For whom money matters less: patterns of connectedness and psychosocial resilience

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Abstract

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For whom money matters less: patterns of connectedness and psychosocial resilience

The positive association between income and subjective well-being (SWB) is undisputed; there remains scope, however, to expand our understanding of the explanatory mechanisms at work. The theoretical framing is formed from economics and psychology which have been the traditional homes of happiness research. However, the stance taken here is sociological in its attention to social networks and social status. I also emphasise *psychological benefits* as an explanatory mechanism for the money-happiness relationship. Following Layard (1981) and Easterlin (2001), it is posited that above the level at which basic needs are met, higher SWB results from the higher rank in society that money brings. I argue that rank and status inform how individuals feel about themselves (self-esteem, self-worth) and their environment (perceived control) and that it is these factors that bring about SWB. Furthermore, social connectedness is an alternative source of these benefits and it is thus hypothesised that connectedness will intervene in the money-happiness relationship. Secondary or "weak" ties are expected to have an additional and separable effect to close ties alone. I use the term *resilience* as a framing concept as it allows the stressor (financial situation) and outcome (SWB) to be discussed in a single term.

The thesis has three empirical aims. The first is to determine whether connectedness influences the money happiness relationship, where 'money' refers to household income, perceived financial situation and being worse off than the previous year. Secondly, I aim to separate the effect of connectedness from the effect of personal characteristics by observing outcomes before and after a change in connectedness. Third, I aim to unravel the potentially paradoxical role of networks for those on low incomes as both a resilience resource and therefore greater happiness, and as a source of wider social comparison and therefore greater *un*happiness.

I use data from seven waves of the British Household Panel Survey. A latent class analysis establishes a measurement schema of connectedness based on strong and weak ties. Growth curve models are used to measure the effect of money on SWB and differential effects by connectedness are demonstrated with interaction terms. Resilience before and after network changes are explored using multiple group linear regression at two time points, and neighbourhood social comparison is examined in multilevel models. The findings are that income has no bearing on the SWB of the socially-integrated (those with both strong and weak ties) while the isolated have a lot to gain. The SWB of the integrated does suffer in difficult financial circumstances as subjectively reported but less so than the isolated or those with only strong ties. Further, when individuals expand their network it is accompanied by a decrease in the importance of income for SWB. These patterns can in part be explained by the fact that the SWB of the well-connected is less influenced by their position *relative* to those living around them, at least where the income gap is not too large. Therefore, the assumption of happiness as a zero-sum game is mistaken; social comparison is not inevitable and SWB can be maintained through social integration providing the level of inequality is not too high.

Declaration

No portion of the work referred to in this thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

Copyright statement

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Publications

Sections of the theoretical framework and empirical work from Chapters Four and Five have recently been published as an article in the journal *Social Indicators Research*.

Richards, L. (2015). "For Whom Money Matters Less: Social Connectedness as a Resilience Resource in the UK." Social Indicators Research: 1-27.

Chapter 1. Introduction

"The main aim of social science", writes Layard (2012a), "should be to throw light on the conditions conducive to happiness". This thesis is a study of happiness that aims to further this cause by highlighting the complexity lurking behind simple correlative relationships that have already emerged from the science of happiness. Specifically, this study sets out to show that the money-happiness relationship is contingent upon the social setting, and is thus a sociological 'take' on an economics question. The theoretical background to the study is formed mainly from economics and psychology, these being the traditional homes of empirical happiness research.

The science of happiness is not without criticism. Cieslik (2014), for example, describes notable sociological critiques in which popular culture is described as 'happiness-fixated' reflecting the individualism and consumerism that defines modern society. Further, the existing literature on happiness is criticised as often being both reductionist and normative, a point relating particularly to quantitative accounts that are deemed unable to capture the complex ways in which happiness is experienced. The methods used in this study are also quantitative, and I make no strong claims about avoiding reductionism. However, some of these concerns are addressed. Firstly, the analytical approach allows for empirical complexity in the form of interactions that show that the money-happiness relationship plays out differently for different groups, and therefore begins to disentangle the complex lived experiences of happiness. Secondly, although this study does not directly engage with debates around the individualism and consumerism of our society, it shows that social engagement matters. In other words, though society may be labelled as individualistic, I show that social activity within the wider collective is commonplace and that it exerts an important influence on the money-happiness relationship.

Along with connectedness, this study also attends to associated psychological processes including social approval, status-seeking, the degree of control we feel over our lives, and social comparison as explanatory mechanisms. Emphasis is placed on the interaction of the psychological and the economic with the given social environment and of the perceived self within that social setting. The social setting is considered in this study in two forms expanded on at length in chapters to come: the personal social network with whom individuals interact, and the neighbourhood setting in which individuals and their personal networks are sited.

1.1 Well-being: beyond GDP

In his seminal study published in 1973, Easterlin demonstrated that increases in wealth over time do not bring about corresponding increases in well-being at the societal level. This was among the first demonstrations of how social context has a bearing in the study of happiness. It also showed that conflating economic indicators with quality of life is fundamentally flawed, a truth that has worked its way into the political agenda. This movement, though perhaps most strongly associated with the announcement by the UK Coalition Government in 2010, largely transcends the left-right cleavage in British politics (Bache and Reardon 2013) and can be traced back at least a decade. Well-being was included as a specific objective in public service agreements in the Department for Work and Pensions and the Department of Health among others in 2007, and the Department for Environment, Food and Rural Affairs made a commitment to explore well-being in 2005 (Lepper and McAndrew 2008). The idea of measuring well-being is a cross-national movement echoed in the OECDs Better Life Index, the EU's GDP and Beyond, and the influential Stiglitz report which made the recommendation to attend to the "emotional prosperity" of nations (Oswald 2010).

1.1.1 National well-being

In the Budget Report of 2010, the Government stated their commitment to developing broad indicators of well-being and sustainability and these measures serve the purpose both of monitoring progress (much as GDP has been used), and for informing and evaluating policy (Dolan et al. 2011). The intention then, is not simply to measure and watch well-being but to use the measurements to shape policy, and for policy to shape the well-being of individuals. This thesis is a contribution to the 'debate about what really matters' and therefore it follows that the findings of this research can, in theory, be used to inform policy that in turn will influence well-being. To measure well-being the Office for National Statistics (ONS) developed ten dimensions for measurement, four of which are central to this research. They are: 1) *personal well-being*, which goes under the name of 'subjective well-being' or 'happiness' elsewhere. The second item (2) is *our relationships* which includes social support and satisfaction with family and social life. The final two important domains relate to economic circumstances and are 3) *personal finance* where well-being is assessed by measuring the percentage living below the poverty line (60% of median income) and a subjective appraisal of 'finding things difficult'; and 4) is *the economy* where well-being is demonstrated by real household actual income per head as well as national measures. The other domains are: what we do, where we live, education, governance, the environment, and health.

Within this measurement schema, personal or subjective well-being is conceptualised as the ultimate good, which is to say that all the other domains are considered as instrumental means to achieve personal well-being. There are several possible consequences of this dimensional approach to well-being that require consideration from both an academic and a policy perspective. Firstly, all the domains are treated equally, with, for example, personal finance assumed to have equal weight to personal relationships as contributors to happiness. In contrast, research has shown some domains to be more important than others with satisfaction with aspects of social life having higher correlations with life satisfaction than other domains (Peasgood 2008). Secondly, in this model of well-being, the domains are treated as separate pieces of a puzzle which slot together to produce a complete and rounded depiction of happiness. However, these domains are not distinct, mutually exclusive categories, but may overlap and interact.

This study places the spotlight on three domains: social relations, personal finances and subjective well-being and sets out to show the complex interdependencies between these areas of life. In doing so, it demonstrates that the domain measures and targets cannot be treated as a 'recipe' for happiness. It will highlight the unequal distribution of the experience of financial stress, with the costs to some being far greater than the costs to others in terms of their subjective well-being.

The lasting change to the economic landscape after 2008 forms an inevitable backdrop against which to consider the implications of this study. For example, the local authority spending reductions resulting from austerity measures are likely to be detrimental to voluntary schemes, charitable organisations, public spaces and local groups and events (Hastings et al. 2013; Lowndes and Pratchett 2012), all of which provide space for community engagement, for social connections to wide-ranging "others", and therefore for social integration.

