, 2003)? They also have to consider whether they are measuring what social capital is or measuring how it is acquired.

It is confusing to define social capital both as the amount of resources potentially available to anyone in society and as an individual's ability to access such resources.

Moreover, linking ecological and individual variables is fraught with difficulty – classically, the ecological and atomistic fallacies.

Although I argue that another term should be used for individual social capital, I think that these arguments take energy away from what should be the focus of the endeavour which is to improve our ability to describe our social worlds.

I have used the term social capitals previously to describe different types of ecological social capital in an area (McKenzie *et al*, 2002). Using the plural underlines the fact that there are different dimensions of social capital in an area and that the linear scales that some use, so as to label an area high or low in social capital, do not reflect the complex nature of social capital. Areas are better considered dimensionally along the lines of their different social capitals, such as bonding, bridging, vertical, cognitive, structural or social efficacy or cohesion. Such a taxonomy of social capitals could be expanded to include varieties of individual social capital as long as the caveats above have been taken into account.

I do not suggest that the variables that some researchers call individual social capital not be measured. I have, however, suggested that they should be accurately described and named. Perhaps the way forward is to clearly state what is being measured in studies and why, rather than making a further leap to say that proxy measurements reflect social capital which is, of course, a theory that is still in development.

**McKenzie, K. (2003)** Concepts of social capital: author's reply (letter). *British Journal of Psychiatry*, **182**, 458.

**McKenzie, K., Whitley, R. & Weich, S. (2002)** Social capital and mental health. *British Journal of Psychiatry*, **181**, 280–283.

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**Webber, M. (2005) Social capital and mental health. In Tew, J. (Ed.) <u>Social perspectives in mental health. Developing social models to understand and work with mental distress</u>. London, Jessica Kingsley Publishers, 90-111**

# CHAPTER 5

# Social Capital and Mental Health

## *Martin Webber*

## Introduction

Social scientists and policy makers have seized upon the concept of social capital as a panacea for the post-modern disintegration of grand social theory. It has consequently been applied to fields as diverse as international development (World Bank, 2003), democracy and governance (Putnam, 1993) and population health profiles (Kawachi *et al.*, 1997). However, the concept has multiple definitions and dimensions, creating a conceptual minefield that is almost too treacherous to explore.

This chapter will survey this territory to uncover the origins of the concept and the key dimensions of social life to which it refers. It will explore its relevance to mental health and contribute to the emerging debates in the empirical literature, which are still in their infancy. Some tentative conclusions will be reached about its potential use for mental health practitioners and service users.

## Conceptual origins

Social capital refers to the social context of people's lives. The key dimensions it encompasses include trust (Coleman, 1988), social norms and reciprocity (Putnam, 2000), features of social structures and networks (Burt, 1992; Lin, 2001b) and the resources embedded within them (Bourdieu, 1997). Its contemporary origins can be traced to two sociologists, Pierre Bourdieu and James Coleman, and the American political scientist Robert Putnam. Although there is not space for a full conceptual review here (see Baron, Field and Schuller, 2000, for a good critical introduction), it is important to understand the contribution made by these key figures.

### *Pierre Bourdieu*

The influence of Bourdieu in the development of the concept of social capital is often under-stated. This is likely to be because his work is steeped in heavy abstraction, a characteristic of French social theory, undoubtedly a deterrent to more empirically minded British and American intellectuals (Fine, 2001).

The first English translation of Bourdieu's treatment of the concept was contained in a text on the sociology of education. In this, he defined social capital as 'the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalised relationships of mutual acquaintance or recognition' (Bourdieu, 1986 p.248). His treatment of the concept is instrumental, focusing on the benefits accruing to individuals by virtue of participation in groups.

Portes (1998) identified two essential elements of his definition. First, there is the social relationship itself, which allows individuals to claim access to resources possessed by their associates. Second, there is the amount and quality of those resources (Portes, 1998). These resources are characterised by the notion of 'capital', which refers to the capacity to exercise control over one's own future and that of others. As such, it is a form of power. For example, through social capital individuals can gain access to economic capital (e.g. cheap loans), and they can increase their cultural capital through contacts with experts (e.g. academics) or by affiliating to institutions which confer valued credentials (e.g. political parties). In short, the powerful remain powerful by virtue of their contacts with other powerful people.

### *James Coleman*

Coleman developed his ideas about social capital through empirical work on the relationship between educational achievement and social inequality. For him, 'social capital constitutes a particular kind of resource available to an actor' (Coleman, 1988 p.98). Conceptualised and refined within an educational framework, 'social capital is the set of resources that inhere in family relations and in community social organisation and that are useful for the cognitive or social development of a child or young person' (Coleman, 1994 p.300).

In contrast to Bourdieu, Coleman extended the scope of the concept to encompass the social relationships of non-elite groups. He argued that social relations constituted useful capital resources for actors through processes such as establishing obligations, expectations and trustworthiness, creating channels for information, and setting norms backed by efficient sanctions

(Coleman, 1988). For example, 'if A does something for B and trusts B to reciprocate in the future, this establishes an expectation in A and an obligation on the part of B to keep the trust. This obligation can be conceived of as a "credit slip" held by A to be redeemed by some performance by B' (Coleman, 1994 p.310).

Coleman focused largely on kinship and neighbourhood, as his primary interest was schooling. He has been criticised for over-emphasising close ties, to the neglect of weaker ties which might prove more effective in providing access to new knowledge and resources (Portes, 1998). However, his work was a central source for Putnam, who has since popularised the concept.

### Robert Putnam

Putnam's seminal study on social capital was on the rather unlikely topic of regional government in Italy (Putnam, 1993). In this he argued that civic traditions in the north of Italy promoted the growth of voluntary organisations, norms and trust which made possible good governance, legitimate democratic government, as well as economic growth, in contrast to the south of the country.

Transferring his attention to his native US, Putnam investigated the perceived decline in civic engagement. In an evocative paper entitled 'Bowling Alone' (Putnam, 1995), he used the example of the decline in the number of bowling clubs. He argued that these served not just as recreational channels but as sustainers of the wider social fabric. Together with analyses of attitudes and behaviour, he identified a general secular decline in levels of social capital and put the blame on television for distracting people from opportunities for social engagement.

Putnam subsequently conceptualised social capital as 'features of social life — networks, norms, and trust — that enable participants to act together more effectively to pursue shared objectives' (Putnam, 1996 p.34). Social capital became characterised as the 'glue' which holds societies together by collective efficacy, social trust/reciprocity, participation in voluntary organisations and social integration for mutual benefit (Lochner, Kawachi and Kennedy, 1999). Putnam's definition viewed social capital as a contextual property of communities rather than an individual trait. Its benefits are hypothesised to affect everyone equally within that community, regardless of differences in individual behaviour or values.

## Social capital and public health

A number of mental health researchers (e.g. McKenzie, Whitley and Weich, 2002, Sartorius, 2003) accept Putnam's work almost uncritically and argue that social capital benefits all members of a community equally. They suggest that it is a 'public good' arising from participation in civic activities, mutually beneficial norms of reciprocity and the trust people place in other members of the community. This conception of social capital has two essential elements — structural and cognitive components. The former refers to regulated networks that foster mutually beneficial relationships, whereas the latter is the value system that is shared by members of a community and fosters participation in social relationships.

The cognitive component of social capital is best explained by looking at its horizontal and vertical links. First, a distinction is often made between 'bonding' and 'bridging' forms of horizontal social capital. Bonding social capital relies on strong ties between people. It is inward-focused and characterised by homogeneity, loyalty and exclusivity. An example is London's Chinatown, which is characterised by a dense concentration of Chinese firms employing a significant proportion of their co-ethnic labour force.

Bonding social capital can be good for mental health through its close relationships and a mutual responsibility for caring for vulnerable members of the community. The well-developed norms of trust and reciprocity in such communities may affect help-seeking behaviour to the extent that a high proportion of people seek help when unwell. In a US study, for example, Hendryx and Ahern (2001) found that people living in areas high in social capital accessed mental health services more than those with low social capital. These areas may also provide better mental health services. In another US study, for example, communities with high social capital provided better housing for homeless people with mental health problems, although this did not necessarily lead to significant improvements in their health (Rosenheck et al., 2001).

Bonding social capital has a significant downside as a tightly knit homogeneous community might be one intolerant of individual diversity (Baum, 1999). This could possibly explain why the incidence of schizophrenia among people from non-White ethnic minorities is greater in neighbourhoods where they constitute a smaller proportion of the total population (Boydell et al., 2001). A pilot study has found that people who live in areas with high perceived community safety have higher hospital readmission rates (McKenzie, 2000). This could be due to the local community viewing people with mental health problems as potentially dangerous and being less tolerant

of them. The most extremely bonded communities or groups, such as religious cults or mafia families, further exemplify how bonding social capital is not necessarily a public good.

Bridging social capital, in contrast, links diverse groups and people. It is characterised by weak ties and has an outward focus. Examples are business associates, friends of friends or internet virtual encounters. It is likely to foster social inclusion and is generally viewed as positive.

Bridging social capital is the process whereby people with mental health problems can develop social connections with diverse groups and people. It is commonly recognised that this form of social capital is useful for finding employment (Stone, Gray and Hughes, 2003). For example, people involved in groups or volunteering are likely to interact with people they do not know, who in turn may have links with a range of work environments. As employment is key to many conceptions of social inclusion (Stewart, 2000), it can often mean the difference between 'inclusion' and 'exclusion' for some people. This is particularly true for people with mental health problems who face discrimination both at work and in the welfare benefits system (Cullen *et al.*, 2004; Office of the Deputy Prime Minister, 2004). Implicit in the UK government's Social Exclusion Unit focus on mental health is the development of bridging forms of social capital to foster the inclusion of people with mental health problems (Social Exclusion Unit, 2003).

'Vertical' social capital is often distinguished from 'horizontal' social capital by virtue of the connections being made within a hierarchical structure to government and other institutions, rather than within and between communities. Vertical social capital provides a community's institutional integration and, together with bridging forms of social capital, equates to an inclusive and cohesive society (Colletta and Cullen, 2000).

The effect of vertical social capital on mental health is under-researched, but it is possible that it is associated with a community's aggregated socioeconomic status. For example, some relatively deprived inner-London council estates with high rates of mental health problems have high horizontal and low vertical social capital (Cornwell, 1984; Whitley, 2003). Or, in other words, these communities have a multitude of social relations but few to people in positions of power. A contrasting group, for example, are the freemasons who are generally of higher socio-economic status and are very well connected to people in positions of power (high vertical social capital). However, little is known about their mental health.

The cognitive component of social capital appears to relate to Putnam's ideas about altruism and civic responsibility (Putnam, 1996, 2000). It is com-

monly measured in surveys by aggregating responses to questions about trust, reciprocity and perceptions of civic engagement and seems to have a complex relationship with structural social capital.

Structural social capital provides the context for the development of mutually beneficial relationships. These are often networks governed by rules and procedures. The most frequently used measure of structural social capital is voluntary group membership, closely following Putnam's ideas. For example, in Italy he found a good correlation between the number of choral societies and the efficiency of the local health management system (Putnam, 1993). The precise relationship between cognitive and structural social capital is not known. However, it seems that both forms of social capital can erode fast and be destroyed fairly quickly, compared to the building up of such capital, which takes time (Uphoff, 2000).

## What is the evidence?

Social capital is considered to be important for health. On the one hand, it is thought that communities rich in social capital may promote health-enhancing behaviours (Campbell, Wood and Kelly, 1999). On the other, people living in communities with high levels of social capital are more likely to have high levels of perceived control over their lives. People who feel more in control of their lives are more likely to take control of their health and access health services (Wilkinson, 1996).

US social epidemiologists have used the area-based conception of social capital to explore these regional variations in health (Berkman and Kawachi, 2000). In the tradition of Durkheim (1951), they hypothesised that social context has an effect on the health of the whole community or area studied. Their work has taken a variety of proxy measures of social capital with a geographical area as the locus (Lochner *et al.*, 1999). For example, applying Putnam's (1995) indicators of social capital to the US General Social Survey, Kawachi and colleagues (1997) found that lower levels of trust (a cognitive component) and group membership (a structural component) were associated with higher death rates.

A similar result has been found at a neighbourhood level in Chicago. Here, high levels of social capital, as measured by reciprocity, trust and civic participation, correlated with lower death rates (Lochner *et al.*, 2003). A positive relationship between state-level social capital and self-rated health has also been discovered in the US (Kawachi, Kennedy and Glass, 1999; Subramanian, Kawachi and Kennedy, 2001).

The same researchers found a similar correlation of social capital and health in Russia. Here, social capital – as measured by trust in local government, political participation, crime and divorce rates, and conflicts in the work place – accounted for a large proportion of the variation in mortality and life expectancy across the regions of the country (Kennedy, Kawachi and Brainerd, 1998).

There have been similar studies conducted in the UK. For example, Cooper et al. (1999) analysed data from the Health and Lifestyle Survey 1992 and the General Household Survey for 1994, taking six questions about local neighbourhoods as an index of social capital. They found a small association between social capital and health, with a more positive influence for men than for women. However, individual material living conditions and socio-economic status were much stronger predictors of ill health than social capital or social support.

Kawachi and Kennedy argue that the relationship between income inequality and mortality seems to be 'mediated through the withering of social capital' (Kawachi and Kennedy, 1997b p.1039). Or, in other words, social capital studies provide evidence to support the 'Wilkinson Hypothesis' of health inequalities. This suggests that the major determinant of differing levels of health status between areas lies in their degree of income inequality (Wilkinson, 1996). They argue that higher income inequality produces lowered social cohesion and trust, which in turn causes health problems (Kawachi and Kennedy, 1997a).

However, the model connecting health inequalities, social cohesion and health ignores class relations, a factor that might help explain how income inequalities are generated and account for both relative and absolute deprivation (Muntaner and Lynch, 1999). Lynch and colleagues (2001, 2000) argue that the interpretation of links between income inequality and health must begin with the structural causes of inequalities, and not just focus on perceptions of that inequality. Further, the importance of neo-liberalism in producing *both* higher income inequality and lower social cohesion is often ignored (Coburn, 2000).

Empirical work examining the association between social capital and mental health is less well developed and somewhat contradictory. The strongest evidence of an association is found in a UK study (McCulloch, 2001). This found that social capital, as measured by perceptions of the neighbourhood in which you live, appears to be related to common mental disorders such as depression or anxiety. McCulloch's analysis of data from the British Household Survey found that people with low social capital had an increased

risk of suffering from mental health problems. It is not possible to infer causation due to the cross sectional nature of this data. However, he highlights the contextual role of neighbourhoods, independent of the socio-economic status of its residents, in this pattern (McCulloch, 2003).

Other studies have found positive associations. For example, the Health Survey for England 2000 (Boreham, Stafford and Taylor, 2002) found an association between low levels of trust in people in general and common mental disorders such as depression or anxiety. In Russia, Rose (2000) found that social capital and measures of social integration had a substantial impact on self-rated emotional health. Further, a US survey indicated that perceptions of community problems are inversely correlated with psychological health (Hendryx and Ahern, 1997).

There has been some similar work looking at social capital as a risk factor for schizophrenia. Boydell et al. (2002) found an association between low levels of perceived social cohesion and high levels of social hostility, and higher rates of schizophrenia in a pilot study. It could be possible that social hostility and lack of social cohesion are risk factors for schizophrenia. Alternatively, they may be associated with other variables such as urbanicity, which is already believed to be a causative factor (e.g. Marcelis, Takei and van Os, 1999; van Os et al., 2002, Pedersen and Mortensen, 2001).

In contrast, a number of studies have found no association between social capital and mental health. In Colombia, for example, a poor education or lack of employment explains more of the variation in the mental health of young people than cognitive social capital (Harpham, Grant and Rodriguez, 2004). Further, a study of Gospel Oak in north London, which has a particularly high prevalence of depression among older people in comparison with a number of areas in Europe (Copeland et al., 1999), found that it had high levels of social capital (Whitley, 2003). Informal networks of friends, neighbours and relatives were a major source of social capital in Gospel Oak, similar to findings in Luton (Campbell et al., 1999). This pattern has also been observed in communities that suffer socio-economic deprivation and high rates of mental disorder in east London (Cattell, 2001; Cornwell, 1984).

Although these are only relatively small studies of local communities, they do suggest that social capital, as a property of an area, is not a protective factor for mental health problems. It is more likely that the high prevalence of depression is caused by 'compositional' factors. Examples of these are local authority housing policies that place people with mental health problems within a specified geographical area, or other reasons that attract people who

are vulnerable to mental health problems to the area, such as employment or affordable housing.

## Conceptual and empirical limitations

The ecological concept of social capital has often been used without careful consideration of its meaning or definition. Woolcock (1998) has notably stated that it has been adopted indiscriminately, adapted uncritically and applied imprecisely. In particular, Putnam's conception of social capital has come under fierce criticism. Fine (2001, 2002) argues that it is definitionally imprecise, it ignores the reproduction and exercise of power as initially conceived by Bourdieu, and is built upon shaky empirical foundations. He disputes the casual bringing together of the complex notions of 'social' and 'capital', arguing that the concept is essentially meaningless.