1.2 Resilience

The term resilience is used a framing concept in this thesis. Its advantage is partly a semantic one as the term inherently refers to both the outcome and stressor. As a tool for well-being research it brings dynamic processes into focus and promotes extension beyond simple cross-sectional correlations. Instead it guides research towards an understanding of the mechanisms which allow some people to maintain good psychological well-being despite hardship, while others suffer.

Conceptually, and empirically for many researchers in the area, resilience is process-oriented, which is to say that attention is given to the inputs and outcomes of a process of coping, managing or adapting. Generally, the study of subjective well-being fits well into this framework. It is an outcome that is subject to fluctuations influenced by mood changes and longer-term situational factors (Argyle 2001; Diener et al. 1999). The 'set-point' to which happiness returns after an event is analogous to the concept of 'equilibrium' used in resilience research in the natural sciences (e.g. Holling 1996). Resilience and well-being operate in similar semantic fields and make use of terms such as *adaptation*, *buffering* and *recovery*. Both fields of study benefit from applying time-series methods in which before and after measurements can be taken and viewed in relation to individual attributes, context and circumstances. In light of government attention to National Well-Being, a resilience approach may prove to be of greater policy relevance. It shifts the focus from the difficult circumstances which make people unhappy, and instead emphasises factors with a buffering effect that may help explain how happiness can be maintained against the odds, or at least how unhappiness can be minimised.

Using some of the works from psychology and child development where it originated as a social science term, this section defines and operationalises 'resilience' as it will be applied throughout the thesis. The main focus in this exploration of the (mostly) psychological literature that follows is not on the findings of previous research but on the conceptual clarity that this work provides. The aim is to take advantage of the literature so that conceptual pitfalls can be avoided in using 'resilience' as a framework for exploring well-being and financial circumstances within different social environments.

1.2.1 A brief background to resilience: conceptual and empirical

The concept of resilience has been used in diverse fields. In the field of ecology, for example, in which the concept was well-established before it reached the social sciences, resilience has been defined as "the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and

feedbacks." (Walker et al. 2004, p.2). In contrast is the following simple but not atypical definition from psychology: resilience is "successful adaptation to adversity" (Zautra et al. 2010, p. 4). These definitions represent a gulf between academic disciplines in terms of conceptualisation and measurement. In the ecosystem, the level of resilience is determined by the level of disturbance that can be withstood where features of the external shock serve as the key indicator. It also implies that the outward signal of resilience is "no change", as the moment that change does occur to functioning then a resiliency threshold has been passed. In contrast, the psychology definition given above is pinned to the concept of 'adaptation' which is to say that some change to functioning is assumed to occur and success is indicated by a return to normal.

Within psychology, the original application of the term was in studies of disadvantaged children such as those by Garmezy and Rutter in the 1970s onwards (Reich et al. 2010). Garmezy (1991), for example, researched children who are exposed to risk factors such as poverty and growing up with a single parent where a lack of mal-development is the indicator of resilience. Here, like in Hollings' ecosystem, it is the absence of change and continuation of functioning which highlights resilience. Others follow, such as Bonanno (2004) who defines resilience as "the ability to *maintain* a stable equilibrium" in the context of bereavement (p. 20, emphasis added). Similarly, Boerner et al. (2010) discuss "the maintenance of well-being and functioning despite setbacks" (p. 128). Ong et al. (2010) allow for both possibilities of maintenance or adaptation (i.e. no change, or temporary change) through the inclusion of an *expected response* where resilience is defined as "adaptation that is substantially better than would be expected given the exposure to significant risk" (p. 82). Zimmerman and Brenner (2010), in the context of adolescents growing up in poor neighbourhoods note that resilience is demonstrated through "the *reduction* of risk effects, not their complete elimination" (p. 285, emphasis added).

In the main, the common applications of resilience can be summarised into three classes: 1) desirable outcomes for those at heightened risk of an undesirable outcome, 2) maintenance of positive functioning despite the presence of stressors, and 3) a return to normal after a temporary decline in functioning after an adverse event or shock (Masten et al. 1990). These classes have in common the presence of adversity in some form, as a shock or stressor, and a key outcome which is potentially affected by that stressor. The applications differ in terms of the cut-off levels or definitions of the outcome, negative influence and temporality.

Resilience is commonly considered a trait, an attribute or cluster of attributes of the person or community under scrutiny. This has intuitive appeal and is frequently applied in policy documents and the media as well as academic research. The government report into the riots of summer 2011, for example, treats resilience as synonymous with 'grit' and 'character' (Riots Panel 2012). Despite the frequency of application the 'trait model' is often rejected in academic research, however. Instead, a 'process model' offers a conceptual advantage in encouraging attention to the dynamic process of adaptation to adversity as well as to the dependence upon context and resources (Cicchetti and Garmezy 1993; Masten et al. 1990). The process model allows resilience to be inconsistent across situations or roles, to develop throughout the life course, and for variation in short-term and long-term outcomes (Masten and Wright 2010). This stands out in contrast to, for example, personality traits, often linked to resilience, which are assumed to be largely stable (Mayer and Faber 2010; Mccrae and Costa 1991).

Features of personality do, however, remain central to resilience research in psychology. Rather than being a direct indicator or parallel construct, they can be conceptualised as *protective factors* (Rutter 1985; Ong et al. 2010) or *resilience resources* (Smith et al. 2008) and are characteristics which increase the probability of positive adaptation, which is to say that they increase the level of resilience. A range of personality traits serve as resilience resources, including agreeableness, extraversion, emotional expressiveness, and self-esteem (Skodol 2010; Pallant and Lae 2002; Bolger 1990). Further psychological resources include competence, intelligence and motivation (Zimmerman and Brenner 2010), sense of purpose and personal agency, and the "ability to see the silver lining" (Zautra et al. 2010, p. 4). As well as these internal psychological factors, external or environmental resources have been demonstrated in the field of child development including social support, youth groups, and adult role models (Garmezy 1991).

1.2.2 Study designs for resilience

Empirical approaches have included qualitative and quantitative methods using both cross-sectional and longitudinal designs. Kobasa's (1982) study of the 'hardy personality' is a well-known example of a cross-sectional design in which interviews and psychological testing were carried out on groups of lawyers and other executives. Through the completion of health and stress scales, the subjects were categorised as having high or low stress and as having high or low illness. The resilient, 'hardy' types were those experiencing high stress but without illness and as such are an example of 'class 2' type resilience in which functioning is maintained despite the presence of stressors. A conceptually similar approach is that of the 'Hispanic

paradox' where epidemiological data suggest that people of Hispanic origin have better health outcomes in terms of infant mortality and life expectancy than would be expected given their socioeconomic status (Markides and Coreil 1986). The salient point exemplified here is that resilience is determined through a combination of circumstance and outcome. Without the presence of a stressor, positive outcomes do not indicate resilience. "Doing well in life…does not define resilience, nor does the adverse experience in and of itself" (Masten and Wright, 2010, p. 216).

A less well-established take on resilience is the direct and subjective method in which subjects are asked to rate their own functioning on survey items such as "I tend to bounce back quickly after hard times". These items form a scale in (for example) the 'brief resilience scale' which is found to correlate positively with active coping styles and optimism, and negatively with depression, anxiety, and perceived stress (Smith et al. 2008). This subjective approach is open to the same criticisms of the trait model; such attributes do not presuppose the presence of stressors, and therefore situational variation in resilience is ignored. It may also inadvertently imply that some individuals do not "have what it takes" (Luthar et al. 2000, p. 546). Additionally, when resilience is captured in a subjective way along with other subjective ratings of psychological states, there is likely to be a degree of confounding and priming.

It is with some of these criticisms in mind that many researchers have stated that longitudinal research is preferred for testing hypotheses around resiliency (Rutter 1985; Boerner and Jopp, 2010). An example of such an approach is the seminal Kauai Longitudinal study which followed all 698 babies born on the island in 1955 until they were around 40 years old. The risk factors included poverty and parental psychopathology, and the outcome measures included self-rated functioning adult relationships and work life as well as objective measures such as criminal convictions (Werner 1993). A similar prospective study followed Minnesota school children from age 10 to adulthood, a research design which demonstrated the causal relationship between strong child-parent relationships and various cognitive skills to positive outcomes in adulthood (Masten et al. 1995). An alternative approach is the diary-based 'daily process approach' to measure short-term changes in mood and stress levels. This method has been able to highlight the fundamental role of positive emotions in overcoming the stresses of daily life, as well as playing a role in more profound life events (Ong et al. 2010).

The advantage of longitudinal research design in any field is that it can allow the empirical separation of cause and effect. Positive emotions serve as exemplar for the problem that faces researchers. They are a 'basic building block' of resilience (ibid.) in that they operate as a

resource or protective factor which reduces the potential negative effects of stressors, but on the other hand, positive emotions can be taken as an indicator of resilient coping (Fredrickson et al. 2003). Prospective longitudinal studies with appropriate analytical methods can allow the outcome to be separated from the resources, where such overlaps exist. It is with these advantages in mind that a longitudinal analytical approach is taken in this thesis.

1.3 Thesis overview and research question

This research is concerned with the money-happiness relationship and the influence that social connectedness has on that relationship. Applying the resilience terminology, connectedness is considered a *protective factor* or *resilience resource* which are considered equivalent terms. The adversity under scrutiny is financial stress, a concept spanning low incomes, having an income insufficient to meet needs and aspirations, and 'shocks' in terms of changes to financial circumstances. The outcome of interest is subjective well-being (from hereon SWB) which is used as an indicator of positive 'internal function' (Masten and Wright, 2010, p. 216). Resilience is conceptualised as a better outcome than might be expected in the circumstances, and in this is essentially relative in nature, which is to say it is determined by comparing the outcomes of one group to another. I follow Zimmerman and Brenner (2010) in that resiliency is demonstrated through the reduction of the effect of the external shock, and the level of reduction indicates the level of resilience. Individuals who suffer equivalent stress relating to their financial circumstances who reduce their happiness by one point are considered more resilient than those who reduce their rating by two points, and so forth.

Connectedness is expected to have a moderating influence on the effect of financial stressors on happiness. That is, the effect of the stressor will be modified by the social environment in which the individual is situated. In comparison to traditional work in child psychology, the presence of financial stressors, particularly in the condition of non-poverty, may exhibit a lesser influence on psychological affect and functioning. Indeed, in the wider context of resilience research Mayer and Faber (2010) classify financial setbacks as a 'mild stressor'. However, it is likely that such circumstances may also be linked to loss of status and public embarrassment which are considered to be stressors of 'intermediate' magnitude (p.98). Connectedness is taken to be an external or environmental resource, and is conceptually distinct from the psychological assets of positive emotionality and sociability which are likely to have an independent effect on psychological well-being as well as being a confounding factor of connectedness (Argyle and Lu 1990a).

The conceptual scheme of the thesis has considerable overlap with Graham and Oswald's (2010) 'hedonic capital', a term coined to capture the psychological resources available to individuals and an explanatory framework for dynamics of happiness. Examples of the items theorised to contribute towards the stock of hedonic capital include health, self-esteem, meaningful work, income and social relationships. Higher stocks of hedonic capital equate to lower volatility of well-being, where low volatility implies a greater ability to cope with stressors.

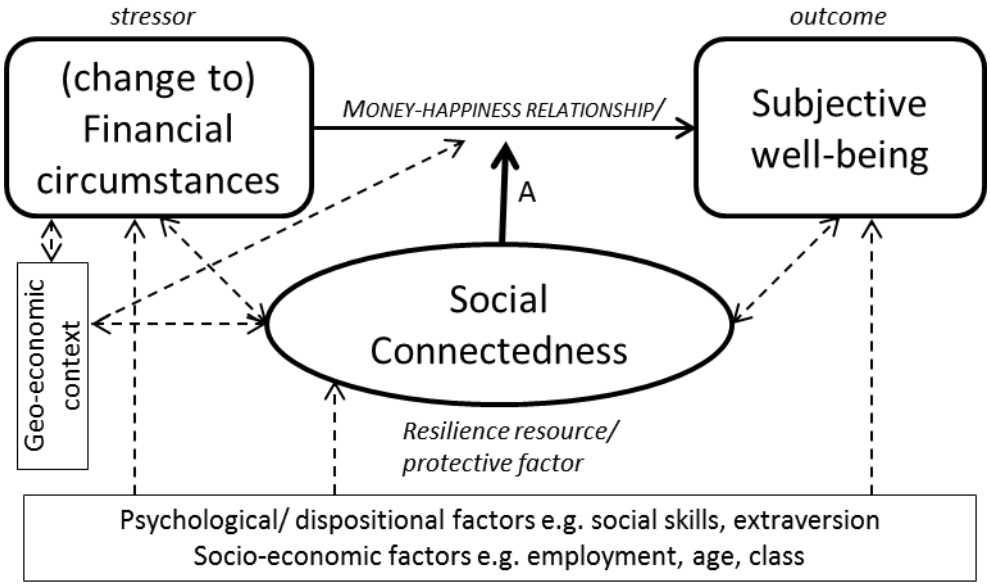


Figure 1.1 The thesis schema: arrow A represents the main research question. Potentially confounding factors and bi-directional relationships are indicated with dashed arrows.

A stylised schema of the research is shown in Figure 1.1. Arrow A represents the overarching research question. The thesis is structured thus: following this introduction the theoretical framework is laid out in Chapter Two. It is concerned with the money-happiness relationship, and how we might expect social connectedness to intervene in that relationship. In addition a series of potentially confounding factors are highlighted including socio-economic and psychological factors such as social skills and extraversion which are established coping resources in their own right as well as drivers of patterns of connectedness and subjective well-being.

The data used to address the research question are from the British Household Panel Survey, a representative sample of the UK population. It is described in Chapter Three along with the regression-based methods used to address the research question, and operationalisation of

the core concepts. Chapter Four is concerned with operationalising social connectedness and has as its aim the production of a suitable explanatory variable for the empirical chapters that follow. It presents literature on the measurement of connectedness highlighting types of social network that are likely to influence resilience to financial stress. The theoretical framework guides the empirical analysis and a latent class model is fitted that ensures that the measurement of connectedness is theory-driven and a suitable tool to address the hypotheses.

The empirical analysis of resilience is addressed in three chapters. The first, Chapter Five, establishes a baseline understanding of the effect of connectedness on the money-happiness relationship. To achieve this, a subsample of those with non-changing connectedness is selected. The second, Chapter Six, seeks to understand the effects of changes in connectedness as a way of exploring whether it is the connectedness itself, or the stable traits behind connectedness that explain resilience. Chapter Seven, the final empirical chapter, explores the effect of the geo-social context as a source of financial stress in terms of a reference group against which personal circumstances are compared. Chapter eight concludes. The outline of the thesis is summarised in Figure 1.2. The overarching hypotheses to be addressed are laid out at the end of Chapter Two.

Chapter 1 - Introduction
Rationale for the study; introduction to 'resilience' and a brief outline of the thesis
Chapter 2 - The money-happiness relationship and why social connectedness matters: theoretical framework
A discussion of relevant theory around the relationship between money and happiness, and why connectedness is hypothesised to intervene in the relationship
Chapter 3 - Data and Methods
A description of the data and methods and operationalisation of core concepts
Chapter 4 - Patterns of connectedness: Developing a measurement schema of strong and weak ties
What types of connectedness can be expected to function as a resilience resource? Can these be represented using a latent variable model? What is the nature and socio-economic profile of each type of connectedness? How stable is connectedness through time?
Chapter 5 - For whom money matters less: non-changing connectedness as a resilience resource
Does social connectedness influence the money-happiness relationship?
Chapter 6 - Something about the network or something about the person? The dynamic nature of connectedness and resilience
What are the causes and consequences of changes in connectedness? Is it the connectedness itself, or the psychological disposition of the individual, that functions as a resilience resource?
Chapter 7 - Who cares what the neighbours earn? An examination of the effects of social comparison on the well-connected and the isolated
How can we square conflicting hypotheses on the effect of social ties on social comparison? **Does connectedness influence the degree to which SWB is affected by relative income position?**
Chapter 8 – Conclusion
Summary, conclusions, limitations and implications for future research

Figure 1.2 A summary of the thesis by chapter content/ questions addressed. The main research questions are in bold**.**

Chapter 2. The money-happiness relationship and why social connectedness matters: theoretical framework

2.1 Money makes you happy, but how?

Traditional economics is underpinned by the assumption that income provides opportunities for spending and consuming in ways that contribute towards happiness. Money can buy desirable items including material goods, better safety, security and health, and pleasurable experiences (Lucas and Schimmack 2009). The positive relationship between money and happiness is well-evidenced and personal or household income is consistently shown to correlate with the happiness of individuals and GDP per capita correlates with the average happiness of countries (Clark et al. 2008). Health research also provides support for a direct causal effect of money in that psychological stress is brought about by living on an income insufficient to manage needs (Alder and Snibbe 2003).