Putnam's reliance on formal group membership as an indicator of social capital does not take into account informal groups or networks, important sources of social capital for many people (Schudson, 1996). This introduces a class bias to the conception, as people are more likely to report membership of a golf club than a street gang, for example (Forbes and Wainwright, 2001). For example, he excluded groups formed after 1967 such as those around civil rights, the environment and consumerism (Jackman and Miller, 1998). Further, Putnam's ideas about the nature of community do not stand up well to empirical scrutiny. For example, a study of social capital in Luton concluded that:

> Putnam's essentialist conceptualisation of a cohesive civic community bore a greater resemblance to people's romanticised reconstructions of an idealised past than to people's accounts of the complex, fragmented and rapidly changing face of contemporary community life – characterised by relatively high levels of mobility, instability and plurality. (Campbell *et al.*, 1999 p.156)

Social capital is often accepted uncritically as a public good, but it can be a mixed blessing (Portes and Landolt, 1996). It is perhaps ironic that Timothy McVeigh, convicted of the Oklahoma bombing in 1995, was a member of a bowling league with his co-conspirators (Levi, 1996). Also, homogeneous communities with strong ties and members obedient to social norms can be asphyxiating places to live in and exclusionary to outsiders (Baum, 1999). Such places are likely to be hostile to the development of community mental health facilities in their area, for example (Mind, 1997). Alternatively, industries with strong social ties, or characterised by 'old boy' networks, are

likely to be unwelcoming of newcomers who do not know the 'right' people or are discriminatory towards people who are perceived as being 'different'. Further, working-class communities could be pathologised as having dysfunctional levels of social capital and either written off or subjected to centrally imposed government initiatives (e.g. Social Exclusion Unit, 1998).

There are empirical complications with this research that has implications for understanding the relationship between the ecological conceptualisation of social capital and mental health. First, the proxy measures of social capital are problematic and side-step the complexities of the concept (Portes, 1998). It is not possible to be certain that they are actually measuring social capital as they are giving, at best, a superficial view of the concept (Muntaner, Oates and Lynch, 1999). For example, the studies referred to above all use different proxy measures of social capital, including perceptions of local community (McCulloch, 2001), social cohesion and social hostility (Boydell *et al.*, 2002) and local surveys and voting records (Rosenheck *et al.*, 2001). It is not possible to conclude with certainty that they are measuring the same social phenomena.

Second, the use of cross-sectional survey data to measure social capital has been criticised as being methodologically and theoretically flawed (Forbes and Wainwright, 2001). As there are no true ecological measures of social capital, many studies (e.g. Veenstra, 2000) have relied upon aggregated individual outcomes to measure collective social capital. The upward extrapolation from aggregated individual level data to group level characteristics, known as the atomistic fallacy, is scientifically invalid (Diez Roux, 1998). For example, bringing together a number of brilliant football players into a team does not necessarily mean that the team will perform well together. Aggregated survey data often erroneously makes such assumptions. Survey data also tends to under-represent rural, working-class or marginalised communities (Graham, 1995).

Third, the multi-level statistical models used in a number of these studies do not account for 'selection effects' (Oakes, 2004). This refers to the effect of people's options about where they live being conditioned by social class or socio-economic status. For example, wealthy people will often choose to purchase expensive houses and middle-class people will often choose to live in middle-class neighbourhoods. Poorer people will have less choice about where to live, but will be excluded from wealthy neighbourhoods. It follows that an individual's socio-economic background, which is known to be associated with mental health, clouds the effect of a neighbourhood on their mental health as they are not there by chance alone.

Finally, a common problem with cross-sectional studies that measure ecological social capital is the difficulty in making inferences about causation. It is not possible to say whether low social capital causes mental health problems or whether low social capital results from aggregated mental distress. It is questionable, therefore, what conclusions can be reached from using survey data to examine the relationship between social capital and health. This is unfortunate, as most research about social capital and mental health has been in this tradition.

## The social capital of individuals

A prevalent view in psychiatric epidemiology is that social capital can only be measured at the area level (McKenzie et al., 2002). However, a number of researchers dispute this claim (e.g. Pevalin, 2003; Webber and Huxley, 2004) and call for a move away from Putnam's broad conception of social capital to a more rigorously defined one that builds on Bourdieu's (1986) ideas about the acquisition and use of resources within social networks.

This approach shifts the focus from geographical areas to individuals. It takes a dynamic view of the concept and adopts a quasi-Marxist view of capital. Here, social capital is the 'investment in social relations by individuals through which they gain access to embedded resources to enhance expected returns of instrumental or expressive actions' (Lin, 2001a pp.17–19). For example, just as someone can invest money (financial capital) in a bank or the stock market and expect to get a return on their investment, people can invest in social relationships to gain access to the resources of other people (Hean et al., 2003).

This approach to social capital can be illustrated in terms of family structure. In families where both parents work, each partner promotes the career and income of the other, leading to an accumulation of advantages (Bernasco, de Graaf and Ultee, 1997). However, the loss of social capital in one-parent families through divorce has a detrimental effect on the educational and occupational achievements of the children and of the divorced couple themselves (McLanahan, 1984). Further, research in Taiwan has shown that wives are more reliant on their husbands for access to social resources than visa versa (Fu, Lin and Chen, 2004). It is possible that the loss of these resources on divorce or separation may be more detrimental for women than men. An emerging research programme seeks to answer these questions (Flap, 2004).

Little is known about the association between social capital and the onset of, and recovery from, mental health problems. In fact, it has been noted that

the embeddedness of individual social ties within the broader social structure as a function of obtaining access to material goods, resources and services has not yet been researched within mental health services (Lynch, 2000; Berkman and Glass, 2000). However, this appears to be a promising field of enquiry.

Social ties, or connections between people, are central to this conception and much is known already about their impact on mental health (Kawachi and Berkman, 2001). In general, your life chances are literally enhanced by five to nine years if you are socially well integrated (Berkman and Syme, 1979). In particular, social support has a buffering effect against depression (Brown et al., 1986) and a perceived lack of support increases the likelihood of neurotic symptoms (Berkman and Glass, 2000; Boreham et al., 2002; Henderson, 1981). This is particularly true for women (Cooper et al., 1999). However, paradoxically, social connections may make women with low resources more vulnerable to mental health problems, especially if such connections oblige them to provide social support to others (Belle, 1987; Kawachi and Berkman, 2001).

The nature of social ties can determine what resources are available to individuals within social networks. For example, it has long been established that weak ties between people – such as acquaintances – may lack intimacy, but facilitate the distribution of influence and information (Granovetter, 1973). In terms of employment, informal social networks are influential in helping unemployed people find work (Perri 6, 1997). It has been estimated that more than a third of the workforce do so by this method (Flap, 1999). Further, occupational status attainment is largely attributed to the employment of social resources within one's own network (Lin, Vaughn and Ensel, 1981). Thus, people with mental health problems, for example, can improve their employment or promotion prospects by extending their informal social networks. This can be compared to the bridging form of social capital referred to above.

Strong ties, or close relationships to friends or family members, can be of great importance to people suffering from mental health problems. If these ties are instrumental in providing support, they can protect people's mental health (Cassel, 1974; Brown et al., 1986). It is also known that positive social support has been found to precede recovery from depression (Brown, Adler and Bifulco, 1988; Leenstra, Ormel and Giel, 1995). However, strong ties may also inhibit free choice (Cattell, 2001; Cooper et al., 1999). This may lead to stress or high expressed emotion within families, known triggers for depression (Cohen and Wills, 1985) or relapse in schizophrenia (Leff and Vaughn, 1981), for example.

It is important to note here the distinctions between social capital, social support and social networks. Social capital represents the resources of other people within an individual's social network. These may be accessed to meet a number of goals such as finding a job, obtaining help with DIY or finding new accommodation, for example. Social support is best perceived from the perspective of the person receiving it and can include both emotional and practical support. In short, an individual can gain social support from the supply of social capital they hold within their social network.

Let us consider how social capital may assist an individual in his or her recovery from a mental health problem. A study of religious attendees from a series of surveys conducted in Alameda County in the US between 1965 and 1994 showed that weekly religious attendance was associated with improving mental health, particularly for women (Strawbridge *et al.*, 2001). It may be possible that the resources within the network of the local religious community helped to alleviate symptoms of mental illness. These resources may be emotional support such as 'a shoulder to cry on', practical resources such as financial support or advice and information leading to a successful job application, for example. Alternatively, the social relationships maintained through regular religious attendance may have had a direct beneficial effect on mental health by producing a sense of purpose, belonging, security and recognition of self-worth (Cohen, Underwood and Gottlieb, 2000). There is some evidence to suggest that the availability of resources (broadly defined) appears to reduce stress and the onset of depression for older adults (Norris and Murrell, 1984). However, research tends to indicate that stronger relationships exist between health and resources such as health-specific support than more general support (Tijhuis *et al.*, 1995).

In the context of substance misuse, it appears that social capital is important in the process of natural recovery. Overcoming addictive behaviours strongly correlates to the social context and the resources that adhere to a person's social position (Tucker, 1999; Tucker, Vuchinich and Gladsjo, 1990–1). From a series of in-depth interviews with 46 people who resolved their drug or alcohol dependency without treatment, Granfield and Cloud (2001) suggested that these people may have possessed more social capital than those who were involved in treatment. The participants in the study emphasised the crucial role of social capital, as resources embedded within their social networks, in their recovery.

## Implications for mental health services

Emerging evidence about the role of social capital in the mental health of individuals raises a number of questions for mental health services. For example, do people with more social capital recover more quickly from mental health problems? Are they less likely to access support or treatment from mental health services as they have more resources at their disposal within their social network? Do long periods of hospitalisation diminish the value of an individual's social capital that may be important in their long-term recovery? More work needs to be conducted with mental health service users to investigate these and other questions in this emerging research programme.

It is possible that mental health problems, or the interventions of mental health services, can damage reciprocal relationships that are crucial to the transmission of resources or the paying back of social debts. It follows that interventions focusing on strengthening relationships and networks containing useful resources can be beneficial to people with mental health problems. This could possibly explain why supported employment is more effective than pre-vocational training in helping people with severe mental health problems to obtain competitive employment (Crowther *et al.*, 2001), for example. People placed in competitive jobs with support from 'job coaches' or employment specialists are more likely to be exposed to more diverse social networks than those who receive pre-vocational training in sheltered workshops or on training courses. It is possible that resources embedded within these networks are important to help people to sustain or find new employment.

If there is an association between social capital and recovery from mental health problems, either with or without the assistance of mental health services, it could result in a paradigm shift from a focus on individual pathology to supporting the development of resourceful networks and strengthening interactions within them. This could highlight an important role for social networks beyond the traditional boundaries of the mental health resource centre or psychiatric ward.

## Social capital and social inclusion

People with mental health problems face oppression on the street, at work and even at home, perhaps more than any group in society. This results in social exclusion, of which unemployment is perhaps its most visible element (Warr, 1987). For example, the employment rate of people receiving treatment and

support from the mental health services rarely reaches more than 10 per cent and, when working, they work fewer hours and earn only two thirds of the national average hourly rate (Meltzer *et al.*, 1995; Office for National Statistics, 2002).

Tackling social exclusion has underpinned much of the 'Third Way' policy agenda of the UK government (Giddens, 1998). Reducing exclusion from social capital has been one of the aims of this policy thrust. This approach has been criticised as downplaying the material roots of inequity (Muntaner, Lynch and Davey Smith, 2000). However, there is evidence that access to social capital may vary according to a range of characteristics including socio-economic status (Ziersch, 2002), ethnicity (Boisjoly, Duncan and Hofferth, 1995) and gender (Campbell *et al.*, 1999). This may be relevant in terms of the way that differential access to social capital may link to the broader processes of social exclusion. For example, poorer people often have less access to resourceful people than wealthier people (Lin, 2000). This difference in access to social capital may reinforce existing mental health inequalities.

Sayce (2001) challenges psychiatrists to embrace social inclusion as a treatment goal in line with Standard One of the National Service Framework (Department of Health, 1999). In support of this objective, Huxley and Thornicroft (2003) argue that mental health professionals are able to exert influence on 'ethnos' sources of social exclusion. 'Ethnos' refers to the shared values, identification and sense of cohesion that are engendered by membership of social groups and communities (Berman and Phillips, 2000). Fostering the growth of social relationships and resourceful networks within the community or, in other words, building the infrastructure for social capital, is a key component of this.

In practice, this requires mental health services to be outward-looking and use resources within the local community rather than provide them internally (Leff, 1996). For example, people referred to community mental health teams need to be encouraged to attend social, leisure and educational activities provided by local services rather than specific mental health day services. This is not to denigrate the latter, which do some valuable work and are valued by their users (e.g. Catty and Burns, 2001). Instead, engaging with community resources will provide opportunities for people to develop social networks that may provide potentially important resources for recovery from mental health problems. Such resources may be contacts for employment opportunities, a tradesman to do a domestic job cheaply or a reliable mechanic who

could mend your car in exchange for some babysitting, for example. Even the smallest of favours could relieve a stressful situation.

The oppression and discrimination people with mental health problems face in society poses a huge challenge to this approach. The association between mental illness and violence in the eyes of the public remains strong, although it is empirically weak (Shaw *et al.*, 2004; Taylor and Gunn, 1999). This heightens the stigma surrounding these diagnoses and makes it more difficult for those labelled with the disorder to access networks outside of the mental health services. An anti-oppressive approach by mental health professionals is required to redress power imbalances and to combat this stigma (Thompson, 2001). With the support of organisations such as Rethink Mental Illness, Mentality and Mental Health Media, this approach can facilitate the generation of social capital and alleviate mental distress.

## Conclusion

Social capital is a burgeoning field of enquiry for academics and policy makers. However, its connections with mental health are not yet firmly established and any conclusions to be reached about it must be tentative. The majority of work has focused on social capital as an attribute of a community or geographical area. This has encountered measurement problems and has tended to look at a number of different indicators of social capital. The results are mixed and sometimes contradictory.

A focus on the individual may provide a promising way forward for our understanding of social capital and mental health. Bridging forms of social capital can provide employment opportunities and bonding forms can provide support to people with mental health problems, though they are not without their downsides. Resources within social networks may assist recovery, although more work is needed to establish this connection. Emancipatory and anti-oppressive approaches to mental health practice are called for to provide the foundations for the building of social capital.

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Appendix F

SOCIAL PERSPECTIVES IN MENTAL HEALTH

SOCIAL CAPITAL AND MENTAL HEALTH

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# Measuring access to social capital: The validity and reliability of the Resource Generator-UK and its association with common mental disorder

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## Abstract

Resource generators measure an individual's access to social resources within their social network. They can facilitate the analysis of how access to these resources may assist recovery from illness. As these instruments are culture and context dependent different versions need to be validated for different populations. Further, they are yet to be subjected to a thorough content validation and their reliability and validity have not been established beyond an examination of their internal scales. This paper reports the validity and reliability of a version suitable for general population use in the UK. Firstly, a qualitative process of item selection and review through focus groups and an expert panel ensured that the resource items were relevant. Also, cognitive interviews identified any significant problems prior to extensive piloting. Then we examined its internal domains using Mokken scaling in a small general population survey ($n = 295$). Its concurrent validity with a similar instrument was tested in a further pilot ($n = 335$) and these findings were supported by a known-group validity study ($n = 65$). Its reliability was established in a test–retest study ($n = 47$) in addition to an examination of the reliability coefficients of the internal scales. We found that the Resource Generator-UK has good psychometric properties, though there is some variation in performance between items and scales. Further, we found an inverse relationship with common mental disorder in the second pilot we undertook.
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*Keywords:* UK; Individual social capital; Measurement; Common mental disorders; Psychometrics; Resource generators

## Introduction

Social capital refers to the social context of people's lives. It is a multidimensional concept that includes trust (Coleman, 1988), social norms and reciprocity (Putnam, 1993), features of social structures and networks (Lin, 2001a) and the resources embedded within them (Bourdieu, 1986). It is conceptualised at both individual and collective levels, but its meaning is contested (Kadushin, 2004).

The most prevalent conception of social capital within mental health research is based upon the work of Putnam (1993). Within this tradition attempts have been made to explore associations

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between neighbourhood social capital and mental health in multilevel models (e.g. Drukker, Kaplan, Feron, & van Os, 2003; Rosenheck et al., 2001). Some argue that this feature distinguishes the concept from social networks and support, which operate at an individual level (McKenzie, Whitley, & Weich, 2002). However, a recent systematic review of this literature did not find any consistent associations between ecological social capital and mental health (De Silva, McKenzie, Harpham, & Huttly, 2005). Instead, they found an inverse association between individual cognitive social capital (e.g. trust) and common mental disorder.

In contrast, social capital discourses deriving from social resource theory (Lin, 1982), can provide a dynamic framework for understanding the processes and pathways involved in potential connections between social capital and mental health (Webber & Huxley, 2004). The principle of reciprocity is at the core of this conception, which is embedded in the social foundations of both modern and traditional societies (Lévi-Strauss, 1969).