Easterlin (1973) was among the first to challenge this direct and causal explanation by showing that increases in GDP per capita over time are not accompanied by increases in happiness in developed countries. This observation was later corroborated with evidence from panel data showing that the incomes of individuals showed no relationship to their happiness levels over a fifteen-year period (Di Tella et al. 2010). The apparent paradox between the cross-sectional and longitudinal evidence is usually explained by means of two theories from psychology.

The first of these is adaptation, which posits that the highs and lows brought about by life events are temporary and in time people adapt to new conditions. Brickman et al. (1978), for example, showed in their classic study of lottery winners and accident victims, that the happiness of lottery winners was no higher than that of the control group[1]. The new pleasures available to the lottery winners had become habituated as "the thrill of winning the lottery [wore] off" (p. 918). Everyday activities such as watching TV and eating were rated as less pleasurable by the lottery winners than the control group. On the other hand, the accident

[1] On a scale of zero to five, the lottery winners averaged 4.0 compared to 3.82 in the control group. There were therefore a little happier, though the difference was not statistically significant. Critics of this study point out sampling and response bias and small sample sizes, and thereby question the generalizability of the results. Nonetheless, Brickman et al.'s work was seminal in theorising and demonstrating habituation processes.

victims did not gain extra pleasure these activities, perhaps because of the 'nostalgia effect' in which the past is used as an anchor. This 'variable perspective' model conceptualises a personal scale of pleasure, to which a positive or negative life event can add a new extreme endpoint, thus shifting ratings of more everyday experiences up or down the scale, and therefore things are judged by the extent to which they "depart from a baseline of past experience" (ibid).

Adaptation to changes in income level has been illustrated with panel data where an increase in happiness immediately follows an increase in income, but over the subsequent year reverts to the baseline level almost completely (Di Tella et al. 2010). Burchardt (2005) provides further evidence in support of adaptation theory by showing that within the top income quintile group, those with a steady income are less happy than those who have had a recent increase. Similarly, those who have recently fallen into poverty are less happy than those who have been poor for a longer time. The adaptation effect may operate in part through a shift in aspirations and perceived needs. Stutzer (2004), for example, finds that those with higher incomes report higher values for the "absolute minimum in order to make ends meet" (p. 94).

Further support of adaptation theory is shown in a number of studies showing that only recent events influence current happiness levels. Suh et al. (1996) show that, among recent graduates (so therefore not a representative sample), only events (both positive and negative) occurring in the prior 3 months affect life satisfaction, although positive events from up to 6 months ago continue to influence positive affect. Studies in which a long time elapses between the event and measurement of happiness often find no effect. For example, there is no influence on happiness of changes to marital, employment, or residential status over 9 years (Costa et al. 1987). The level of happiness to which people return to is known as 'set-point' which is thought to be largely determined by dispositional factors. The set-point does not imply neutrality; most people are happy for a large proportion of the time (Diener et al. 2006).

Complete acceptance of adaptation level theory or set-point theory implies that there may be little point in researching the relationship between life events and SWB, that attention to non-dispositional factors is futile (Veenhoven 1991). However, there appear to be many cases where adaptation is incomplete. For example, people who have undergone cosmetic surgery do not revert to set-point but appear to experience permanently elevated happiness; likewise it seems difficult to adapt to a continual presence of loud noise (Easterlin 2003). Furthermore, it seems that people return to set-point fairly swiftly after marriage, but widowhood continues to make people unhappy after 5 years (Diener et al. 2006). Unemployment has been noted to

have a lasting negative effect on life satisfaction even when the individual becomes employed again, suggesting that the set-point itself has been lowered (Lucas et al. 2004). Additional evidence countering set-point theory is provided by cross-national research which highlights the importance of wealth, but also human rights: people do not adapt to poverty or to infringements of personal freedoms (Diener et al. 2006).

In light of the evidence that adaptation is not always complete, academic enquiry has developed away from establishing the existence of, or the level of, set-points, and attention is given to why and how individual differences in completeness of adaptation and speed of return to set-point can be explained (Diener et al. 1999, Easterlin 2003). Accounting for the many situations to which set-point theory does not apply, 'set range' may be a more useful concept (Diener and Biswas-Diener 2008).

The second explanation for the Easterlin paradox is social comparison, whereby individuals determine how they feel about their lives by looking at the earnings and lifestyles of others. The social comparison effect has been demonstrated quantitatively by modelling the effect of the average income of the reference group alongside personal income. The coefficients tend to be 'equal and opposite' (Clark et al. 2008) which is to say that the positive impact of personal income can be pulled down or cancelled out by the income of others. The highest happiness is therefore achieved where personal income is high and the income of others is low. The social comparison effect has been demonstrated where the point of reference is 'people like me' of the same age group, level of education, doing the same job and so on (Clark and Oswald 1996), but also where the basis is a geographical unit such as at the state (Blanchflower and Oswald 2004) or neighbourhood (Luttmer 2005). The difficulty with studies such as these is that the reference group is assumed, and data on social interaction with the reference group is harder to come by, as indeed it understanding who an individual may choose to compare to.

The debate on the mechanisms behind the money-happiness correlation is summarised in terms of *relative* versus *absolute* income. Absolute income reflects the direct and causal effect of money and infers that money brings about SWB through the fulfilment of needs which are unchanging over time. On the other hand, proponents of relative income as the explanatory mechanism posit that the 'standard' is changeable across time and culture. The relative income theory is supported by Easterlin's (1973) evidence that SWB is stable though time despite rising incomes and by the stronger predictive power of ranked incomes over the raw indicator (Boyce et al. 2010). Conversely, Layard et al. (2008) demonstrate declining marginal utility, that is, progressively smaller returns to happiness are seen as we move further up the

income scale, a pattern that backs the absolute income account as it suggests that money is directly helping individuals to meet needs at the lower end of the scale where needs are more visceral (Veenhoven 1991). Diener et al. (1993) show that the magnitude of the income effect is equal in rich and poor areas and thus support the absolute income thesis. However, the outcome under scrutiny was an affective measure of SWB rather than an evaluative measure such as life satisfaction. The following section elucidates on the importance of the outcome, and different patterns observed by the type of SWB.

2.1.1 The outcome matters: different concepts of Subjective Well-Being

The mechanism at work is revealed to some extent in empirical work that examines the shape of the money-happiness relationship. Where returns to income diminish to the point of being substantively negligible, the pattern can be alternatively interpreted as a 'threshold effect', the threshold being a cut-off point above which money makes no further contribution to happiness. Based on data from the USA, Kahneman and Deaton (2010) suggest that the levelling off in the income curve illustrates such a threshold. Their analysis is informative in another, critical, respect. It shows that the shape of the money-happiness relationship curves differ according to the outcome; SWB, after all, can be conceptualised in many different ways. Where the outcome is "reporting yesterday as a stress-free day", the slope levels off at a household income of around $40,000, above which additional income brings no additional stress relief. The income curves for positive affect and "feeling blue" level off at around $75,000. It is assumed that the steeper slope at the lower end of the income scale reflects the fulfilment of basic needs, such as the ability to avoid pain and disease and to be able to spend time with loved ones. However, where the outcome is life satisfaction the relationship with happiness is more linear and gains remain evident at high income levels. Others confirm that the income-life satisfaction relationship is linear, particularly where income is measured in ordered categories, for example Lucas and Schimmack (2009) show higher satisfaction for those in the top income bracket than those in the second highest, and so on down the entire scale.

At low incomes, then, the mechanism does appear to be direct and causal and income makes a large contribution to reducing stress and increasing positive affect by allowing needs to be fulfilled. Life satisfaction stands out as being different to the affective and mental health outcomes. Given that life satisfaction correlates moderately with positive affect and mental health (Argyle 2001), its difference is something of a puzzle and suggests that particular mechanisms explain life satisfaction that do not apply elsewhere.