Reciprocal exchanges are embedded in the social capital theory of Lin (2001a). He defined social capital as "investment in social relations by individuals through which they gain access to embedded resources to enhance expected returns of instrumental or expressive actions" (pp. 17–19). Mental health research within this tradition draws on the extensive literature on social networks and support. Although, the evidence for the effect of features of networks, such as size, density and frequency of contact on mental health, is not consistent (Lin & Peek, 1999), Berkman and Glass (2000) suggest there are at least three mechanisms through which social networks can influence health: the well-being effects of social support (stress-buffering model); the influence on behaviours (main effect model); and the provision of resources and advantages (social capital model).

The stress-buffering model suggests that social support acts as a buffer against psychological distress caused by stressful life events (Cohen & Wills, 1985). Both practical and emotional support are important for good mental health (Lin, Ye, & Ensel, 1999). However, it appears that perceived support is more closely related to psychological distress than received support (Henderson, 1981; Lin & Peek, 1999; Wethington & Kessler, 1986). A perceived lack of support increases the incidence of common mental disorders (Berkman & Glass, 2000; Boreham, Stafford, & Taylor, 2002; Glover,

Burns, Butler, & Patten, 1998; Henderson, 1981; Wethington & Kessler, 1986). This is particularly true for women (Cooper, Arber, Fee, & Ginn, 1999), although social connections may make women with low resources more vulnerable to mental health problems, especially if they are obliged to provide social support to others (Belle, 1987). Further, it could be argued that strong ties have a 'downside' as they may inhibit free choice (Cattell, 2001; Cooper et al., 1999), cause stress and possibly trigger depression (Cohen & Wills, 1985).

The main effect model suggests that participation in social networks can directly affect psychological well-being. One identified pathway is social influence, whereby members of a social network obtain normative guidance about health behaviours, such as physical activity, health care utilisation or treatment adherence (Berkman & Glass, 2000). However, such norms could have either a positive or a negative effect on mental health.

There has been very little research on the effect of resources and advantages gained from networks on mental health (Berkman & Glass, 2000). One study has found that the availability of resources (broadly defined) appears to reduce stress and the onset of depression for older adults (Norris & Murrell, 1984), but no studies have focused on its role in recovery from depression. A more recent study found that access to resources was positively associated with mental health (Ziersch, 2005). She used a brief resource inventory in her cross-sectional survey of social capital and health in Adelaide.

A more comprehensive resource inventory is the resource generator (Van der Gaag & Snijders, 2005). This has the potential to help us to understand more about the role of social resources (aggregated to form one's social capital) in recovery from mental health problems. It was developed to give an overview of the distribution of access to social resources within a population (Flap, 1999) and to facilitate studies exploring how these resources may assist individuals to achieve their goals (Van der Gaag & Snijders, 2005). The instrument measures access to social resources rather than their use.

The resource generator is in the methodological tradition of the name generator/interpreter (McCallister & Fischer, 1978) and position generator (Lin & Dumin, 1986). The former maps respondents' networks as the basis for a comprehensive assessment of resources that can be obtained through them. However, it imposes a substantial burden on the researcher and respon-

dent, produces incomparable findings (Lin, 2001b) and focuses on the structure of social relationships within networks rather than the resources that inhere within them (Van der Gaag & Snijders, 2005). In contrast, the latter measures access to occupational prestige that is seen to represent collections of social resources in a hierarchically structured society, based on Lin's social capital theory (Lin, 1982; Lin, 2001a). The instrument asks respondents whether they personally know people with certain occupations and can be both efficiently administered and easily adjusted for different populations. However, it does not produce specific data about social resources (Van der Gaag & Snijders, 2005).

The resource generator combines the positive aspects of both instruments by referring to specific resources in an efficient questionnaire format (Snijders, 1999). It asks respondents about access to a fixed list of social resources that represent multiple domains of social capital and their relationship to the person through whom they could access that resource. As social resources are culture and context dependent, different versions of the resource generator need to be validated for different populations that may produce some incomparability problems (Van der Gaag & Snijders, 2005).

The resource generator has been used in a Social Survey of the Networks of the Dutch (SSND) (Van der Gaag & Snijders, 2005) and other versions have been used in Canada, Bolivia and Belarussia. Item construction in the Dutch resource generator was theoretically driven, but not extensively pre-tested. To our knowledge, no studies using the resource generator methodology have conducted a thorough content validation process or tested the reliability and validity of the instrument beyond an examination of its internal scales (Van der Gaag & Snijders, 2005). This is particularly important as it can be used in health research to test hypotheses about connections between access to social resources and health status with more precision than the position generator (Van der Gaag, Snijders, & Flap, forthcoming). This paper presents data on the validation of a version suitable for use in the UK and its association with common mental disorder in a UK sample.

## Methods

We validated the Resource Generator-UK (RG-UK) as a self-complete questionnaire, using the structure of the Dutch instrument (Van der Gaag & Snijders, 2005) to facilitate comparison but amended its items to make them accessible to a UK respondent.

The content validity of the RG-UK was assessed qualitatively using focus groups of people drawn from the UK general population and an expert panel of academics. We adopted a maximum variation sampling strategy (Patton, 2002) for the recruitment of focus group participants to achieve a broad range of perspectives on useful social resources. In all, 22 people participated in four focus groups in London and South Yorkshire. Although small, the sample was socially and demographically heterogeneous: 14 (63.6%) were women, 5 (22.7%) were non-white British, 8 (36.4%) were aged under 30 and 3 (13.6%) were aged over 60, and all the major groups of the Standard Occupational Classification (SOC) (Office for National Statistics, 2000) were represented.

Focus group participants completed a draft version of the RG-UK individually prior to a discussion about the stem questions and the relevance of the items, which they rated on a five-point scale of how likely they were to need to ask someone for each skill or resource. Finally, participants were asked to suggest new items for the instrument. The groups were tape-recorded, transcribed in full and coded using NVivo v2.0 (QSR International, 2002).

An expert panel of seven academics with research experience in sociology, social epidemiology or social psychiatry reviewed the questions and items for the RG-UK, which had been amended following the focus groups. We used the nominal group technique (Van de Ven & Delbecq, 1972) to determine the extent to which the panel members agreed about the items and to resolve disagreements.

Prior to the meeting, panel members were asked to rate how useful they thought each of the items were to a member of the general population on a seven-point scale adapted from Jones and Hunter (1995). Agreement was defined as panel members all scoring within a 3-point range. Items that could not be agreed upon during the meeting were discussed, rerated and reanalysed (Scott & Black, 1991).

Cognitive testing is important in questionnaire development as it helps us to analyse the way in which respondents understand and answer questions and helps the researcher to detect concealed as well as noticeable problems (Collins, 2003; Qureshi

& Rowlands, 2004). Therefore, we conducted eight cognitive interviews. The sample size was determined by the principle of theoretical saturation (Coyne, 1997), so we continued the interviews until no new problems emerged with the instrument. Although the sample was predominantly female ($n = 6$, 75%) and white British ($n = 7$, 87.5%), the major groups of the SOC (Office for National Statistics, 2000) were represented. The interviews were tape-recorded and their analysis was conducted as an iterative process. Amendments were made to the RG-UK as required.

We used an exploratory non-parametric item response theory model, the 'Mokken scaling method' (Mokken, 1997; Sijtsma & Molenaar, 2002), for item reduction and scaling. This method was used by Van der Gaag and Snijders (2005) and appears to be the most appropriate one for the RG-UK. Mokken scaling aims to find robust and one-dimensional scales within sets of items. It begins by taking pairs of items with the strongest associations and continues by gradually including other well-fitting items until a scale has been formed that does not improve any further when other items are added (Mokken, 1997).

Cumulative scale analyses was performed using MSP5 for Windows (Molenaar & Sijtsma, 2000). This uses Loevinger's $H$-coefficients (Loevinger, 1947) to express the fit of specific items within a scale and for the homogeneity of the scale as a whole. Uncorrelated items produce values of $H = 0$, whereas perfectly homogenous scales produce values of $H = 1$. Conventionally, scales with $H \geqslant 0.3$ are useful, $H \geqslant 0.4$ are medium strong and $H \geqslant 0.5$ are strong scales (Mokken, 1997).

The Mokken scaling method allows for each item to appear in only one scale. The procedure eliminates items that do not fit within any scale if their item homogeneity $H_i$ falls below a set value, conventionally $H_i = 0.3$ (Mokken, 1997). Further, a reliability coefficient $\rho$ is calculated for each scale. Values above 0.6 are conventionally taken as indications of sufficient reliability (Molenaar & Sijtsma, 2000).

To obtain data for item analysis and scaling we administered the RG-UK by postal self-complete questionnaire to a random sample of 1000 people from the edited electoral registers of four wards in south London and south Yorkshire. The edited registers contained all those eligible to vote in May 2004 who had consented to be on the list available for purchase for research purposes; 295 question-

naires were returned and, accounting for incomplete questionnaires ($n = 11$), we achieved an adjusted response rate of 29.8%. Significantly more women completed the questionnaire than men ($\chi^2(2) = 11.69$, $p < 0.001$), but the response did not vary according to electoral ward.

Women were overrepresented in the sample, particularly from the London wards (62.1% vs. 52.7%), but its average age was very similar to the local population. The sample was drawn from all ethnic and occupational groups approximately in proportion to the 2001 census (Office for National Statistics, 2003).

To establish its test–retest reliability we recruited a non-random sample of 47 participants that broadly reflected the demographic characteristics of the UK population, although women were overrepresented. Participants were asked to self-complete the RG-UK. Two weeks later they were asked to complete the instrument again. Reminders were provided to participants who forgot to complete the questionnaire a second time to ensure there was not a significant time delay; 33 participants (70.2%) conducted the retest 2–3 weeks after the first completion, but nine (19.2%) took 3–5 weeks and five (10.6%) took over 5 weeks.

To measure item test–retest reliability we calculated the kappa coefficient (Cohen, 1960) for each of the RG-UK items. The criteria we used to evaluate these coefficients were adapted from Landis and Koch (1977) and have been used in the evaluation of a number of psychiatric rating scales (e.g. Silverman, Saavedra, & Pina, 2001): $> 0.74$ indicates excellent reliability; between 0.59 and 0.74 indicates good reliability; between 0.40 and 0.58 indicates fair reliability; and $< 0.40$ indicates poor reliability. For each of the RG-UK's scales we calculated their intra-class correlation coefficients (Bartko, 1966) and used the same criteria as above to evaluate them.

The traditional assessment of criterion validity against a 'gold standard' measure of social capital is not possible, as such an instrument does not exist. Instead, we assessed the convergent and divergent validity of the RG-UK against a position generator (PG-UK) that was developed for the purpose of this study and a measure of locus of control (Coleman & DeLeire, 2003), respectively. We expected the RG-UK to be more closely correlated with the PG-UK, which measures a similar construct, than with locus of control, which evaluates individual beliefs about internal or external control over events (Rotter,

1972). Locus of control was chosen due to its long association with mental health (Levenson, 1973) and because it helps us to explain why social support can act as a buffer against the development of depression (Dalgard, Bjork, & Tambs, 1995).

We aimed to use data from this validity test to perform sub-group analysis across the internal scales. Also, by administering the self-complete 12 item General Health Questionnaire (GHQ) (Goldberg & Williams, 1988), we aimed to explore how access to social resources may vary according to the likely presence of a common mental disorder.

From the same electoral registers we selected a new random sample of 1000 people and administered the RG-UK, PG-UK, measure of locus of control and the GHQ in a postal questionnaire. Two further mailings were sent to non-respondents and we achieved a total response of 335. The response rate, adjusted for 15 ineligible respondents, was 34.0%.

Significantly more women completed the questionnaire than men ($\chi^2(2) = 11.00$, $p < 0.01$) and significantly fewer people from one of the London wards completed the questionnaire than the other 3 wards ($\chi^2(3) = 9.50$, $p < 0.05$). Women ($n = 190$, 56.7%) were slightly overrepresented in the sample and the average age of respondents was slightly older than the general population in the two areas. The sample was drawn from all ethnic and occupational groups approximately in proportion to the 2001 census.

The RG-UK scales were not substantially skewed, so we used $t$-tests, one-way analysis of variance (with Bonferroni correction to allow for multiple comparisons) and Pearson's correlation coefficients to explore associations between socio-demographic variables and RG-UK scale scores. Finally we performed an exploratory linear regression analysis using the stepwise forward selection method to develop a multivariate explanatory model for each scale. We tested for a curvilinear relationship between age and the RG-UK scale scores by including the variable age-squared, but its inclusion made very little difference to the regression models. We categorised age into decades and, as it made very little difference to the goodness of fit of the models, we decided to report this for ease of interpretation.

We conducted a known-group validity test to provide further evidence about the instrument's validity. This test assesses the performance of a measure in a population known to be deficient in or have an abundance of the construct in question and is used in the absence of a 'gold standard' criterion to compare it with Stewart, Hays, and Ware (1992).

There is good evidence to suggest that higher educational attainment is positively correlated with access to social capital (Lin, 2001a; Van der Gaag & Snijders, 2005). Therefore we selected a group of 100 academics from King's College London as a 'known group' of people who will score higher on the RG-UK, as they are likely to have access to more social capital than the general population. The non-random sample was selected from the register of staff in September 2004. We achieved a 65% response rate with one mailing; 35 (53.9%) of the sample were men and 6 (9.2%) were of non-white ethnicity; 43 (66.2%) were of senior lecturer status or above. The largest difference from the general population sample, which completed the instrument for the convergent/divergent validity test, was that the academics were on average 5.06 (95% CI = 0.91–9.20) years younger.

We calculated the difference between the scale means for the RG-UK between the sample of academics and the general population sample using $t$-tests and controlled for the effect of age using linear regression. This procedure was repeated for the sub-scales. All analysis, unless otherwise stated, was conducted in STATA v.9 (StataCorp, 2006).

## Results

The definition of social capital that the resource generator methodology addresses appears to correspond with a lay understanding of the concept and to resonate with the experiences of the focus group participants. In particular, reciprocity emerged as a common underlying theme in these discourses. In close relationships where the exchange of resources was routine and reciprocal, participants felt at ease with accessing their social capital. On the other hand, in situations where it was not possible to reciprocate offers of resources, participants felt uncomfortable asking for them. The focus groups highlighted some minor difficulties with completion of the questionnaire that we were able to address at an early stage. Lengthy discussions about individual items resolved ambiguities and helped us to develop a list of resources relevant to people in the UK. Of the 35 items we began the focus groups with, 14 were unchanged, 15 were amended, 6 were dropped and 9 new ones were added.

The expert panel reviewed the results of the focus groups and suggested amendments to the instrument. The panel agreed that the instrument measured access to social resources through personal networks that imply a degree of trust and reciprocity, as planned by its creators (Van der Gaag & Snijders, 2005). As the stem question specifically asks if the skill or resource could be obtained within 1 week, it implies access is more or less instantaneous. This requires relationships that are characterised by a degree of trust and reciprocity so that the help could be obtained without hesitation.

Panel members were concerned that social class could bias responses to the RG-UK, so the instrument was amended to include items that were relevant to all socio-economic groups. Also, to distinguish the RG-UK from measures of social support, the panel discarded items relating to emotional support. Following two rounds of ratings, 35 items remained in the instrument.

In general, the cognitive interviewees accurately understood the questions in the RG-UK and answered them as honestly as possible. One was dyslexic, but she was able to read the instructions and complete the instrument correctly without any assistance. Interviewees' thought processes, the questions they asked the researcher and the way they completed the questionnaire reflected an accurate understanding of the instrument. However, we made minor changes to the RG-UK in response to some problems that our interviewees encountered.

In the first pilot, data was not available for an average of 0.60 items/respondent. This is slightly lower than the SSND, where data was missing for 0.90 items/respondent on average (Van der Gaag & Snijders, 2005). As data was gathered in the SSND by face-to-face interview, where a researcher can repeat questions until a response is obtained, this suggests that self-complete postal questionnaires can yield equally full data sets for analysis. To check for potential bias caused by missing data, we examined whether respondents who did not answer at least one item ($n = 87$) were significantly different from those who provided full data ($n = 208$) in a multivariate logistic regression model. Black ethnicity was the only significant variable in the model, but was not present when we repeated the analysis in the second, larger, pilot.