Life satisfaction is an evaluative measure, which requires survey respondents to stop and think about their lives and make a judgement of 'life as it is' compared to their personal standards of 'life as it should be' (Veenhoven 1991). The judgement therefore depends upon goals and aspirations as well as current circumstances. By manipulating experimental conditions Gleibs et al. (2011) show that money has no influence at all on SWB in the absence of activating economic concepts, which suggests that money influences our evaluations of life only when our attention is brought to it. Such experimental data are important, but are not generalizable to the population. Using survey data, it has been shown that people have a tendency to exaggerate the importance of the impact of single factors on their well-being, a phenomenon labelled a 'focusing illusion' by Kahneman et al. (2006). Indeed, the life satisfaction question may itself elicit a response based on a focusing illusion as it is asked in surveys alongside questions of socio-economic factors such as income and home-ownership and so "[draws] people's attention to their relative standing in the distribution of material well-being and other circumstances" (p. 1908). It is also pointed out that people are not ready with prepared cogitated answers to such difficult questions about life: "[t]he answers to global life satisfaction questions are constructed only when asked, and are, therefore, susceptible to the focusing of attention on different aspects of life" and thus, life satisfaction questions "probably evoke a reflection on relative status…" (p. 1908-9).

2.1.2 The role of status and psychological benefits

The role of status in health studies was brought to the fore by the Whitehall studies which were seminal in demonstrating the "social gradient" in health. The research showed that in addition to health behaviours that are determined to some degree by social class, psychosocial factors were at work. These include autonomy, or having control over one's life, and self-esteem (Marmot 2004). Marmot describes the need to consider status:

> "We need a richer understanding that poverty and wealth are not only about money. At a higher level of income, if you are really swimming in it, money may still appear to be important for health because it is a way of keeping score – a marker of success. But it is not the money that is important, it is the score" (p.63) and "if you were paid more, it was not so much that you could do more with the money, but that you were more highly valued" (p. 77)

The importance of status is inherent within social comparison theory, though rarely made explicit in the literature on income and happiness (cf. Layard 1981; Boyce et al. 2010). Cummins (2000) also describes the psychological factors by which the money-happiness

relationship takes effect, as being dependent upon the 'internal buffers' of perceived control, self-esteem, and optimism: "having a low income is likely to reduce the probability of exerting environmental control, of feeling good about oneself, and in projecting oneself into a brighter future" (p. 139). The importance of these psychological states is widely supported by empirical studies. For example, Johnson and Krueger (2006) show that the money-happiness relationship is entirely mediated by perceived control over various aspects of life. Their study is based on a sample of monozygotic and dizygotic twins thus allowing fixed effects to be included in the models; the mediating role of perceived control is robust to environmental and genetic influences on life satisfaction. Other studies concur; Lachman and Weaver (1998) find that those in low income groups but with high perceived control had comparable health and life satisfaction to those in higher income groups.

Money is linked to self-esteem in studies of feelings and attitudes towards money. Pay within organisations is known to influence perceptions of self-worth: "It is also probably true that we use money to prize personal worth: that we tend to value ourselves in proportion to the money that others are willing to pay for our efforts" (Furnham and Argyle, 1998, p.102). In other words, money confers worthiness. Research into consumption patterns reveals the same link; the acquisition of material goods is used as a means of establishing a sense of self-worth by those with materialistic tendencies (Ruvio et al. 2013; see section 2.1.3). The self-esteem mechanism is also made explicit in studies of spending behaviour (and values, see section 2.4.4). Low self-esteem correlates with both compulsive spending and reporting that income is not enough to manage needs (ibid.). Others have found that one of the reasons that people run into debt is because spending money is a way of boosting self-esteem (Matthews 1991). More generally, expressions of a lack of self-worth are frequent among those perceiving themselves to be low in social status (Charlesworth et al. 2007).

2.1.3 Theories of consumption

In traditional economics, work is viewed as 'pain' but is the also the means to achieve happiness via the consumption of goods. The happiest person would be "someone with a full shopping basket and lots of free time" (Heady et al. 2008). Observed behaviours are interpreted as 'revealed preferences' based on the trade-off between work and leisure. While acknowledging that this view is simplistic, Heady et al. (2008) argue that to fully understand the degree to which money can influence happiness, consumption should be taken into account. Their study takes a measure of spending on groceries, meals out, and leisure (which are taken to be a good proxy for non-durable expenditure); however, the analysis shows that consumption by this measure does not account for any additional variance in life satisfaction

for the British sample after controlling for income and wealth. It is likely that the measure of expenditure used in this study misses essential elements of how consumption influences SWB.

The sociological approach to consumption, on the other hand, emphasises that it is a cultural phenomenon, and that consumer goods have an important influence over the way that social life is experienced by individuals. Goods also have a symbolic value and as such income is not merely a means to fill a shopping basket with essentials, but is a way of expressing identity (Miles 1998). The social consequences on consumer choices have been noted in the early sociology of Vleben (1899) who saw consumer goods as markers of prestige, and Simmel (1957) who pointed out that fashion performs a role of social demarcation (summarised in Miles 1998).

The link between consumption and social status is perhaps most associated with the work of Bourdieu (1984), who saw consumption as a cultural resource, a set of symbols, ideas and values, that are a means of marking one social group from another. Bourdieu noted that "There is no worse deprivation, no worse privation perhaps, than that of losers in the symbolic struggle for recognition, for access to a socially recognized social being, in a word, to humanity" (from Pascalian Meditations, cited in Bauman 2007, p. 1). The relationship between social status and cultural consumption is well established (e.g. Chan and Goldthorpe 2010). Miles (1998) uses the term consumerism, as distinct from consumption, as one that emphasises the relationship between people and consumer goods thus addressing the psycho-social bridge between individuals and society. Empirical evidence supports the idea that a lack of the right symbolic goods is associated with psychological distress, with feeling of not fully partaking in society and of being under-valued (Charlesworth et al. 2004; Marmot 2004). That life satisfaction continues to improve beyond the fulfilment of basic needs suggests that symbolic consumption, or consumerism, may play a role.

Other approaches highlight important ways in which subjective well-being can be influenced by consumption. One such approach is that of 'maladaptive consumption' or 'compulsive consumption' (e.g. Ruvio et al. 2013; Hirschman 1992) where individuals seek stress relief from shopping and consumption. While there appears to be no correlation between income and patterns of maladaptive consumption (Ruvio et al. 2013), the consequences of this type of consumption may include debt, relationship problems and reduced self-esteem (Hirschman 1992) which will have costs to SWB.

2.2 The role of social connectedness

It is not only the valuation of life situation and financial circumstances, but also self-evaluation more broadly that occurs through social comparison and reflection (Festinger 1954; Thoits 2013). It follows that social connectedness has the power to influence self-worth and self-esteem which in turn are associated with happiness (Lewinsohn et al. 1991). Social interactions, as experienced by the individual, shape the cognitive processes that bring about SWB. Connectedness has the ability to enhance self-esteem (Brown and Harris 1978), provide purpose and meaning (Thoits 2013), self-worth (Weiss 1974) and a sense of control (Johnson and Krueger 2006) and thereby has the potential to intervene in the money-happiness relationship.

2.2.1 Social connectedness and well-being

Social relationships have a central role in maintaining SWB (Diener et al. 1999; Argyle 2001; Layard 2005; Kahneman et al. 2006). The strength of the relationship is strong, particularly where the outcome is positive affect: "it is only a slight exaggeration to say that our happiness is the experience of spending time with people you love and who love you" (Kahneman 2011, p.395). Close supportive relationships are a 'necessary condition' for happiness (Diener and Biswas-Diner 2008), but beyond that, the extent of the need for social connection is subject to individual variation. Some people may be happy with ties to an intimate few while others need space or perhaps a large crowd for self-expression and belonging, and well-being suffers when the needs of the individual are not met (Cacioppo and Patrick 2008). Some of the need may depend on objective circumstances, for example, Niemenen et al. (2010) show an interaction between living arrangements and social connections: those living alone and not participating in social activities are in the worst position.