MSP produced four internal scales of the RG-UK, which we have labelled domestic resources,

Table 1
Resource Generator-UK internal scales

| | $H_i$ |
|---|---|
| *Domestic resources ($n = 276$, $H = 0.52$, $\rho = 0.78$)* | |
| Knows a lot about DIY | 0.40 |
| Help you to move or dispose of bulky items | 0.43 |
| Help you with small jobs around the house | 0.58 |
| Get you cheap goods or 'bargains' | 0.54 |
| Help you to find somewhere to live if you had to move home | 0.56 |
| Lend you a large amount of money | 0.59 |
| Look after your home or pets if you go away | 0.51 |
| *Expert advice ($n = 266$, $H = 0.54$, $\rho = 0.83$)* | $H_i$ |
| Has a professional occupation | 0.60 |
| Knows a lot about government regulations | 0.58 |
| Has good contacts with the local newspaper, radio or TV | 0.46 |
| Give you sound advice about money problems | 0.49 |
| Give you sound advice on problems at work | 0.58 |
| Give you careers advice | 0.52 |
| Discuss politics with you | 0.52 |
| Give you sound legal advice | 0.49 |
| Give you a good reference for a job | 0.61 |
| *Personal skills ($n = 279$, $H = 0.37$, $\rho = 0.69$)* | $H_i$ |
| Can repair a broken-down car | 0.34 |
| Is a reliable tradesman | 0.39 |
| Is good at gardening | 0.45 |
| Works for your local council | 0.32 |
| Can sometimes employ people | 0.36 |
| Knows a lot about health and fitness | 0.36 |
| *Problem solving resources ($n = 287$, $H = 0.42$, $\rho = 0.60$)* | $H_i$ |
| Can speak another language fluently | 0.45 |
| Knows how to fix problems with computers | 0.39 |
| Is a local councillor | 0.54 |
| Do your shopping if you are ill | 0.34 |
| Lend you a small amount of money | 0.41 |

expert advice, personal skills and problem solving resources, respectively (Table 1). The domestic resources and expert advice sub-scales have strong homogeneity and good reliability. Although weaker, the personal skills and problem solving sub-scales have sufficient scale $H$ values to be useful.

Finally, we used MSP to test whether the 27 items of the four sub-scales formed one homogenous scale. The homogeneity of the 27-item RG-UK scale was sufficient to form one scale ($H = 0.37$) with high reliability ($\rho = 0.89$). It appears to be a stronger scale than the one used in the SSND as the scale $H$ for the latter was only 0.21 (Van der Gaag & Snijders, 2005). Further, within-scale inter-item correlations were positive and significant.

The kappa coefficients for the RG-UK items ranged from 0.33 to 0.85 in the test–retest pilot. The

majority of items had good or excellent reliability, but two items ('give you sound advice about money problems' and 'help you to find somewhere to live if you had to move home') had a poor reliability (kappa = 0.33 and 0.37, respectively). As these two items both made strong contributions to the domestic and expert advice sub-scales we decided to retain them.

There was no systematic variation in kappa coefficients according to sub-scale. However, all except one of the items from the personal skills sub-scale had a good or excellent reliability, whereas all the items in the problem solving sub-scale had moderate reliability (0.48–0.62)

The intra-class correlation coefficient for the RG-UK was good ($r = 0.67$). Similarly, the domestic resources ($r = 0.61$) and personal skills ($r = 0.66$) sub-scales had good test–retest reliability. However, the expert advice sub-scale had only fair reliability ($r = 0.49$) and the problem solving sub-scale reliability was poor ($r = 0.35$)

In the convergent/divergent validity test, the shared variance of the RG-UK and PG-UK was 48%, in contrast to the 8% shared variance of the RG-UK and locus of control (Coleman & DeLeire, 2003). This suggests that the RG-UK and PG-UK measure a similar construct that is distinct from locus of control. Both the RG-UK and PG-UK have weak negative correlations with the GHQ ($r = -0.11$ and $-0.14$, $p < 0.05$, respectively) in contrast to external locus of control, a known health correlate, which has a stronger association ($r = -0.45$, $p < 0.0001$).

The sample of academics had access to a mean of 19.23 (95%CI = 18.11–20.35) out of 27 resources in the RG-UK scale, 1.99 (95%CI = 0.42–3.56) more than the mean of the general population sample ($t(336) = 2.50$, $p = 0.013$). A significant difference was also found in the expert advice and problem solving sub-scales, but not in the domestic and personal skills ones. However, when this difference was controlled for age, it reduced the mean group difference in the RG-UK scale to 1.48 (95%CI = 0.01–2.96) resources ($p = 0.049$). Adjusted for age, academics had access to a mean of 1.53 (95%CI = 0.93–2.13) more resources in the expert advice sub-scale and 0.58 (95%CI = 0.31–0.86) in the problem-solving sub-scale.

The average item endorsement frequency was reduced from 66.7% in the first pilot to 62.1% in the second, rather lower than in the SSND (76%) (Van der Gaag & Snijders, 2005). Only one resource was accessible to more than 90% of respondents (Table 2), suggesting that ceiling effects are minimal. No resources were accessible to less than 15% of respondents suggesting that there are no floor effects for RG-UK items.

The adjustments made to the RG-UK following the first pilot did not significantly reduce the amount of missing data. There remained an average of 0.6 missing items/respondent. However, proportionately fewer respondents missed at least one item (17.3% vs. 29.5%), meaning that data from a higher proportion of respondents was available for sub-scale analysis. Also, the missing data was largely evenly spread across all 27 items and was below 5% for all except three items, which were all related to employment. These items were not systematically omitted according to any of the demographic variables that we measured.

Respondents in the second general population pilot ($n = 335$) had access to a mean of 17.24 out of 27 social resources (95%CI = 16.54–17.93) on the RG-UK scale. Most were accessible through kin ties, though rarer resources were more frequently accessed through non-kin ties (Table 2).

Respondents' age had a slight curvilinear relationship with RG-UK scores with access to resources decreasing more rapidly with increasing age (Table 3). Ethnicity and not being in paid work were also associated with access to fewer resources. Additionally, a likely presence of common mental disorder was associated with fewer resources in all except the expert advice and problem solving sub-scales.

The RG-UK scale had a very strong positive correlation with its four sub-scales (Table 4). However, the inter-scale correlations were only moderate, suggesting that they each represent different sub-collections of social resources. When the RG-UK is used in studies as an independent variable the sub-scales may be useful in explaining some of the variance in the dependent variable.

## Discussion

This study is the first extensive psychometric evaluation of the resource generator methodology. It suggests that the instrument can be a reliable and valid measure of access to social resources. Although there is some variation in the performance of the scales and individual items, the collective evidence suggests that it includes relevant items for

Table 2
Resource Generator-UK item frequencies

| | | $n$ | % 'Yes' | If yes, % access through: | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Imm. family | Wid. family | Friend | Neigh. | Colleague | Acquain. |
| | *Do you currently have access to someone who …?* | | | | | | | | |
| a1 | Can repair a broken-down car | 330 | 59.1 | 37.9 | 11.8 | 32.8 | 8.7 | 5.6 | 17.9 |
| a2 | Is a reliable tradesman | 328 | 72.0 | 30.9 | 11.4 | 39.4 | 5.9 | 3.0 | 21.2 |
| a3 | Can speak another language fluently | 331 | 49.6 | 42.1 | 14.0 | 42.1 | 7.9 | 15.2 | 7.9 |
| a4 | Knows how to fix problems with computers | 325 | 73.2 | 38.2 | 12.6 | 34.9 | 2.1 | 15.1 | 10.9 |
| a5 | Is good at gardening | 330 | 80.3 | 60.8 | 12.8 | 22.6 | 7.9 | 2.6 | 7.2 |
| a6 | Has a professional occupation | 327 | 82.9 | 56.8 | 20.7 | 41.0 | 12.2 | 19.9 | 16.6 |
| a7 | Is a local councillor | 329 | 26.4 | 9.2 | 6.9 | 28.7 | 8.0 | 3.4 | 50.6 |
| a8 | Works for your local council | 328 | 40.9 | 26.1 | 10.4 | 36.6 | 6.7 | 9.7 | 24.6 |
| a9 | Can sometimes employ people | 329 | 56.8 | 36.4 | 17.1 | 38.0 | 6.4 | 16.0 | 15.5 |
| a10 | Knows a lot about government regulations | 331 | 41.4 | 42.3 | 14.6 | 26.3 | 2.9 | 17.5 | 19.7 |
| a11 | Has good contacts with the local newspaper, radio or TV | 330 | 17.6 | 22.4 | 6.9 | 39.7 | 3.4 | 12.1 | 12.1 |
| a12 | Knows a lot about health and fitness | 330 | 57.6 | 42.1 | 13.2 | 38.9 | 5.3 | 11.6 | 11.6 |
| a13 | Knows a lot about DIY | 332 | 83.1 | 58.0 | 15.2 | 35.1 | 8.3 | 5.8 | 9.4 |
| | *Do you currently know anyone who would …?* | | | | | | | | |
| b1 | Give you sound advice about money problems | 330 | 70.3 | 48.7 | 9.5 | 30.6 | 2.2 | 10.8 | 22.4 |
| b2 | Give you sound advice on problems at work | 311 | 67.9 | 41.2 | 11.4 | 39.8 | 1.4 | 41.2 | 6.2 |
| b3 | Help you to move or dispose of bulky items | 330 | 79.7 | 52.9 | 14.4 | 39.2 | 14.4 | 6.8 | 8.0 |
| b4 | Help you with small jobs around the house | 331 | 87.9 | 69.1 | 13.7 | 33.7 | 9.6 | 1.4 | 4.5 |
| b5 | Do your shopping if you are ill | 332 | 94.3 | 77.6 | 8.9 | 32.9 | 14.1 | 2.2 | 1.3 |
| b6 | Lend you a small amount of money | 329 | 89.4 | 79.9 | 20.4 | 48.6 | 15.5 | 14.9 | 4.3 |
| b7 | Give you career advice | 316 | 51.3 | 47.5 | 11.1 | 39.5 | 0.6 | 38.3 | 9.9 |
| b8 | Discuss politics with you | 332 | 61.1 | 60.6 | 21.2 | 49.8 | 4.9 | 18.2 | 9.4 |
| b9 | Give you sound legal advice | 332 | 49.4 | 26.8 | 10.4 | 39.0 | 1.2 | 14.0 | 23.8 |
| b10 | Give you a good reference for a job | 314 | 83.8 | 17.1 | 10.3 | 52.1 | 12.2 | 57.0 | 15.2 |
| b11 | Get you cheap goods or 'bargains' | 330 | 44.6 | 51.0 | 22.4 | 47.6 | 8.2 | 10.2 | 15.0 |
| b12 | Help you to find somewhere to live if you had to move home | 329 | 66.6 | 74.9 | 26.5 | 39.7 | 3.7 | 6.4 | 3.2 |
| b13 | Lend you a large amount of money | 324 | 42.6 | 82.6 | 16.7 | 18.1 | 0.7 | 0.7 | 1.4 |
| b14 | Look after your home or pets if you go away | 328 | 86.0 | 63.8 | 16.0 | 40.8 | 35.5 | 1.8 | 3.2 |

its target population, is easy to complete and performs reliably in this population.

In the pre-testing phase we debated whether or not to include a 'not applicable' option. We decided against this as it could lead to difficulties in interpreting the results. Respondents may mark this if they have access to a resource but do not need it at present. For example, someone who is currently self-employed and does not want to change jobs may not need to ask someone for careers advice or a reference. However, their situation may change at any time giving rise to the need for one or more of these resources. Alternatively, a respondent who is retired may also mark 'not applicable' to these items as they are outside the employment market and do not need to access these resources. In both these situations a tick in a 'not applicable' column would not indicate *potential* access, which we are

Table 3
Regression models for Resource Generator-UK scales

|  | Variable | Beta | $p$ |
|---|---|---|---|
| Resource Generator-UK scale $R_{\text{adj}}^2 = 0.229$, $F(11, 236) = 7.67$, $p < 0.0001$ | Age > 69[a] | −0.45 | < 0.001 |
|  | Age 60–69[a] | −0.41 | < 0.001 |
|  | Age 50–59[a] | −0.34 | < 0.001 |
|  | Age 40–49[a] | −0.24 | 0.005 |
|  | 'Other' ethnicity[b] | −0.19 | 0.001 |
|  | GHQ case[c] | −0.16 | 0.005 |
|  | Black ethnicity[b] | −0.15 | 0.010 |
|  | Student[d] | −0.14 | 0.023 |
|  | Unemployed[d] | −0.13 | 0.025 |
| Domestic resources scale $R_{\text{adj}}^2 = 0.182$, $F(7, 277) = 10.00$, $p < 0.0001$ | Age > 69[a] | −0.33 | < 0.001 |
|  | Age 50–59[a] | −0.28 | < 0.001 |
|  | 'Other' ethnicity[b] | −0.23 | < 0.001 |
|  | Age 60–69[a] | −0.20 | 0.001 |
|  | Black ethnicity[b] | −0.16 | 0.003 |
|  | GHQ case[c] | −0.16 | 0.005 |
|  | Age 40–49[a] | −0.15 | 0.019 |
| Expert advice scale $R_{\text{adj}}^2 = 0.210$, $F(13, 252) = 6.41$, $p < 0.0001$ | Age 60–69[a] | −0.26 | 0.004 |
|  | Age > 69[a] | −0.25 | 0.002 |
|  | Retired[d] | −0.22 | 0.031 |
|  | Student[d] | −0.21 | 0.001 |
|  | Age 50–59[a] | −0.17 | 0.015 |
|  | SOC groups 7–9[d] | −0.17 | 0.006 |
|  | Armthorpe ward[e] | −0.17 | 0.004 |
|  | Age 40–49[a] | −0.15 | 0.029 |
|  | Unemployed[d] | −0.15 | 0.012 |
|  | Home-maker[d] | −0.14 | 0.019 |
|  | Disabled[d] | −0.12 | 0.045 |
| Personal skills scale $R_{\text{adj}}^2 = 0.168$, $F(9, 275) = 7.37$, $p < 0.0001$ | Unemployed[d] | −0.20 | < 0.001 |
|  | Age > 69[a] | −0.19 | 0.001 |
|  | Age 60–69[a] | −0.17 | 0.003 |
|  | 'Other' ethnicity[b] | −0.16 | 0.004 |
|  | Selhurst ward[e] | −0.14 | 0.042 |
|  | GHQ case[c] | −0.13 | 0.016 |
| Problem solving resources scale $R_{\text{adj}}^2 = 0.139$, $F(9, 277) = 6.13$, $p < 0.0001$ | Age 60–69[a] | −0.26 | < 0.001 |
|  | Age > 69[a] | −0.21 | < 0.001 |
|  | Unemployed[d] | −0.19 | 0.001 |
|  | Disabled[d] | −0.16 | 0.003 |
|  | Selhurst ward[e] | −0.16 | 0.016 |
|  | Ashburton ward[e] | −0.15 | 0.032 |
|  | Age 50–59[a] | −0.14 | 0.020 |
|  | Armthorpe ward[e] | −0.14 | 0.040 |

Only variables significant at $p < 0.05$ tabulated.
[a] Contrast group = Age < 30.
[b] Contrast group = White ethnicity.
[c] Contrast group = GHQ non-case (scoring < 4).
[d] Contrast group = SOC groups 1–3 (Office for National Statistics, 2000).
[e] Contrast group = Torne Valley ward (largest mean).

trying to capture in the instrument. Instead, we emphasised in the guidance that respondents should answer each item whether it was currently applicable or not.

The RG-UK performed as expected in the convergent/divergent validity test. Additionally, the RG-UK and its sub-scales generally have good test–retest reliability, although the problem solving

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Table 4
Correlation matrix of resource generator-UK sub-scales

|  | RG-UK scale | Domestic | Expert advice | Personal skills | Problem solving |
|---|---|---|---|---|---|
| RG-UK scale | 1 |  |  |  |  |
| Domestic | 0.84* | 1 |  |  |  |
| Expert advice | 0.87* | 0.58* | 1 |  |  |
| Personal skills | 0.81* | 0.61* | 0.55* | 1 |  |
| Problem solving | 0.72* | 0.51* | 0.58* | 0.46* | 1 |

*$p < 0.0001$.

resources sub-scale performed poorly in this test. This scale had the lowest reliability of the RG-UK scales in the first piloting phase, indicating that it needs to be used with some caution.

Most of the scales varied as expected between the sample of academics and the general population, demonstrating their validity. It may not be reasonable to expect academics to score higher in the domestic resources and personal skills sub-scales, as they may not have the opportunity to develop the necessary contacts. Therefore, it may be worthwhile to test the validity of these sub-scales using a different sub-group.

The lower average item endorsement frequencies for our samples may reflect the smaller and more homogenous population in The Netherlands where respondents may be more likely to have connections with people providing a multitude of resources. Equally, though, it may merely indicate that our respondents have smaller networks or access to fewer resources than the Dutch general population. It is equally possible that the exclusion of social support items from our instrument artificially reduced the item endorsement frequencies. However, any comparison with Van der Gaag & Snijders's (2005) study is limited by our small sample and the different modes of administration. While other studies indicate that interviewer-administered and self-complete questionnaires do not produce significantly different results (e.g. Fowler & Gallagher, 1999; Wu et al., 1997), further methodological testing of potential context effects is required.

In our regression models (Table 3) having probable common mental disorder was independently associated with having access to fewer resources. This correlates with research in the tradition of Putnam (1993) where an inverse relationship has been found between individual social capital and common mental disorder (De

Silva et al., 2005). Speculative hypotheses about these associations include an absolutely low level of resources acting as a vulnerability factor in the development of depression. Also, the loss of previously accessible and valued resources may increase vulnerability or act as a trigger for an episode. It is also possible that access to resources may diminish as common mental disorders persist, possibly as a result of diminished social networks through social withdrawal.