As well as SWB, social relationships have been shown to be an important predictor of objective health outcomes. The 1970s saw the results of several prospective longitudinal studies which were seminal in both demonstrating that mortality is inversely related to social integration, and in their capacity to pinpoint the direction of causality. For example, in the Alameda county study, pre-existing health status as well as health behaviours (such as smoking and exercise) were controlled for and the finding held: those who have more social connections live for longer than those with less (Berkman and Syme 1979). This study used an index of social integration made up of being married, having friends and family, frequent socialising, church membership and other forms of group memberships, although it also showed an independent effect of each of the factors. Social integration constructed by this method appears not an either-or category but a scale on which there is a corresponding gradient of mortality rates. On

the other hand, it has been suggested that it is social isolation which is particularly damaging, and additional social relationships above a 'moderate threshold' are of less significance (Blazer 1982).

2.2.2 Social Support

The idea that relationships provide a sense of protection in difficult times forms the base of 'social support', a theory backed up by a large body of research which emerged throughout the 1970s and 80s. Bowlby's 1969 attachment theory provides the foundation of the psychological framework of social support. He argued that the close connection between carer and child creates the 'psychological protection' that promotes healthy biological functions including blood pressure and metabolism. In adulthood, it was originally proposed that the spouse becomes the primary attachment, providing a "protective shell in times of need" (Holmes, 1993). In studies of social networks, it has been shown that it is close ties, including friends and extended family as well as intimate partners that provide emotional and other types of support (Stack 1975; Wellman and Wortley 1990)

Various studies emphasise the importance of social relationships in buffering the potentially adverse effects of stressful life events on well-being (House et al. 1988). Research has shown benefits to specific groups, such as support group meetings that improve the survival rate after breast cancer, and the protective power of having a husband or boyfriend to women who have experienced negative life events (summarised in Halpern 2005). Lin and Ensel (1989) concur that perceived support, described as two factors of 'expressive' and 'instrumental' support, reduces the chance of depression after a stressful event; likewise, people with low social support have lower odds of recovery from common mental illness (Pevalin et al. 2003). Frederickson et al. (2003) show that positive emotions help to restore normality during stressful events and it may be that friends provide this vital source of mood uplift (Diener and Biswas-Diener 2008).

Many studies of social support have focused on the 'buffering hypothesis' in which the presence of social support mediates the effect of life events on health and well-being (Thoits 1982). Empirical work supports the hypothesis by showing that interaction terms between the stressor and the support show stronger effects on the outcome than the main effects (Lin and Ensel 1989). However, measures of perceived social support correlate with life satisfaction and mental health even when there are no stressful events suggesting that there is a main effect as well as a buffering effect (Powdthavee 2009; Halpern 2005).

Assuming that everyone experiences stress and needs support from time to time, the social support process itself can be considered a causal mechanism linking social connectedness to SWB. While social support is assumed in some studies to coincide with social relationships, evidence suggests that in fact they are two discrete concepts, each having an independent effect on well-being. Perceived support is found to mediate only part of the effect of relationships and socialising on mortality, and research of the elderly has found that frequency of socialising has a beneficial effect over and above perceived social support (Blazer 1982). Some friendships are more relevant as sources of companionship than support which is a separate but essential need for SWB (Bellotti 2008).

2.2.3 The benefits of secondary ties

There is plentiful evidence showing that informal strong ties are the ones that provide emotional support, love and sympathy, as well as providing practical and financial help (Wellman and Wortley 1990; Thoits 2011; Stack 1975). Few studies explicitly explore the benefits of weaker ties (cf. Granovetter 1973; Erickson 2004); however, Thoits, in her 2011 review, draws on decades of social support theory to suggest distinct provisions of primary and secondary ties. Primary ties are defined as being small in number, informal, intimate and enduring, while secondary ties tend to be greater in number, with more formal interactions guided by rules and hierarchical positions. Examples include ties formed through membership of voluntary and religious organisations which are frequently applied as measurements of social capital and social integration (e.g. Putnam 2000; Berkman et al. 2000).

Thoits posits that an extensive secondary network increases the probability of finding a person with similar past experiences who can provide aspects of support such as information and advice, coping encouragement and threat appraisal, that may be unavailable from strong ties. In the presence of direct experiential knowledge, the secondary social tie can offer empathy, but also certainty about the appropriateness of emotional reaction and coping behaviours. In addition, secondary ties are more likely to be role models that can be observed and emulated, which is to say that they are more relevant as a reference group for self-evaluation than primary ties and therefore more likely to yield self-esteem, self-worth and perceived control. Some empirical evidence bears this out. Participants in a social comparison study, for example, more often chose colleagues as points of reference than close ties (Clark and Senik 2010). In describing the role of employment, taken as relevant here as a source of secondary ties, Jahoda (1982) states that in contrast to family and other close ties "…the emotionally calmer climate of relations with colleagues provides more information, more opportunity for judgement and rational appraisal of other human beings with their various foibles, opinions

and ways of life" (p. 26). Weak ties also extend the range of social roles which are associated with the positive outcome and coping tool 'sense of control' where it is supposed that the effortful accomplishments associated with role obligations provide the efficacy and belief that problems can be overcome (Ross and Mirowsky 2013).

Furthermore, connections to organisations have also been linked to improved well-being. Berkman and Syme (1979), for example, show that church attendance and other voluntary group membership reduces mortality, an effect independent of marital status, friends and family and frequency of socialising. The social capital literature provides additional evidence for the benefits of organisation-based connections. In the USA, data suggest a positive effect of 'civic connections' on happiness (Putnam 2000). Benefits to SWB may also be indirect; for example, Stolle and Rochon (1998) show that mixing with diverse others in organisations builds trust and reciprocity and in turn social trust is shown to be linked to SWB (Helliwell and Wang 2010). There is qualitative evidence supporting the idea that psychological benefits derive organisation-based activity; Cattell (2001) describes how study participants who volunteered described how "becoming involved had changed their life" and one participant on taking up volunteering expressed that "giving is helping me find my sense of self-worth" (p. 1509).

The effect of organisations on SWB, however, is not consistent across studies. In the USA, Putnam (2000) finds the effect of organisations on life satisfaction to be a powerful one: "civic connections rival marriage and affluence as predictors of life happiness" (p. 333). On the other hand, Li (2007) finds that neighbourhood attachment and social networks are associated with happiness but that civic participation has no effect once health is controlled for. There could be several factors explaining why this study found no benefit of organisation-based social connections; firstly, neighbourhood attachment may be confounded with involvement in local organisations. A second consideration is that if social ties are the central component of the hypothesised effect of organisations, then it is necessary to measure activity with organisations, rather than membership.

A further point may explain the specific contribution of secondary ties to SWB. Being involved with a group or organisation is a way of focusing attention away from oneself and attention 'inwards' has been linked to unhappiness. This was shown in an experiment in which those focusing on 'who you strive to be' were less happy than the control group who were primed to think about non-personal matters (Lyubomirsky and Nolen-Hoeksema 1993). Similarly, groups provide a sense of identity that "… help us to become part of something larger than ourselves"

(Diener and Biswas-Diener 2008, p. 55). The modern theory and empirical demonstrations have Durkheimian roots; on 'common purpose' within social groups, Durkheim suggested that "…the high goal towards which their gaze is tuned alleviates the suffering that they feel from life's troubles" (2006 [1897], p. 225).

Role identity is an additional aspect of social connectedness that may influence SWB; Moen et al (1989) conceptualise the benefit of multiple roles to be "providing access to wider access to various components of society" (p. 636). It is theorised that purpose and meaning are gained from the normative behavioural expectations evident in different social settings accessed through different roles (Moen et al. 1989; Thoits 2013). The importance of roles builds on early sociological theory including Merton (1957) on role-set, Goffman (1959) on the 'multiplicity of selves' and Simmel (1922) on multiple activity systems (summarised in Coser 1975). For example, Simmel's contribution is summarised as follows:

> "[He] sees a person's participation in multiple activity systems as a source of individual freedom. In Simmel's view, the fact that an individual can live up to expectations of several others in different places and at different times makes it possible to preserve an inner core, to withhold inner attitudes while conforming to various expectations." (ibid. p. 241)

The mechanism for the benefit of connection to organisations can be understood in the context of Weiss's provision of 'reassurance of worth' (1974), this particular social role providing feelings of competence and a chance to use and get recognition for skills.