As both the RG-UK and PG-UK had similar correlations with the GHQ and as the position generator methodology is more established, it could be argued that it is not worthwhile developing the resource generator further as a predictor of health status. However, resource generators have the advantage of including more detailed resource information rather than occupations alone which can only be proxies for social resources. As the resource generator authors indicate, it provides greater resource specificity and can be used alongside or instead of other social capital instruments (Van der Gaag et al., forthcoming).

The strongest predictor of access to resources in the RG-UK was age (Table 3). The slight curvilinear association did not follow an inverse U curve as in other studies of Western societies (Lin, 1999). Black and 'other' ethnic minority respondents had access to fewer resources as in other studies (Lin, 1999). Further, respondents not in paid work had access to fewer resources across all the domains except for domestic resources. However, larger samples are required for more definitive results and the instrument needs testing in a representative general population survey to enable full comparisons with other surveys such as the SSND (Van der Gaag & Snijders, 2005).

Low response rates in our two main pilots limit our ability to generalise our findings to the UK population as a whole. In particular, as we lacked data on

non-respondents we were unable to determine whether this group had deficits in access to social capital that in some way prejudiced their participation. Also, our relatively small samples limited our ability to comprehensively test the operation of the instrument within different population sub-groups. Further testing using a large representative survey is required to examine the distribution of social resources across population sub-groups.

There was a difference of 4 weeks between the earliest and latest follow-up in the test–retest study. Although we believe the construct to be stable for up to 6 weeks, the reliability of the instrument could have been more accurately determined using a consistent time delay. Further, resource constraints limited our recruitment options and a non-random, relatively small sample was far from ideal. Further research using a larger random sample with a more consistent time gap between completions is required to confirm the instrument's reliability. A strict approach to reliability testing would see the instrument lose several items due to their low–moderate kappa values. However, instrument development is a trade off between high reliability coefficients or being able to capture many sub-domains of a construct. As social capital is multifaceted and difficult to measure, it is arguably appropriate to have a larger instrument capturing a diversity of social resources at the expense of a few poor reliability coefficients.

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**Appendix G: Co-authored publications with contributions arising from this thesis**

**van der Gaag, M. & Webber, M. (2007) Measurement of individual social capital: questions, instruments, and measures. In Kawachi, I., Subramanian, S. V. & Kim, D. (Eds.) <u>Social capital and health</u>. New York, Springer-Verlag, 29-49.**

# 2
# Measurement of Individual Social Capital
## Questions, Instruments, and Measures

MARTIN VAN DER GAAG AND MARTIN WEBBER

The idea that social relationships can be conceptualized as potentially productive, "social" additions to personally owned resources has been welcomed as an attractive, explanatory mechanism in many areas of social and economic research. The assessment of resources embedded in social networks, potentially available to individuals or the larger community as a whole, has gradually become an established extension to conceptual models which may provide useful, additional explanations for many research questions with socio-demographic aspects. Although still enmeshed in debates about the meaning of "social capital", health researchers are also gradually realizing the explanatory potential of this concept to health outcomes. However, the translation of this idea into valid and reliable quantification has proven to be cumbersome, as the number of leads that can be followed in matters of operationalisation and measurement have proved labyrinthine; this has resulted in many incomparable measures and instruments (Flap, 1999, 2004).

Conceptualized in its individual form, social capital refers to all possible kinds of resources potentially owned by social network members, which may become available to a focal individual as a result of mutual investments in a shared past, of which the social relationships with these network members form evidence (Van der Gaag & Snijders, 2004). A definition of social capital at this individual level remains quite close to its original analogy with more traditional notions of financial and material "capital", which have been developed and accepted in the academic world for more than 200 years (see e.g. beginnings by Quesnay, 1766) – the idea that relationships can be invested in and form "capital" that may harvest returns in the future is, similar to human and cultural capital, directly derived from economy. Perhaps this is the reason that when defined at the individual level by leading scholars (Bourdieu, 1980; Burt, 1992; Flap, 1999, 2004; Lin, 2001), social capital shows much less variation in the number and nature of dimensions specified than collective level social capital, where large differences between various conceptualizations are prevalent (Coleman, 1988; Putnam, 1993).

For the development of systematic, comparable social capital measurement instruments, the perspective of individual level social capital offers the most simple and clearly defined units of measurement – a focus on the individual avoids the common interpretation problems in analyses that stem from the use of

aggregated data, in which the problem of "modifiable area unit" may be encountered. The methodology of individual social capital research is essentially based on social network research, a well-established research area within which many insights for operationalization, and tools for data collection have been readily developed.

In this chapter, we aim to provide an overview of current methods and instruments for the measurement of individual social capital, and to the various methodological concerns that shape these methods. A first section introduces research questions and theoretical issues that shape the desired characteristics of social capital measurement. A second section discusses ways to construct social capital indicators from available data. A final and third section discusses the three main measurement instruments for individual social capital currently available: the name generator, the position generator, and the resource generator. As an illustration of advanced measurement in individual social capital research, we conclude the chapter with an example from a recent study using the resource generator instrument for a UK sample.

## 2.1. Questions That Shape Measurement

The use, design, and quality of social capital measurement can only be judged when its eventual applications are made explicit. Disregarding any specific, topical domains such as the job market, status attainment, personal well-being, health issues, etc., social capital research questions can be categorized into three main issues.

The first and most important of these is that individual social capital research considers an inequality question, based on the presumption that people equipped with "better" social capital will succeed better in attaining their goals (Flap, 2004; in the section "measures" we will further specify which characteristics of social capital could be considered "better" social capital). Generally, four explanatory mechanisms for this hypothesis are specified. Social network members and their resources are expected to be helpful in goal attainment because they 1) significantly add to an individual's collections of personal resources, such as his cultural, human, material, and political capital (e.g. the social network may provide more useful information about jobs than can be gathered by an individual on the market), 2) provide unique resources that cannot be produced or purchased to satisfaction individually (e.g. love, friendship, emotional support, and opportunities for reproduction are poorly available on the market), 3) may actively provide help without asking (e.g. by means of recommendations), and 4) form the identity of one's social network to the "outside world", which may work as an advertisement for an individual (Lin, 1999a, 2001; Van der Gaag, 2005:40).[1] Summarized, the

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[1] Each of these mechanisms also provides unique forms of *social liability* — a term proposed by Leenders and Gabbay (1999) to identify negative experiences specifically caused by social network members. This chapter does not explicitly discuss such negative sides to social capital.

general issue regarding social capital is to investigate its *productivity*, and shed light on the question whether social networks are actually helpful in attaining individuals' goals.

Social capital is a complex, latent construct with several dimensions: in its individual form it refers to social relationships with alters[2] with different personal characteristics, various social resource collections, and, in some lines of social capital research, also patterns of relationships between network members (network structure). Therefore, a second, main research issue considers the question which configuration, which part, or which resource domain of social capital is productive in a certain context. Empirical findings have shown that to find a job, or attain higher social status through one's social network, social capital should be specific; it is necessary to know the right people with the right resources in order to climb the social ladder (Flap & Völker, 2001; Lin, 1999b). On the other hand, in order to find a house, or to enjoy company in general, rather unspecific social capital (as indicated by having a large social network) seems to be sufficient. Apparently, the resources responsible for such outcomes, which concern any member in the population, may successfully be passed on through any network member (Van der Gaag & Snijders, 2003; Van der Gaag, 2005:191–194). Summarized, not all kinds of relationships and resources represented by social capital are important at the same time, and specific configurations of these have distinct roles in its productivity in distinct contexts. These types of questions can therefore be labeled as investigations about social capital's *goal specificity* (Flap, 1999, 2002). As yet, knowledge about which social capital dimensions are responsible for any productivity is still fragmented.

If some configuration of social capital is productive for individuals in a certain context, this also implies decreased opportunities for those lacking it, and reproduction of inequality through the use of social capital (Flap, 1991, 2004; Lin, 2001:99–124). Therefore, a third main social capital research issue is the *identification of advantaged and deprived groups,* or the question how social capital is distributed over the general population (Flap, 1991, 2002, 2004). Eventually, studies addressing this issue may provide the translation of social capital research into future policy advice.

Making these research questions explicit is necessary because these directly shape social capital measurement at the level of operationalization and indicator construction. As will be discussed in the next section, so far many researchers have operationalized social capital into single, and rather unspecific indicators of "something useful about the social network". Social capital research in exploratory stages, aimed at uncovering *the existence* of a relationship between individual social capital and its productivity, may indeed harvest meaningful, if not very specific, results from using a single indicator. However, the desire to identify *which*

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[2] In ego centered social network research, the focal individual of a social network is denoted as "ego", whereas any, unspecified social network member is denoted as an "alter". For reasons of fluidity, we also use these terms throughout this chapter.

*part or quality* of social capital is responsible for any effect directly requires the development of multiple social capital indicators, each tuned towards specific sub dimensions; the same is true for almost all questions about the distribution of social capital over the population. Although some researchers have already emphasized the need to construct multiple measures for social capital at an early stage (e.g. Campbell, Marsden, & Hurlbert, 1986), most of them have not recognized the need to use multiple measures to measure social capital full yet.

## 2.2. Measure Construction

A latent, complex construct with several dimensions offers many opportunities for measurement – in the case of social capital perhaps even too many. Systematic research into its productivity and goal specificity has been slow in development and has seen the construction of many different, incomparable measures; often, these seem to have been developed based on available data rather than valid operationalization. The main cause for this is, however, that for many research domains more specific ideas about the productivity of social capital are difficult to establish firmly. Social capital investigators are often confronted with the fact that they do not really know which indicators could be essential to explain their studied outcomes: will an hypothesized effect stem from the presence of specific alters, types of relationships, social resources, the structure or size of the social network, all of these, or some of these aggregated into some useful combination? In the overview below, we discuss the potential value of several principles as a basis for social capital measures.

**Social network structure** Since individual social capital research gradually evolved from social networks research, it is not surprising that many authors have operationalized social capital from a structural point of view. Assessing the relative advantage of an individual's position in a social network, such social capital measures are calculated from data matrices about relationships in networks with clear boundaries, of which all members participate in research (see overview by Borgatti, Jones, & Everett, 1998). Many of these studies are investigations to which some form of entrepreneurship is the central topic, locating advantageous positions in environments characterized by competition. Therefore, most measures are based on the expected added value from sparse networks full of "structural holes" (Burt, 1992), containing few relationships between alters, and capitalizing on the idea of accessing diverse information at minimal costs. This preconception is not universally transferable to other research domains, such as personal health, in which social capital functioning within an environment conducive to trust and network closure can often seem more beneficial (Coleman, 1990). Single measures of network structure could serve as indicators in social capital productivity research, but these only refer to patterns of relationships, not explicitly to social resources, leaving explanations of any productivity effects rather implicit. However, the need for well-defined boundaries to local populations also reduces their usefulness, since research applications in the health domain usually require data

samples of general population in such settings opportunities for the calculation of structural social capital measures are severely limited.[3]

**Presence of specific alters** Other social capital measures are based on data from ego-centered social network research, which results in traditionally structured data sets. Most of these depart from theoretical notions regarding one single dimension of social capital; often, this concerns the existence of specific relationships or (groups of) specific alters. For example, Granovetter's (1973) classic argument about the strength of weak ties refers to the theoretical advantage of weaker relationships in the attainment of instrumental goals; subsequently, the proportion of weak ties in a person's social network can be used as a social capital measure. In a health context, where the attainment of expressive goals is often more central, indicators of the presence of strong ties in the social network (e.g. the proportion of strong ties among all relationships) could be considered useful. Such measures do not directly refer to social resources however, and their inclusion in explanatory models only tells us something very general about social network effects. Instead of relationships, another perspective is the identification of specific classes of network members. Since neighbors, friends, family members, etc. give access to specific sets of social resources (Felling, Fiselier, & Van der Poel, 1991), measures indicating the presence of alters with specific *roles* can serve as indirect social capital indicators. However, for insight into the productivity and nature of these social resources, additional data will be needed. Checking for specific role-players in social networks is also marked by the problem that not all productive roles are easily labeled – while these may indeed be potentially helpful it is, for example, not very productive to ask respondents to list "intriguing, vague acquaintances" in their network. Other specific classes of network members are formed by socio-demographic denominations, such as alters of specific age, gender or ethnicity. The nature of any specific social resources attached to socio-demographic positions also remains very implicit, and their beneficial effects as social capital are also possibly very population-specific. Since the theoretical meaning of such indicators can therefore be very different between social capital studies, their ad hoc inclusion usually also adds to the incomparability of findings. Only one indicator of social capital directly referring to specific, productive persons in the network has found systematic use – this is discussed in the section about the "position generator" measurement instrument.

Newer ideas for social capital indicators have moved away from any specific presumptions about useful categories and configurations of persons and relationships, and aim to characterize an individual's social network as a whole on more general, morphological grounds.

**Volume** One of the first notions used to characterize an individual's social capital was formulated by Bourdieu (1980) in terms of volume, or the total amount of

[3] It is possible to calculate network structure indicators from ego-centered data by asking respondents whether, and how well their network members know each other (see section "name generator"). Such observations are unreliable, however.

social resources one has potential access to. Having remained largely intuitive, the idea is that having "more" social capital is productive as a result of all four mechanisms specified earlier, and adds to sustain the production of individual well-being. Following this argument, it would be logical to construct measures of social capital volume as cumulative indicators of "all resources" of "all members" of an individual social network. This meets with the problem that, apart from the fact that measurements of "all resources" of "all members" are susceptible to reliability and boundary problems, this would require the collection of extensive sets of data per individual (see section "name generator"). Therefore, measuring social capital volume to any detail has not become very popular in this form. The use of social network size as a social capital volume indicator, counting the number of different alters mentioned in an interview, can be seen as a more economical version, omitting resource measurements. This measure could be used as a single indicator to detect goal-*un*specific effects of social capital, where any productivity stems from the sheer number of people one knows (see section "questions"). However, an extended rationale that the more people one knows, the more resources they will generally represent, and the more helpful the network will be, is perhaps a bit limited. Using measures of social capital volume in explanatory analysis also has limitations in terms of content validity. Theoretically, not all social capital available in a social network can or will contribute to the attainment of goals: most goals are attained by the use of personally owned resources, [4] and there will be many duplications of resources between alters. For most social resources, it is not the question how much or how many of them are present in the social network in order to be helpful (which is implicit in cumulative counting), but whether at least one instance of them is present at all. Summarized, multiple alters giving access to the same resources can be unnecessary, inconvenient, or normatively restricted to give help (Van der Gaag & Snijders, 2004).[5] An inventory of all resources may therefore require the collection of much superfluous information.

**Diversity** A logical further specification of social capital volume is its diversity: an account whether elements of different kinds are represented in the social network by at least one instance. Several authors have proposed the idea that specific resources and relationships can be located and accessed more successfully when more differentiation in alters, resources and relationships is present in the network, hence resulting in better social capital (Burt, 1992; Erickson, 1996, 2003; Flap, 1991; Granovetter, 1973; Lin, 2001; see also Erickson, in Lin & Erickson, forthcoming). Social capital diversity measures can be constructed in a straightforward way for relationships (e.g. variation in relationship strength or role), alters with specific characteristics (e.g. variation in gender, age groups, ethnicity, etc.), but operationalizations most valid in terms of social capital are those establishing the more explicit resource diversity of a person's social network (e.g. variation in alters' education, occupational prestige, etc.). So far, diversity measures are general, single social capital indicators making the most of their parsimony, incorporating robust content validity, while being sufficiently transferable to diverse social capital contexts to enable comparisons between studies.

**Social resources** While being the most obvious indicators for the concept of social capital, measures referring to resources of social network members were neglected for a long time. Perhaps the problem *which* of all possible social resources should be indicated by social capital measures, and how these should result in indicators, was central to this omission. The history of the concept of "capital" shows that its operationalization has always been complex, even when usually referring to relatively straightforward financial and material resources only (Hennings, 1987). For social capital, this question is even more complex, since the idea of "social resources" may refer to any collection of resources owned by network members. In the traditional categorization of capital used in the social sciences, social capital therefore includes the financial (money), human (education and skills), cultural (symbolic knowledge), and political capital (power) of network members. Investigations of the productivity, and especially of the goal specificity of social capital, should therefore ideally be capable of indicating which of these classes of social resources help individuals to attain their goals; hence a good social capital measurement instrument should contain separate indicators for each of these collections – within any research domain.[6] However, since the number of *possible* social resources that can be distinguished seems almost infinite, it is difficult to point out exactly which resources should be included in indicators of social resources from each of these classes.

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[4] This argument gets even more important when we realise that because it creates an obligation to pay back services in the future, using social capital is also costly. For some goals, using social capital is also awkward for the seeker of help – it is quicker and more practical to clean one's dishes oneself. Having social capital of some quality is therefore not an immediate, automatic blessing. For the attainment of most goals individuals are self-sufficient, either through the direct use of personal resources, or by buying solutions (goods and services) on the market. Only a small proportion of potentially accessed resources is used; when asked about the resource generator instrument, a number of participants commented that they would probably not ask for a number of the resources they had access to (Webber & Huxley, submitted).

[5] Several alters providing similar resources could be seen as "insurance" for a certain kind of help, because across relationships the opportunities for alters to actually provide help will vary over time. However, a possible lack of an opportunity to exchange help will only block very specific social capital transactions – usually, helping is without hurry. Furthermore, in many social networks there is an established order among network members who has to help first; help is therefore less easily mobilised from other than "usual" alters. Therefore, having social network "extras" in theory shows diminishing returns.

[6] A measurement instrument constructed this way will be capable of specifying the productivity of social capital as follows. If none of these indicators are significant predictors for a central outcome, there is apparently no effect of social capital. If one, or some of these indicators are significant predictors, social capital is productive and goal specific – productivity then results from knowing the *right* people. If all of these indicators prove significant predictors for an outcome with comparable magnitudes, there is a very unspecific effect of social capital – the effect may then result from knowing *enough* people.

There are two ways to deal with this problem. A first solution is the conversion of various "social resources" into a single currency – this is the basis of the "position generator" measurement model, where social resources are expressed as the job-specific prestige of network members' occupations (see section "position generator"). A second option is to use some form of concretely listed, potentially useful social resources. Starting from a theoretical classification, for each capital collection some useful examples can be the basis for questionnaire items. This is the basis for the "resource generator" measurement instrument, which is explained in a separate section below.

## 2.3. Instruments

The translation of theoretical presumptions about social capital measurement into questionnaire items meets with the problem that a general perspective on the wording of questions needs to be chosen. When we wish to understand the role of social capital in attaining outcomes at the personal level, it is important to distinguish between accessing and mobilizing social capital (Flap, 2004; Lin, 1999a) – after all, not all potentially accessed social capital is mobilized, and furthermore, asking respondents questions about whether they could access social resources versus whether they have used social resources potentially retrieves very different answers. Both ways of questioning bring along specific measurement problems.

When we ask questions about having *access* to certain social resources (such as the questions listed in Table 2.1), the quality of the data remains rather hypothetical. Answers to such questions may contain considerable unreliability, and in case of social capital, social desirability.[7] In addition, unused social capital is probably not as well memorized as used social capital – people who actively use their networks will more clearly remember the contents of their networks. Moreover, of many resources people do not know whether they are owned by personal network members, because they are context specific, not commonly encountered in social exchange, or knowledge about them is limited to intimate confidents. Furthermore, as discussed earlier (see section "volume") measurement of a collection of unused social capital points towards superfluous measurements, because most of the potentially accessed social capital will never be used.[8] In predictive analyses, this eventually reduces amounts of explained variance in productivity and goal specificity questions.

Other, but more serious problems are encountered when we would ask respondents questions about the *mobilization* of resources only. Questions about the use of help from network members operate from a retrospective time perspective by definition. This introduces the need for a pre-specified time frame (e.g. use in the

TABLE 2.1. Empirically determined domain specific cumulative social capital measurement scales for UK sample, based on a resource generator with stem question "Do you personally know anyone with the skill or resource listed below that you are able to gain access to *within one week* if you needed it?" (N = 295; sample of south London and Doncaster electoral registers); popularity and scale fit of individual items and scale diagnostics.

| Do you know anyone who.....? Domestic resources | % "yes" | $H_i^a$ |
|---|---|---|
| A17 – knows a lot about DIY | 84 | 0.40 |
| B3 – help you to move or dispose of bulky items | 81 | 0.43 |
| B4 – help you with small jobs around the house | 88 | 0.58 |
| B14 – get you cheap goods or "bargains" | 53 | 0.54 |
| B15 – help you to find somewhere to live if you had to move home | 65 | 0.56 |
| B16 – lend you a large amount of money | 46 | 0.59 |
| B17 – look after your home or pets if you go away | 86 | 0.51 |

$n = 276$, $H^b = 0.52$, $\rho^c = 0.78$

| Expert advice | % "yes" | $H_i$ |
|---|---|---|
| A7 – has a professional occupation | 88 | 0.60 |
| A12 – knows a lot about government regulations | 43 | 0.58 |
| A13 – has good contacts with the local newspaper, radio or t.v. | 18 | 0.46 |
| B1 – give you sound advice about money problems | 70 | 0.49 |
| B2 – give you sound advice on problems at work | 70 | 0.58 |
| B8 – give you careers advice | 50 | 0.52 |
| B9 – discuss politics with you | 59 | 0.52 |
| B10 – give you sound legal advice | 55 | 0.49 |
| B11 – give you a good reference for a job | 85 | 0.61 |

$n$  266, $H = 0.54$, $\rho = 0.83$

| Personal skills | % "yes" | $H_i$ |
|---|---|---|
| A1 – can repair a broken-down car | 72 | 0.34 |
| A3 – is a reliable tradesman | 76 | 0.39 |
| A6 – is good at gardening | 83 | 0.45 |
| A9 – works for the local council | 43 | 0.32 |
| A11 – can sometimes employ people | 56 | 0.36 |
| A15 – knows a lot about health and fitness | 65 | 0.36 |

$n$  279, $H = 0.37$, $\rho = 0.69$

| Problem solving resources | % "yes" | $H_i$ |
|---|---|---|
| A4 – can speak another language | 60 | 0.45 |
| A5 – knows how to fix problems with computers | 77 | 0.39 |
| A8 – is a local councillor | 23 | 0.54 |
| B5 – do your shopping if you are ill | 90 | 0.34 |
| B7 – lend you a small amount of money | 90 | 0.41 |

$n$  281, $H$  0.42, $\rho$  0.60

a,b H overingers homogeneity index indicating individual item fit in scale ($H_i$) and scale homogeneity ($H$) (see text)

c Scale reliability index as calculated by software MSP5 for windows

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last three or six months), and may result in unreliability of data in terms of specific memory effects. In addition, the action of using social capital is an outcome of a decision process that is influenced by personal wealth (e.g. more wealth could make social capital less useful), the individual need for help in general (e.g. being of old age or ill health increases the need for support), and one's personality, including an individual's propensity to ask for assistance. Therefore, information about the use of social capital is not only unreliable to some extent, but also confounded by many other important variables.

In comparison, the mobilization perspective seems more problematic than the access perspective (Van der Gaag & Snijders, 2004). Therefore, we advise investigators to use highly standardized versions of questionnaires using the access perspective. Perhaps ideally, social capital measurement instruments would include questions from both perspectives; however, time and resources will often prevent inclusion in questionnaires. The development of social capital questionnaire forms has largely followed three models, which can all be adapted to both the access and use perspective on social capital.

### 2.3.1. Name Generator

The oldest measurement tool for individual social capital stems from 1970s social network research. It comprises an extensive social network inventory performed with a combination of "name generator" and "name interpreter" questions. Originally designed for the estimation of social network size, and the identification of social network structure and contents, the method comprises two or three rounds of data collection. In the first "name generator" part, a systematic list of queries asks the respondent to mention names of persons he or she knows, which are recorded by an interviewer. A second, "name interpreter" part collects information about all alters listed in the first part, comprising the relationships with the focal individual and alter attributes, among which questions about any social resources embedded in these relationships. (A third, optional round is sometimes added to assess existing relationships between alters; for an example, see Flap, Völker, Snijders, & Van der Gaag, 2004).

This procedure was the main method of social capital data collection until the mid 1990s and still is the staple instrument for studies of social network structure. While various types of name generating questions have been tested (e.g. Van Sonderen, Ormel, Brilman, & Van Linden van den Heuvell, 1990), the "exchange" type name generator proposed by McCallister and Fischer (1978) was eventually most widely used; its most famous example is the single "core"-network identifying item "with whom do you talk about personal matters?", recurrent in annual rounds of the US General Social Survey (Burt, 1984; Marsden, 1987; for various early forms see Marsden, 1990).

For social capital research, the name generator / interpreter combination can provide very detailed social network and social capital information. It is the only social capital measurement instrument that identifies single alters and their various attributes, which enables the study of individual network structure,

relationship-specific attributes and relationship multiplexity – research issues closely related to social capital. The wealth of possible information collected with this tool has also led to an abundance of differently calculated social capital measures (see section "measures").

The costs of data collection with name generators can be high. Dependent on the limits set to the allowed number of alters to be mentioned in response to each question, interviews can become lengthy and repetitive when large networks are encountered, and many interpretative (such as social capital) questions are added. Even though this specific part of the information is usually later deleted, some respondents also become suspicious when asked to identify their network members. Moreover, the central idea of making a complete resource inventory of individual social networks theoretically retrieves much superfluous data (see section "volume"). The flexibility of the design of name generator / interpreter sets has led to many different versions. Although several name generator questions have become relatively standardized, there is no general agreement on which questions to include for alter identification in social capital studies. Therefore, results of social capital studies using name generators are often difficult to compare.

### 2.3.2. Position Generator

A measurement method focusing more on the presence of social resources than relationships in networks is the "position generator" (Lin & Dumin, 1986; Lin, Fu, & Hsung, 2001) – an instrument deliberately designed to cover social capital in the "general" life of the modern Western individual, without considering specific areas of goal attainment, life domains, or subpopulations. A position generator typically asks about a systematic list of 10–30 different occupations whether the respondent "knows" anyone having this occupation; subsequently, it is checked whether people in these positions are known as family members, friends, and acquaintances. Social capital data from the position generator are based on the idea that the occupations of network members represent social resource collections that can be quantified with job prestige measures. Based on a model of an hierarchically modeled society, following Lin's theories of social resources and social capital (Lin, 1982, 2001), the most important underlying assumptions of this measurement model are that having access to persons with high-prestige occupations gives 1) access to large resource collections, and 2) such alters may exert important influence in their (second-order) social networks.

The position generator instrument has been consistently applied in research since its first publication, and has gradually become a popular measurement instrument in individual social capital research (for an overview of recent research see Lin & Erickson, forthcoming). The construction of social capital measures from position generator data has developed into largely standardized sets; three measures directly derived from Lin's social capital propositions (Lin, 2001:61-63) are most frequently used in research: *highest accessed prestige* is an indicator based on the hypothesis that accessing high prestige network members leads to the generation of higher returns (Lin, 2001:62). Two other position

generator measures are indicators of beneficial diversity (see "measures"): *range in accessed prestige* is calculated as the difference in prestige between the highest and lowest occupation accessed, while *number of different positions accessed* is the total number of different occupations in which a respondent knows anyone.[9]

Because it takes much less interview time than sets of name generators and name interpreters, the position generator is more respondent-friendly. Moreover, since this measurement model is firmly rooted in theory, the logic and theoretical rigor behind its operationalization enables a systematic development of versions for every society in which occupations, occupational prestige or job-related socioeconomic indices have been catalogued. These characteristics make the instrument appealing for systematic comparisons of returns to social capital between populations. However, although its aim is to be "content free" (Lin, Fu, & Hsung, 2001), position generator data rather emphasize the identification of social capital productive for instrumental use: accessing social prestige is not relevant for every social capital question (e.g. receiving emotional support from a surgeon is not better than from a cleaner), and alters without any identifiable job prestige can still be very relevant and useful social capital (e.g. home-makers have no official occupation or job prestige, but are essential network members to many people) (Van der Gaag, Snijders, & Flap, forthcoming). Especially when applied in the domain of health studies, the validity of position generator data may therefore show some systematic shortcomings.

Using position generator data for research into the goal specificity of social capital is difficult. The amalgamation of social resources into social prestige measures prevents the design of multiple indicators that each refer to specific social resource collections. One way to construct more specific indicators is to establish separate indicators for the financial and cultural resources attached to each of the included occupations, which can subsequently be used as social capital sub-dimensions (see dimensional analyses in Flap & Völker, 2001; Webber, 2007). Another is to specify the positions for male and female network members separately (Erickson, 2004).[10]

Position generator data are liable to some problems regarding their validity and reliability. Ideally, respondents say "yes" to included positions because they actually know someone in a specified occupation. However, respondents can also do so when this occupation only somewhat resembles the occupation of someone they know,

while both could be rated at various levels of job prestige (e.g. "community worker", "civil servant", and "member of armed forces") (Webber, 2007). "False positive" answers can be given when people interacted with only professionally are mistaken for personal network members (e.g. teachers, doctors, members of clergy, sales people, and directors of firms should not be included as positions). Some occupations may sound too salient to confess not to know anyone having it (e.g. artists or managers) while this is not the case. Some studies have shown that people are only vaguely aware of the actual professions of their network members (Laumann, 1969). Lower educated respondents sometimes do not fully understand the question asking to imagine occupations and "fill" them with people they actually know. In a recent UK validation study, participants were however found to unambiguously refer to persons they actually knew in specified occupations, which showed good to excellent test-retest reliability (Webber, 2007).[11]

### 2.3.3. Resource Generator

The "resource generator" (Snijders, 1999; Van der Gaag & Snijders, 2005) offers a new development in measuring social capital by using a "checklist": in an interview situation, access is checked against a list of useful and concrete social resources, for which exchange is considered acceptable (see Table 2.1). This method combines the economy of the position generator with the content validity of the name generator / interpreter method, because of its vivid measurement of social resources. In particular, when potential respondents are involved in the construction of the instrument, a valid list of relevant resources can be readily obtained and the questions can be phrased clearly to obtain a reliable response (Webber and Huxley, Submitted).

Some methodological issues need further study. While its data are concrete and its administration is quick, resource generator items have validity problems similar to the position generator – of many social resources it is unknown how much people actually know about their social network members. Furthermore, the inclusion of actual resource items in instruments is difficult to achieve with any theoretical rigor. The examples of social capital included in the instrument need to be potentially productive, exchangeable, acceptable to ask for, and memorable for the respondent. Since most of these characteristics are culturally dependent, developed versions of resource generator instruments are strongly bound to a specific population. Another problem proves to be that the popularity of the items is rather high: respondents very easily give an affirmative answer to questions whether they could access resources in their social networks; this also indicates susceptibility for socially desirable answers (Van der Gaag & Snijders, 2005).

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[9] Some of these measures show little variation in scores, especially when few items (<15) are included in the instrument. Less often used position generator measures without this disadvantage are the *average accessed prestige* (introduced by Campbell, Marsden, & Hurlbert, 1986), calculated as the mean of the prestige of all occupations in which the respondent knows anyone, and *total accessed prestige*, a social capital volume measure, calculated as the cumulative prestige of all accessed occupations (Boxman, Flap, & Weesie, 1992:47–48; Hsung & Hwang, 1992).

[10] A third method to construct more specific measures from position generator data is the performance of latent trait analyses on the sets of items (Van der Gaag, 2005:ch.6; Van der Gaag, Snijders, & Flap, 2006). This method is further explained in section "resource generator".

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[11] Occupations can also prove to be unsuitable for inclusion in a position generator because they are not very well known in the general population, such as "academic researcher", "laboratory technician", and "fishmonger" (Webber, 2007).

The construction of single social capital indicators from resource generator data can proceed in a theory-guided fashion (a single volume/diversity indicator can be constructed from its data as the sum score of access to all different items, whereas multiple indicators could be constructed for all sub domains included in its items), but the data are also suited for an empirical construction of measures (Van der Gaag & Snijders, 2005). This method comprises the construction of population-specific sets of multiple, domain-specific social capital measures by dimensional analysis of data. The idea behind this is that by checking the associations between all included items the latent structure of social capital is identified for a specific population, in which groups of strongly correlated items point towards the existence of separately accessed social capital domains. Since social capital data are typically of an ordinal nature, factor-analytic models such as e.g. Principal Components Analyses (designed for use with normally distributed data of at least 5 categories) are generally not suitable to accomplish such dimensional reductions. Instead, models from Item Response Theory are more appropriate (see e.g. Van der Linden & Hambleton, 1997).

The Resource Generator-UK (RG-UK) (Webber & Huxley, Submitted) provides a good example of such an analysis. The content validity of the items and questions for this instrument was established through a qualitative process of focus groups and an expert panel. This resulted in a pool of 35 usable social resources items which were used to explore the social capital domain structure of this population. Explorative analyses were performed using Mokken scaling (Mokken, 1997), a non-parametric item response theory method that aims to find robust and one-dimensional scales within sets of items. It begins by taking pairs of items with the strongest associations and continues by gradually including other well-fitting items until a scale has been formed that does not improve any further when other items are added.

Cumulative scale analyses was performed using MSP5 for Windows (Molenaar & Sijtsma, 2000). This uses Loevinger's $H$-coefficients (Loevinger, 1947) to express the fit of specific items within a scale and for the homogeneity of the scale as a whole. Uncorrelated items produce values of $H = 0$, whereas perfectly homogenous scales produce values of $H = 1$. Conventionally, scales with $H \geq 0.3$ are useful, $H \geq 0.4$ are medium strong and $H \geq 0.5$ are strong scales. The Mokken scaling method allows for each item to appear in only one scale. The procedure eliminates items that do not fit within any scale if their item homogeneity ($H_i$) falls below a set value, conventionally $H_i = 0.3$ (Mokken, 1997). Further, a reliability coefficient ($\rho$) is calculated for each scale. Values above 0.6 are conventionally taken as indications of sufficient reliability (Molenaar & Sijtsma, 2000).