2.2.4 Social Integration

Durkheim's *Suicide* (1952 [1897]) is not only a study of suicide, but of happiness, coping and desires and how the relationship between the individual and society has a bearing on these matters. I use the concept of *social integration* in this study, although with some departure from Durkheim, for whom integration was a state of societies, while my usage (as others have applied it before) is a description of the individual's relationship to wider society in the form of social ties. Many studies in the Durkheimian tradition have focused on *anomie* (e.g. Berkman et al. 2000), but *egoism* is also relevant in this study. Anomie results when society lacks influence in individual passions while egoism results from a lack of collective activity.

2.3 Further theoretical considerations

2.3.1 Social Capital

The most theoretically refined definition of social capital is often attributed to Bourdieu (e.g. Portes 1998, Warde and Tampubolon 2002). Bourdieusian theory uses the concept of social capital, alongside cultural capital, and interacting with economic capital, as the explanatory mechanism of the transmission of class advantage from one generation to the next (Bourdieu 1986). The practices, knowledge and demeanours present in high status subcultures are condensed into the term cultural capital, a resource which enables the enhancement of earning potential and educational status. Social capital can be called upon when cultural capital fails, and embodies the potential of the well-connected to draw on their network resources to obtain high status jobs. Demonstrations (notably Granovetter 1973) that personal networks can and indeed are used to find (better) employment add empirical weight to the theory.

Lin (2001) added a major contribution both to the theoretical foundations and to the empirical assessment of social capital. He developed the 'position generator' method whereby survey respondents are asked if they know anyone (and how well etc.) with particular jobs from a given list. The job titles are deliberately sampled from a range of hierarchical positions, and it is thus possible to gauge the amount of network resources in terms of status. The status of an individual's social ties has been shown to be predictive of the individual's job status, thus demonstrating that not all ties are equal.

Coleman (1988) developed a theory of the social capital based on the rational actions of parents in securing human capital for their children. There are two mechanisms; firstly, the investment of time and effort by parents in the academic achievements of their children, such as helping with homework, a description which resonates with Bourdieu's cultural capital. Secondly, 'intergenerational closure' (p. 107), the existence of a social connection between the parents of children who are friends, is a structural constraint allowing for an exchange of knowledge serving the function of social control. The conceptualisation of social control as an outcome of social capital was perhaps the cue for a shift in attention from the benefit of the individual to the benefit of the community.

Indeed, the notion that social capital is good for everyone in society not just individual is perhaps what has caught the attention of so many academics and policy-makers over the past decade. The 'public good' aspect was brought to the fore largely by the work of Putnam (Putnam et al. 1993; Putnam 1995; 2000). The earlier work focused on membership and

activity in voluntary organisations through which, it is theorised, trust is accumulated which in turn promotes the healthy running of the economy and democracy. In later work (Putnam 2000), the list of indicators was extended to include informal social connections and activities, and since then it has continued to grow and includes neighbourhood attachment, socialising in various forms, giving informal help, to name but a few (e.g. Halpern 2005, Li 2007, Letki 2008). Together these foundation works on social capital have generated a set of tensions. For example, it is unclear if it should be conceptualised at the level of the individual or the community, or whether a loose-knit network (i.e. to get jobs) would be richer in social capital than a close-knit one (for social control).

Coleman contended that social capital is defined by its function, and can exist in a variety of forms (Coleman 1988), a position not without criticism (e.g. Portes 1998). While not synonymous, function cannot be considered without questioning whether it implies purpose and the extent to which certain social behaviours constitute a deliberate attempt to gain access to resources. Bourdieu emphasised the intentional use of social ties to gain access to positions of social status; Coleman too sees the amassing of social capital as a deliberate goal. Others conceptualise social capital an unintended by-product of affective ties (Crow 2004), a position enforced by Putnam's later attention to informal socialising. The economics framework also places weight on the deliberate nature of the accumulation and use of social capital as "…*investment* in social relations with *expected* returns in the marketplace" (Lin 2001, p. 19, emphasis added). Among the 'expected returns' of social capital are better jobs, better education for your children, as well as 'social returns', expressive in nature, such as mental health and life satisfaction. By extension, these expressive returns must include all of the benefits of social connectedness including social support and the other 'provisions', including self-esteem and self-worth.

In contrast to the resource-based approach is the 'normative' social capital in which social actions such as organisation memberships are laden with the value judgement of being socially desirable (Curtis 2010). For example, the 'social capital decline' thesis (Putnam 2000) has been criticised for its unacknowledged class bias (Portes 1998) and critique of modern society (Curtis 2010).

The social capital literature is important in several key respects in this thesis. Firstly, as it convincingly shows a link between social and economic resources, it highlights the need to consider resource-based explanations for the effect of social ties on the money-happiness relationship. Social ties, for example, might be a resilience resource because they provide low-

cost childcare and make a real difference to those who may otherwise be struggling on a low income. Secondly, this literature is the most comprehensive source of evidence on the effects and correlates of activity with voluntary organisations (as described in sections 2.3 and 2.3.1.2).

2.3.1.1 Terminology: 'connectedness' versus 'social capital'

Despite the debates surrounding the (lack of) theoretical and conceptual clarity of the term 'social capital' (Portes 1998), the social capital literature provides a valuable empirical source of understanding how social connectedness interacts with economic factors. Despite overlap, the term 'connectedness' is preferred to 'social capital' throughout this thesis. This reflects the theorised mechanism, which is not the fungibility with economic capital that often constitutes a core part of the definition of social capital. Instead, the theorised psychological benefits may well be an unintended consequence of connectedness and one that comes more easily to individuals of a sociable disposition. Further, the preference for the term 'connectedness' reflects that, despite consideration of the wider community, the benefits of social ties are demonstrated in this research at the individual level only, and no attempt is made to claim the 'public good' of such connections. Finally, in Chapter Seven, connectedness to a wider circle is also considered as a negative influence to SWB, thus falling outside the more usual consideration of social capital as the positive consequences of social ties (Portes 1998).

2.3.1.2 The two dimensions of social capital

Many, but not all, of those who have theorised and researched social capital have made distinctions between types of social capital and the relative functions and outcomes associated with each. Putnam (2000) makes use of the Yiddish terms *macher* and *schmoozer* to illustrate two types of socialite. Machers spend a lot of time in formal organizations such as the church and community projects, they also follow politics and give to charity as well as giving blood and volunteering. In short machers are 'people who make things happen' and 'the all-around good citizens of their communities' (pp. 93-94). Schmoozers on the other hand, though equally social, conduct their activities in a less organisation-based manner, and have dinner parties and play cards, go to bars and so on. The socio-economic divides which accompany the distinction are also pointed out; the more organised socialising of machers is more prevalent among the higher income groups and the middle-age groups, a pattern that holds in the UK (Li 2010).

Following Putnam's emphasis, there has been a body of work focusing on "associational social capital" in which voluntary associations or memberships and activity in organisations are the indicator of choice, also sometimes defined as *civic participation* (e.g. Stolle and Rochon 1998).

This is often to the extent that belonging to an association or organisation appears to be the defining feature of social capital, as a result perhaps of the ease with which it can be measured (ibid.) due to the availability of data on memberships as well as self-reported behaviour on surveys. The contrasting side to looking at organisational membership is that of informal social connections, sometimes labelled ‘social networks’; measurements include number of friends, informal helping, frequency of socialising (e.g. Li 2007; Letki 2008; Nieminen et al. 2010). In the social capital literature, 'social support' is not usually measured directly, but is inferred from the presence of ties, or from socialising behaviour.

Social capital can also be differentiated in terms of bridging versus bonding. Bonding is described as the intimate relationships with friends, partners, and close family members, as well as the feeling that this intimate group offers sufficient social support. Bonding social capital has been linked to in-group loyalty and homogeneity (Putnam, 2000). On the other hand, bridging represents the connection to wider social circles, is more outward-looking in nature (ibid) and means that the network encompasses those from diverse social groups. Membership in organisations is often taken as an indicator of bridging, albeit an imperfect one (Stolle and Rochon 1998). Erickson (2004) finds voluntary associations to be a ‘powerful’ source of social capital in terms of having diverse contacts.