Data for scaling and item reduction in the RG-UK was obtained from a postal pilot survey of individuals on the electoral register in south London and Doncaster in south Yorkshire (N = 295). The 27 items together form a homogeneous scale ($H = 0.37$) with high reliability ($\rho = 0.89$). The RG-UK scale and its sub-scales have good test-retest reliability (full validity and sample details are reported elsewhere) (Webber & Huxley, Submitted). Using explorative Mokken

scaling, four consistent internal domains were found within the instrument, each referring to a distinct dimension of an individual's social capital (Table 2.1). Firstly, the domestic resources scale refers to resources that may be required to assist daily living and improve one's living conditions. These are quite common resources with four of the seven being accessible to over 80% of this sample. Secondly, the expert advice scale contains skills that are important for the employment market or are associated with the domain of the professions. Empirically, this is the strongest scale ($H = 0.54$, $\rho = 0.83$). Thirdly, the personal skills scale draws together a range of attributes that are important for "getting the job done". It includes tradesmen, mechanics and gardeners, though a less obvious fit in this scale is someone who can employ others. Finally, a seemingly disparate group of items came together to form the problem solving resources scale. These could all be useful in difficult situations that could become very frustrating for individuals if they were not resolved.

Within-scale item correlations were positive and significant (Table 2.2). Table 2.2 groups the items within their scales in order of popularity, starting with the rarest resource in each scale. This shows that if one has access to someone who could lend a large amount of money (B16), one is more likely to have access to other resources within the domestic scale such as someone who could get cheap goods (B14) or could help one find somewhere to live if one had to move home (B15), for example. Similarly, if one knows someone with good contacts with the local media (A13) one is also likely to know someone knowledgeable about government regulations. The same is true for the other two scales. Moreover, since the scales have a cumulative character, individuals who have access to rare social resources are likely to also have access to more common social resources included in the same scale. Most of the items are correlated with items from other scales, though none is correlated with every other item. This is further evidence of the separate sub-domains of social capital that can be accessed through informal networks.

A further pilot tested for an association between these scales and common mental disorders such as depression and anxiety. Using postal questionnaires sent to a random sample of 1000 people on the electoral registers in the same two areas as mentioned above, 335 respondents completed the RG-UK and the twelve item General Health Questionnaire (GHQ) (Goldberg & Williams, 1988), a well validated self completed instrument that assesses the likely presence of a common mental disorder (further details reported elsewhere) (Webber & Huxley, Submitted). Further study of the distribution of social capital sub-domains across the population illustrate that increasing age result in diminishing access to expert advice. Occupational status is an important variable across all sub-domains except domestic resources. Additionally ethnicity and likely presence of a common mental disorder also appear to be important variables (Webber & Huxley, in press: Table3).

On the GHQ, 27.3% (n = 91) of the sample scored three or above, the threshold value for a probable common mental disorder. Table 2.3 indicates that looking after the home or being unemployed increase the odds of having a common mental disorder, whereas having a low status occupation appears to be a protective

TABLE 2.2. Inter-Item correlations of empirically determined resource generator scales (N = 295; sample of south London and Doncaster electoral registers).



Pearson correlations: p < 0.01, p < 0.05

TABLE 2.3. Logistic regression models with predictive factors for common mental disorder[a] including none, one general resource generator social capital sum score measure, and four domain specific social capital resource generator measures (N = 335, sample of south London and Doncaster electoral registers).

| Model | Variable | Odds ratio (95% CI) | p |
|---|---|---|---|
| **No social capital variables** | Looking after the home[1] | 6.11 (1.83–20.45) | 0.003 |
| $R^2 = 14.2\%$, $\chi^2(22) = 51.05$, p = 0.0004 | Unemployed[1] | 5.28 (1.04–26.80) | 0.044 |
| | SOC 7–9[1] | 0.18 (0.04–0.86) | 0.032 |
| **RG-UK total score** | Looking after the home[1] | 4.58 (1.30–16.09) | 0.018 |
| $R^2 = 17.3\%$, $\chi^2(23) = 51.80$, p = 0.0005 | Age | 0.96 (0.92–0.99) | 0.012 |
| | RG-UK total | 0.93 (0.87–0.99) | 0.029 |
| | SOC 7–9[1] | 0.18 (0.04–0.91) | 0.038 |
| **RG-UK sub-scales** | Looking after the home[1] | 5.54 (1.51–20.38) | 0.010 |
| $R^2 = 18.7\%$, $\chi^2(26) = 55.73$, p = 0.0006 | Age | 0.96 (0.93–0.99) | 0.017 |
| | SOC 7–9[1] | 0.19 (0.04–0.95) | 0.043 |

[1] Contrast group = SOC groups 1–3 (Office for National Statistics, 2000)

[a] Common mental disorder measured with twelve item General Health Questionnaire (GHQ) (Goldberg and Williams, 1988), GHQ; dichotomisation scoring under 3/3 +

Only variables significant at p<0.05 tabulated

factor in this sample. When access to social resources is included in the model, it becomes apparent that the volume or diversity of accessible social capital is a protective factor for mental health. However, when the total scale score is replaced by the four sub-domain scores, this effect disappears. This suggests that in this context social capital has an unspecific effect, and that having access to a diversity of social resources across all domains, resulting from having an extensive social network, is important for the prevention of mental disorder;.

As this data is cross-sectional it is not possible to determine the direction of any causal relationships between these variables. However, there are a number of possible explanations. An absolutely low level of resources may act as a vulnerability factor in the development of common mental disorder. Also, the loss of previously accessible and valued resources may increase vulnerability or act as a trigger for an episode. It is also possible that access to resources may diminish as common mental disorders persist, possibly as a result of diminished social interaction and exchange through social withdrawal.

Further work is underway in which the RG-UK is being used in a cohort study of people with depression in London. Studies of this nature will further our understanding of how access to social capital affects recovery or influences the chronicity of illness. The hypothesis being tested is that those with access to a larger number of resources will have a faster rate of recovery over a six month period. Early results

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from this study suggest that people access resources within their networks after the acute phase of illness has passed. These resources may assist recovery in a number of ways. In addition to the various forms of advice, help and support that can be obtained from informal social networks, people with chronic illnesses may improve their employment or promotion prospects by having more resourceful networks which, in turn, may assist recovery, for example (Webber, 2005). It will be instructive to learn how the different domains of social capital contribute to recovery.

## 2.4. Conclusion

Recent methodological research has shown that measures calculated from different social capital measurement instruments indicate very different aspects of social capital, and that separate measures from separate instruments also have different predictive value for different outcomes of social capital. Therefore, the selection of measurement instruments should be careful, and according to specific research interest, for which a general research strategy has been proposed (Van der Gaag, 2005:181–205; Van der Gaag & Snijders, 2003). Researchers are therefore advised to use two social capital measurement instruments in questionnaires whenever possible: one instrument aiming to measure the presence of specific social resources, which may identify social capital sub domains and illustrate the usefulness of particular resources (such as the resource generator), and one instrument that is more structurally comparable to other studies (preferably the position generator).

Social capital measurement instruments to be used in health studies ideally need extensive pre-testing to ensure their validity and reliability in the population being investigated. When effects of the presence of network structure or particular alters and/or relationships are not specifically investigated, studies including name generators are not recommended for reasons of efficiency. Resource generators work best if they are sufficiently large to contain a number of sub-domains of social capital so that specific groups of resources can be identified as influencing the outcome being studied. If specific resources are identified as useful in a particular population for preventing illness or enhancing recovery from it, more specific interventions can be designed to maximize the availability of, or access to, them.

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# The ABC-E Model of Emotion: a bio-psychosocial model for primary mental health care

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## Abstract

This paper highlights the social context of common mental disorders in primary care and the paucity of evidence relating to effective social interventions. It introduces the ABC-E Model of Emotion, which combines social interventions with psychological therapy, and discusses how the implementation of the new role of graduate primary care mental health worker (GPCMHW) provides an opportunity for holistic practice in helping individuals experiencing mild to moderate mental health difficulties in primary care. It provides a case example of the implementation of the ABC-E model and makes recommendations for further research including the evaluation of the model and GPCMHW training programmes.

## Key words

social interventions; bio-psychosocial model; graduate primary care mental health worker (GPCMHW)

## Introduction

In May 2007, Louis Appleby, the National Director for Mental Health in England, highlighted that social factors including employment, housing and social networks have equal importance to the biological and psychological treatments that people may traditionally receive for help with mental health problems (Appleby, 2007). In the context of implementing new roles in the mental health workforce (DoH, 2000; 2003a; 2004a) and widening access to psychological therapies for people experiencing common mental health problems, (DoH, 1996; 2001a; 2004b) this raises the important question of how an evidence-based rationale for the systematic integration of social interventions into primary mental health care provision can be developed.

The Department of Health has highlighted the need to adopt screening and assessment procedures leading to mental health interventions appropriate to meeting the needs of the primary care population (DoH, 2000; 1999). This imperative has been further directed by a range of guidelines that recommend integrating evidence-based psychological interventions such as cognitive behaviour therapy as an alternative, or adjunct, to biological treatments such as antidepressants and anxiolytic medication (McIntosh *et al*, 2004; NCCMH, 2004; Fletcher, 2005). However, the guidance fails to find a place for research evidence relating to the importance of social factors in the development and maintenance of individuals' mental health problems (SEU, 2004; ODPM, 2004; DoH, 2004c). Consequently, there has been a failure to articulate how the social, psychological and biological can be fully integrated into routine practice, including primary mental health care. Primary care practitioners need to be provided with the skills and competences that will enable them to work in a responsive and flexible manner, underpinned by an evidence-based bio-psychosocial model suitable for delivery within accessible primary care services (Boardman & Parsonage, 2005; Hague & Cohen, 2005).

This paper discusses the nature and role of social interventions within a stepped model of primary mental health care. It introduces the ABC-E Model of Emotion, which combines social interventions with psychological

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therapy, and discusses how the implementation of the new role of graduate primary care mental health worker (GPCMHW) (DoH, 2003b; Pidd, 2004) provides an opportunity for holistic practice in helping individuals experiencing mild to moderate mental health difficulties.

## The nature of mental health need in primary care and social problems

It is estimated that at any point in time one-sixth of the population will be experiencing a mental health problem (Appleby, 2007), and that around a third of people who go to see their general practitioner are experiencing a common mental disorder such as anxiety or depression (Goldberg & Goodyer, 2005). These difficulties can have a significant effect on life quality and occupational opportunities (Layard, 2004), and have significant cost for both individuals and communities (SCMH, 2003). In addition, there is increasing concern for the mental health of the ageing population (DoH, 2001b), and the effects that common mental disorder can have on individuals' ability to live with and manage the effects of long-term medical conditions (DoH, 2006).

Mental health problems are patterned by social class, gender and ethnicity (Pilgrim & Rogers, 2005; Rogers & Pilgrim, 2003). People of low socio-economic status are more vulnerable to common mental disorders, with a high prevalence associated with poor education, material disadvantage and unemployment (Fryers et al, 2003; Fryers et al, 2005). Exposure to environmental or social stress have long been known to cause depression (Brown & Harris, 1978). Further, recent analysis of longitudinal data suggests that socio-economic position can affect behaviour in childhood and adolescence, which impacts on subsequent adult psychological well-being (Schoon et al, 2003). Women experience a higher prevalence of depression and anxiety than men (ONS, 2000) and are more likely to seek help from their GP (Oliver et al, 2005). Although genetic explanations for this differential prevalence are proposed (Goldberg & Goodyer, 2005), social inequalities in gender roles cannot be ignored (Williams, 2005). Evidence about rates of common mental disorders among ethnic minorities is not consistent (ONS, 2000; Nazroo, 1997). However, inter-personal racism is associated with increased risk of common mental disorder in ethnic minority groups (Karlsen et al, 2005).

Additionally, attention has recently turned to the role of social capital in the aetiology of mental health problems (Webber, 2005; McKenzie & Harpham, 2006). Social capital refers to the social context of people's lives. It is a multidimensional concept that includes trust (Coleman, 1988), social norms and reciprocity (Putnam, 1993), features of social structures and networks (Lin, 2001) and the resources embedded within them (Bourdieu, 1986). A recent systematic review of the epidemiological literature found an inverse association between cognitive social capital (ie. trust) and common mental disorder at an individual level (DeSilva et al, 2005). Further, access to social resources within social networks is also inversely associated with common mental disorder (Webber & Huxley, 2007).

Social factors influence the course and treatment of depression. Socio-economic deprivation, negative life events, financial difficulties and not accessing health services all predict the persistence of depression in the general population (Viinamaki et al, 2006; Ostler et al, 2001; Skapinakis et al, 2006). A trial of medication adherence in primary care improved depression symptoms and medication adherence, but failed to reduce the number of relapses, which may have been caused by life events or other social factors (Katon et al, 2001). Together with evidence that social support reduces the onset of depression (Cassel, 1974; Brown et al, 1986) and precedes recovery (Brown et al, 1988; Leenstra et al, 1995), this suggests that alleviation of social stressors may facilitate better outcomes for people with common mental disorders. As common mental disorders are most frequently treated in primary care (Goldberg & Goodyer, 2005), it is perhaps more appropriate to focus attention on developing interventions there than in secondary or tertiary services.

## Social interventions in primary care

The role of current social circumstances such as poverty, social isolation or unemployment in the aetiology and course of common mental disorders is undoubted. However, few social interventions have been developed and tested, which minimise the impact of social problems on mental health in primary care. A review of interventions that could be delivered by GPCMHWs included four, which potentially embrace social models of mental distress, and lend some support to the model we are proposing here (Bower, 2002).

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First, a randomised controlled trial of befriending found it to be effective in remitting depressive symptoms in contrast to a waiting list control group among women recruited from primary care (Harris *et al*, 1999). An evaluation of the implementation of GPCMHWs in one inner city area, using semi-structured interviews and focus groups with GPCMHWs, primary care teams and patients indicated that the befriending aspects of the role were highly valued by patients (England & Lester, 2007). However, in order for GPCMHWs to fully embrace the befriending role, primary care trusts would need to extend the time limited interventions they are often restricted to and build some flexibility into their roles.

Second, individuals facilitating referrals between primary care and the voluntary sector were effective in improving some aspects of patients' functioning, including reducing anxiety symptoms and improving their ability to carry out everyday activities and their quality of life (Grant *et al*, 2000). An evaluation of a social prescribing scheme in south London, using semi-structured interviews, found a perceived reduction in patients' isolation and an increase in their self-esteem (Sykes, 2006). Although the results of a pilot evaluation are not yet available, Grayer and colleagues argue that GPCMHWs are able to facilitate access to the voluntary sector (Grayer *et al*, 2005).

Third, a review of self-help treatments such as bibliotherapy indicated some significant advantages in treatment outcome for anxiety and depression, though the evidence was limited in quantity and quality (Bower *et al*, 2001). Self-help treatments could be promoted by GPCMHWs to assist patients to identify social needs that may inform future intervention strategies.

Finally, a number of randomised controlled trials indicate that problem-solving is as effective in reducing symptoms of depression as antidepressant treatment (Kendrick *et al*, 2006; Mynors-Wallis *et al*, 2000; Dowrick *et al*, 2000). GPCMHWs are ideally placed to offer this treatment, which could resolve social or family issues that relieve episodes of depression or anxiety.

Implementation of GPCMHWs has varied across England (Harkness *et al*, 2005; Baguley *et al*, 2007), although early evidence of the beneficial impact on the services they work within is emerging (England & Lester, 2007; Farrand *et al*, 2007). The first trial of GPCMHWs has shown that they appear to be successful at improving patients' satisfaction with their episode of care, but having GPCMHWs within practices was not associated with a reduction in mental health symptoms (Lester *et al*, 2007). However, the articulation of the process of assessment, decision-making and execution of interventions as derived from a systematic patient centred formulation is still lacking. Further, trials with randomisation at the patient level are required to test the effectiveness of GPCMHWs intervention models such as the one being proposed here.

### The ABC-E Model of Emotion

The ABC-E Model of Emotion is a bio-psychosocial model of mental health care originating from the relationship between a person's emotional well-being and the context of their lives. It illustrates the vicious cycle of common mental health problems as well as providing a framework for interventions. Developed within the University of Manchester originally as the ABC Model of Emotion (Richards *et al*, 2002), it is underpinned by cognitive and behavioural models of emotional disorder (Lang, 1971; Beck 1979) and was adapted for the provision of facilitated self-help (Briddon *et al*, 2003). The model is central to the education and training of GPCMHWs at the University of Manchester and forms part of the MSc programme in primary mental health care.

### Components of the model – 'Autonomic, Behaviour, Cognition and Environment'

The ABC-E Model deconstructs a person's mental health problem into the following components:

Autonomic – physical effects of distress
Behaviour – changes in behaviour due to distress
Cognition – changes in patterns of thinking
Environment – environmental triggers, maintaining factors and social impact

By approaching the person as a bio-psychosocial system it becomes possible to strategically target interventions in one specific domain with the expectation that this will influence the whole system. This allows for the impact of the environment and the role of social interventions to be fully understood.

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## The environment

The environment is composed of physical, social and socio-political factors and provides the context for the ABC, emphasising the inter-relationship between emotion and the environment and facilitating goal setting that links to both.

### Theoretical underpinnings

The model is influenced by social capital theory, which is concerned with fostering social relationships and resourceful networks within the community (Webber, 2005). 'Bridging' and 'bonding' forms of social capital can guide a range of social interventions to promote recovery from mental illness (McKenzie, 2006). While the implications of this for the development of a bio-psychosocial model and social interventions is highly significant, there is recognition that the association of social capital with mental health is not yet firmly established (Webber, 2005; McKenzie & Harpham, 2006). Further, the impact of social exclusion on accessing social capital creates major challenges with regard to improving access to social interventions for people using primary mental health care.

## Applying the model in practice
### 1. Patient centred interviewing

Patient centred interviewing is a central component of the ABC-E Model of Emotion (Mead & Bower, 2000). As an alternative to medical interviewing in primary care, interventions are informed by the overt problem the client brings. The strength of this approach is that an individual's understanding of their mental health problem will often be broader than the narrow definition afforded by a diagnostic category. This is crucial to the development of appropriate goals for recovery and an intervention strategy.

Patient centred interviewing also emphasises the importance of using words given by the individual to describe their distress. These personal descriptors are mapped onto the formulation with the aim of developing a tool for recovery, which resonates with the client and can be used confidently outside of the clinical setting. Patient centredness also relies on an active partnership, which assumes both the clinician and client have knowledge and expertise to bring to the problem (Mead & Bower, 2000).

An important dimension of patient centredness and their social environment is the need to have a knowledge of the individual's context from their perspective (Tew, 2005). The influence of power differentials caused by stigma, inequality and discrimination also need to be considered (Tew, 2002). Likewise, the practitioner's awareness of their own values, beliefs and assumptions based on their own social and cultural context is crucial if they are going to maintain a strong alliance with the client and facilitate access to appropriate social interventions.

### 2. Assessment

In addition to patient centredness, the tools for assessment include a series of questions, many of which refer to the person's environment (see *box 1*). Interpersonal skills such as active listening, empathy, normalising, the use of summarising statements to check understanding, the ability to instil hope through the optimism and recognising the individual's potential for recovery are also important.

**Box 1: Key environment assessment questions**

While there are a range of questions that develop a picture of the individual's problem(s) within the bio-psychosocial model, questions that elicit relevant social factors include:

- What triggered your current problem?
- Is the problem better or worse with particular people or in particular situations?
- How is the problem impacting on your life (social, occupation, relationships, spiritual?)
- What have you been doing so far to cope? (What helps? What doesn't?)
- Is there anything that we haven't talked about that you think is relevant to your problem? (probe for social factors)

### 3. Problem formulation, shared decision-making and goal setting

The assessment is summarised in a verbal 'problem statement' and shared with the individual to check for accuracy. The ABC-E Model of Emotion can then be developed in collaboration with the client in order to

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achieve accuracy. Once complete, the map or formulation guides shared decision-making about various interventions, which may help break the cycle by impacting on either the physical, behavioural, cognitive or environmental components of the problem. At this point, short and long-term goals are set and prioritised.

### 4. Tools for monitoring and evaluation

The Social Inclusion Planner (SIP) was introduced as a means of measuring social roles and community participation (Bates & Dowson, 2006). While it is in its infancy and may require adaptation for primary care, SIP provides a means of auditing provision within localities and also can be used on an individual basis to help the individual map his/her own social network.

SIP maps out a baseline of inclusion across life domains for individuals, but it ascribes no meaning to the data collected. This is achieved through collaborative work involving the practitioner and the individual. In order to monitor change, individuals are asked to complete the planner again after the delivery of social interventions. SIP offers the potential to gather the breadth of data to support a bio-psychosocial model of care alongside other standardised outcome measures (Webber & Huxley, 2007; Evans *et al*, 2002; Spitzer *et al*, 1999; Mundt *et al*, 2002).

### 5. Social interventions

Mental health service users identify good relationships, enjoyable activities, financial security, satisfying work, personal growth and the development of self-management of problems as crucial to recovery (Wallcraft, 2002). Social interventions can facilitate these but as discussed above, there are few adequately evaluated. However, by developing a structured and patient centred approach to the delivery of interventions within stepped care (see *figure 1*), we have an opportunity to consider

Figure 1: Stepped care and social interventions

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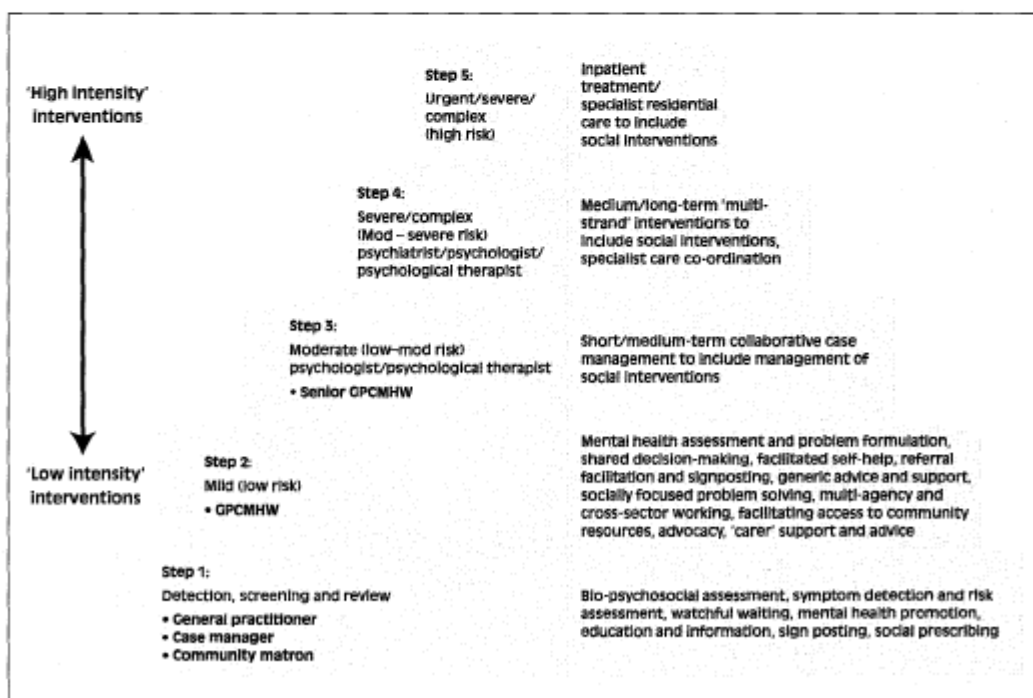
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the competences that practitioners working at each step require, as well as providing a framework for locating social interventions within primary mental health care.

## Socially focused problem solving
Specific skills such as problem solving (Mynors-Wallis *et al*, 2000) facilitate the process of selecting and accessing social interventions. Practitioners will either highlight these within the individual's existing range of coping mechanisms or work alongside the client to help develop them, so that particular skill sets become the individual's own to be used flexibly across a number of situations both currently and in the future.

## Building social capital and community mapping
In order to support the delivery of social interventions it is vital to broaden the perspective of primary care recognising the provision of services by community groups and third sector organisations, which may be more accessible than statutory provision. The skill of being able to map resources in order to effectively signpost and offer practical support to individuals is crucial in the delivery of social interventions.

Contributing to multi-agency and cross sector working acknowledges mental health as the responsibility of all, with services such as libraries and sports centres having an important role to play in the prevention and treatment of mental health problems (ODPM, 2004). By connecting to these agencies, developing joint projects and a working knowledge of local provision, GPCMHWs

can make a valid contribution to strategic planning across sectors and to broaden patient choice.

## Illustrative case example
The individual ('Kath') described in *box 2* is an individual at step 2 of the stepped care model. She has a number of social factors impacting on her mental health. The ABC-E Model guides shared decision-making, goal setting and the application of social interventions to promote Kath's recovery.

### Problem formulation (Stage 1)
The relevant assessment information is formulated within the ABC-E Model of Emotion to demonstrate the maintenance cycle and provide the context for shared decision-making and the selection of appropriate interventions (see *figure 2*, overleaf).

### Problem formulation (Stage 2)
Social, physical and psychological interventions are mapped onto the model in order to work towards the goals set in collaboration with Kath (see *figure 3*, overleaf).

## Outcomes
The ABC-E Model can facilitate either the delivery of single strand interventions such as social problem solving or a number of interventions simultaneously. For example, Kath and the practitioner worked to resolve her debt problem. Kath chose to telephone the debt advice line rather than speak face-to-face with an adviser because she

**Box 2: Case example – 'Kath'**

Kath (not her real name) is a lone parent with two children aged seven and 11 years. She has been experiencing problems with depression since her marriage ended two years ago. Both she and her daughters moved out of the family home at the time of separation and are now living in an area that is unfamiliar. Kath spends a large part of her day in the house. She doesn't know anybody in the area. She is finding it difficult to sleep at night so has 'naps' in the day, often returning to bed when the children go to school. She has very little energy and apart from some cleaning and washing she spends the remainder of her time watching TV. She has thoughts that she is a 'bad mum' and 'a useless person'. These thoughts have troubled her for the last 12 months. Since the divorce Kath has struggled financially. While married, her husband would manage the family budget, a job which Kath now finds extremely difficult to cope with on her own. Consequently, she has accumulated debts and has stopped opening letters for fear of what might be in them. Kath has a visit once a week from her mother who lives a distance away but finds contact with her very stressful. Kath feels very ashamed that she is in such a difficult financial situation and feels inadequate whenever speaking to her mother, often getting into arguments with her over 'silly things'. Kath is also 'picking at' the children, which she feels very guilty about. She hasn't experienced suicidal thoughts but often wishes she 'didn't have to wake up'.

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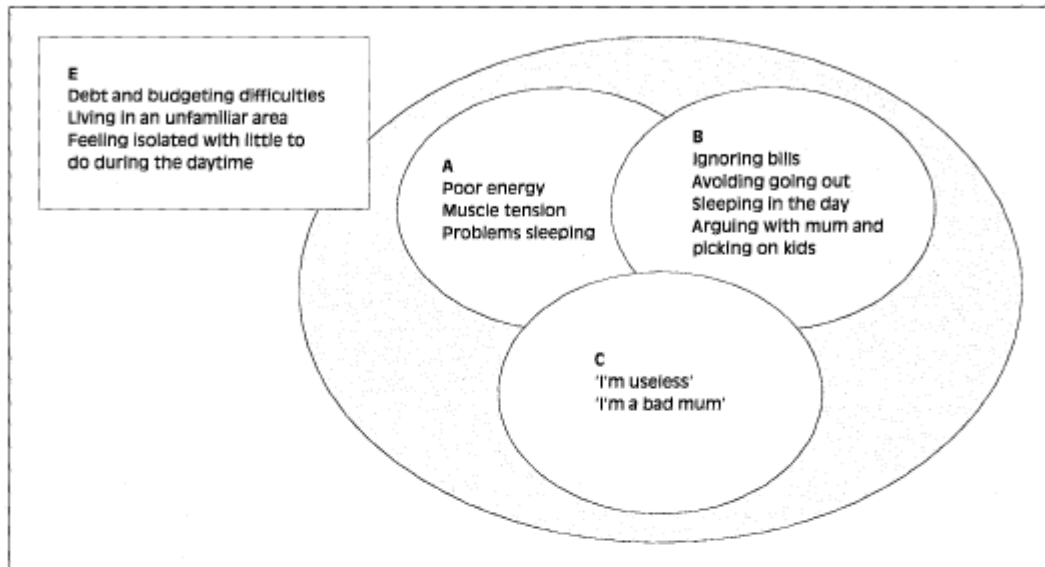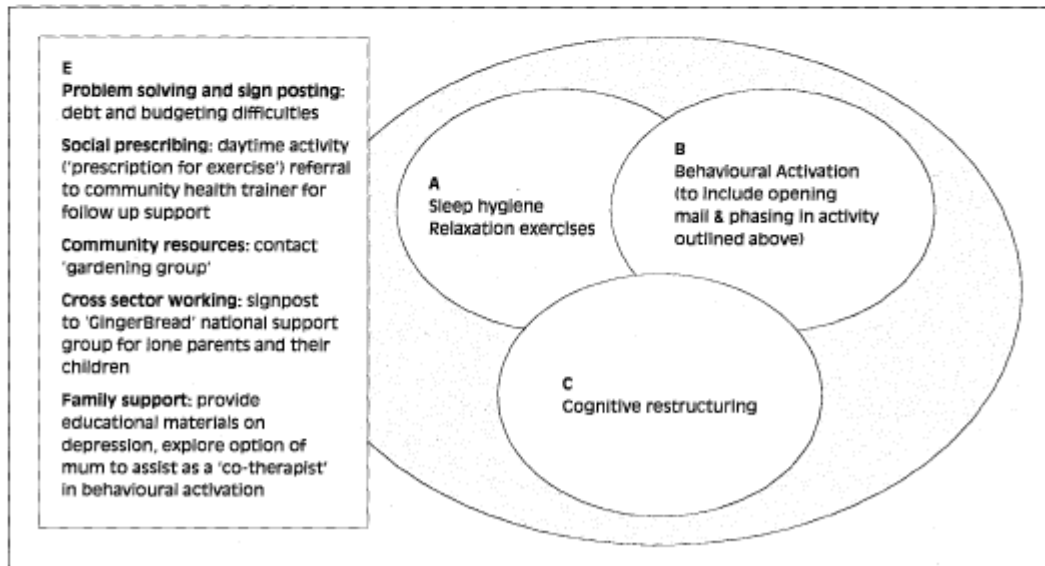
**Figure 2: ABC-E Model of Emotion applied to 'Kath'**



E
Debt and budgeting difficulties
Living in an unfamiliar area
Feeling isolated with little to
do during the daytime

A
Poor energy
Muscle tension
Problems sleeping

B
Ignoring bills
Avoiding going out
Sleeping in the day
Arguing with mum and
picking on kids

C
'I'm useless'
'I'm a bad mum'

**Figure 3: ABC-E Model of Emotion: bio-psychosocial interventions**



E
**Problem solving and sign posting:**
debt and budgeting difficulties

**Social prescribing:** daytime activity
('prescription for exercise') referral
to community health trainer for
follow up support

**Community resources:** contact
'gardening group'

**Cross sector working:** signpost
to 'GingerBread' national support
group for lone parents and their
children

**Family support:** provide
educational materials on
depression, explore option of
mum to assist as a 'co-therapist'
in behavioural activation

A
Sleep hygiene
Relaxation exercises

B
Behavioural Activation
(to include opening
mail & phasing in activity
outlined above)

C
Cognitive restructuring

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lacked confidence. In recognising the undermining effects of Kath's low self-esteem on problem solving, and in the long-term accessing help to receive advice for budgeting, Kath and her practitioner agreed to simultaneously work on cognitive restructuring to improve her self-esteem.

To achieve the goal of going out and mixing with people the SIP was useful in highlighting the life domains that had changed significantly since Kath's divorce. Kath decided to get involved in an activity that would help her to meet other adults with similar interests. The practitioner signposted her to the community health trainer, who provided her with information on local groups, including a gardening group. In order to work towards attendance at the group, behavioural activation was introduced to add structure to her week, beginning with routine activity, which combined domestic chores and pleasurable pastimes, slowly building towards a visit to the gardening group. Cognitive restructuring continued alongside behavioural activation to help Kath manage negative patterns of thinking that could serve to undermine her progress. The SIP was repeated at review appointments and the life domains prioritised by Kath were built upon.

By making progress in these two key areas Kath reported improvements to her mood, as evidenced by standardised measures repeated at the point of review. As a consequence, her relationship with her children and mother became less fraught. Also, by attending the gardening group Kath met a mother with children of a similar age to her own and they began to spend time together.

At the point of discharge a relapse prevention plan was agreed, which highlighted the outcome of each goal, the tools that had facilitated change, early indicators that might suggest the problem was returning and an emergency plan to intervene at the first opportunity or seek help promptly. A copy of this was given to Kath and kept alongside other materials such as the SIP, thought diaries and behavioural activation timetable. The model and range of interventions were recommended as tools for living to be applied across situations to maintain well-being and support recovery.

## Conclusion

This case study illustrates the role of social circumstances in the development and maintenance of mental health problems. Although the evidence to support this relationship is in no doubt, there is a paucity of research on the application of social capital theory and the effectiveness and acceptability of social interventions within primary mental health care.

A full evaluation of the ABC-E Model, including an evaluation of the process of assessment, problem formulation, goal setting, shared decision-making, and the social interventions themselves, is urgently required. Also, the role of social interventions alongside the psychological and biological in an integrated model of care, which has the versatility to respond in a step wise way to a range of problems commonly encountered in primary mental health care practice, needs to be explored further. Finally, the training of GPCMHWs to effectively deliver this model needs further enquiry and evaluation.

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