Granovetter (1973) uses the language of weak and strong ties to explain bridging and bonding. ‘Strong ties’ are ties with stronger sentiments of friendship, accompanied by more regular and intense interactions. ‘Weak ties’, on the other hand, connect to the wider, extended network. To Granovetter, bridges are always weak, although weak ties are not automatically bridges. This conceptual distinction does not fully coincide with the notion of organisation membership as bridging particularly for social organisations where ties with fellow members may well be strong. Putnam acknowledges that certain types of organisation lend themselves to bridging, while others embody the idea of bonding in their homogeneity, such as ethnic fraternal organisations or church-based women’s reading groups (p. 22). Others have concurred that the kind of organisation matters: generalised trust, for example, is linked to the diversity within the organisation (Stolle and Rochon 1998).

Overall, while there are conceptual distinctions to be made between these pairs of labels used to categorise social capital, they can be categorised as shown in Table 2.1, with strong ties, bonding, and schmoozing all being associated with those social connections constructed informally, that are longer-lasting, incorporating friends and family and being accompanied by a feeling of identity, reliance and support. On the other hand, social capital based on

associational or organisational connections, made up of machers, likely predominated by weak ties, is better described as more formal, structured or organised in nature. These two tracks of social capital form the basis of the measurement schema in Chapter Four. Perhaps bridging does not belong in this categorisation, for although it is often operationalised in terms of organisation membership, it is usually defined by its function of transcending sociological boundaries (Putnam 2000; Laurence 2011), which may or may not occur in a weak or strong relationship and in a formal or informal setting.

More informal/ strong	More formal/ weak	Used by
Friendship networks	Voluntary associations/ organisational memberships	Putnam (2000)
Strong ties	Weak ties	Granovetter (1973)
Schmoozers	Machers	Putnam 2000
Bonding	Bridging	Putnam 2000
Primary	Secondary	Thoits 2011

Table 2.1 Types of social capital

2.3.2 Hierarchy of needs: the Maslovian perspective

Maslow's (1970 [1954]) 'hierarchy of needs' provides a source of overlap with some, but not all, aspects of the theoretical framework of this thesis. Self-esteem is considered by Maslow to be a basic need albeit one that is ranked above physiological, safety, belongingness and love needs. His theory emphasises that these needs are strong motivators of human behaviour. Fulfilment of these needs can bring about a shift in values and a reconstruction of the conceptualisation of the good life; it fits, therefore, that satisfaction with life may shift as self-esteem needs become fulfilled. Money would have a strong role here, as the physiological needs and safety needs may be largely fulfilled through direct and causal spending power. Further, belongingness and self-esteem needs may be met through symbolic consumption; the partaking in cultural events, purchase of fashion items, or meals out, all representing ways of engaging in the social world around (Miles 1998). Maslow, however, points out that these needs, as well as self-esteem, may be fulfilled through relationships with others. Satisfaction of the self-esteem need brings about self-confidence, a sense of worth, and a feeling of being useful and necessary in the world. 'Self-actualisation' is the ultimate value (and need), and is a state defined by the fulfilment of potential. Among the many attributes, Maslow describes how self-actualising individuals are able to distinguish ends from means, be accepting of self and others, and form more fulfilling relationships. It has in common with later theory, such as

Inglehart's post-materialism (1981), the notion that the 'freedom' to care about higher order matters than money comes only when sustenance and safety (Inglehart) and love (Maslow) are provided.

On the other hand, the theoretical framework and empirical work in this thesis are a point of departure from Maslow in two ways. Firstly, the state of self-actualisation that Maslow envisaged, possible once all other needs are met, was rare and bestowed upon just a few. In accordance with Jahoda's stance that according full human stature to an elite few is "psychologically mistaken" (1982, p.20), the psychological benefits that are hypothesised to intervene in the money-happiness relationship are assumed to be commonplace, to change as freely over time as social networks do, and therefore do not reflect special features of particular individuals. The term self-actualisation is not considered to be of primary relevance and is not used, although conceptualisation of the good life beyond the material is consistent with Maslow's list of features associated with self-actualisers. Secondly, the belongingness and love needs and self-esteem needs are placed at different levels in Maslow's hierarchy, but are conceptualised here to be entwined in experience.

2.3.3 The satisfied poor

In theorising connectedness as a resilience resource, it is expected that those with low income but high connectedness will be more satisfied than those with low incomes and low connectedness. It is important therefore to consider the "satisfaction paradox" which is defined as the state of having poor objective life conditions whilst perceiving and evaluating life as good (Zapf et al. 1987). Adaptation is the most-cited and agreed-upon source of the satisfaction paradox (Olson and Schober 1993), whereby individuals adapt or 'resign themselves' to their situation and lose their motivation to make the necessary life changes to escape their state of poverty. The 'problem of adaptation' might be seen as the basis for dropping subjective measures in favour of objective ones (Teschl et al. 2005).

The opposite situation is also described in this literature, where those with high standards of objective living are 'paradoxically' dissatisfied. The empirical work in this thesis does not attempt an explanation for a paradox. Indeed, as many factors besides money bring about happiness, the term 'paradox' might be something of an overstatement. Instead, the money-happiness relationship is considered here more broadly than a state of having satisfactory living conditions or not. In relevant sections, controls and checks are put in place to ensure that the findings relate to the whole scale and are not simply an extrapolation of a poverty/ non-poverty dichotomy.

Others, in explaining the paradox, have noted that the objective-subjective discrepancy may result from measurement error in either the objective quality of life indicators or in the level of satisfaction (Olson and Schober 1993). The evolution of higher needs as basic needs are fulfilled, may explain the 'frustrated privileged' (Diener et al. 1985). Consumption plays a role here too; physiological needs may be fulfilled but if one is not able to join in with the social and cultural activities that allow for social recognition and belonging, then dissatisfaction may result. Connectedness potentially plays a role in both explanations, being both an objective need that is not taken into account, and as a source of fulfilment of higher needs.

2.4 More on the causes and correlates of happiness

This section outlines the main correlates of SWB according to the literature. The overview includes factors such as set-point theory that influence decisions on which analytical methods are most appropriate. In addition possible confounders are described, such as personality traits that are associated with SWB and connectedness, and indeed to the probability of experiencing a negative financial event. One of the main aims of this research is to isolate the effect of connectedness and therefore the confounding factors will appear in the empirical sections as controls or provide the basis for the choice of analytical method.

2.4.1 Health

Those who report being healthier, or being more satisfied with their health are also happier and have higher life satisfaction, a pattern which holds throughout the life cycle (Easterlin 2003). Multivariate models predicting psychological well-being often show that self-reported health is the most powerful predictor (e.g. Li 2007). This remains the case even when controlling for income indicating that the negative influence of health on SWB in non-pecuniary, which is to say that the relationship is not explained by the fact that those with poor health are also less likely to earn less than the healthy (Easterlin 2003).

While health is often taken to be a causal predictor of SWB, it is equally feasible that SWB causes good health. In a 2003 study in which subjects were exposed to a cold virus and monitored for a week, it was found that the people who were happier before the study not only reported fewer symptoms but also showed fewer objective, medical signs of illness suggesting that happiness may promote a healthy immune system (Cohen et al. 2003). Not only is the direction of causality between health and SWB likely to run in both directions, but health is also seen as an objective of living a happy life, that is as an end in itself, as well as a means to an end. In the UK people usually rate health as the most important factor for happiness after relationships (Argyle 2001).

There are physiological and social pathways linking happiness to health. Firstly, there are dispositional factors which influence both health and SWB such as neuroticism which is a source of ill-health. People scoring high in this personality trait report more symptoms and appear to feel more pain and those experiencing negative mood states including anger and depression may be more susceptible to cardiovascular problems. Stress may be a second linking factor; excesses of the stress hormone cortisol may lead to high blood pressure and diabetes while happiness helps to regulate hormone levels. Thirdly, unhappiness is known to be linked to health behaviours with unhappy people being more prone to overeat, drink and smoke, for example (Lyubomirsky et al. 2005; Cacioppo and Patrick 2008; Diener and Biswas-Diener 2008).

2.4.2 Socio-demographic factors

The socio-demographic factors described in this section, with the exception of education for the reasons described, are controlled for in the multivariate analyses. Socio-demographic factors typically account for just a small amount of the variance in SWB. Diener et al. (1999) in their review of relevant research find that between 8% and 15% of the variance in life satisfaction can be explained by age, sex, income, ethnicity, and so on. Heady and Wearing (1989) describe the relationship between socio-economic status and life satisfaction as "much smaller than the uninitiated would expect" (p. 735). Indeed, socio-demographic factors play a small role in Layard's "big seven" factors for happiness which include family relationships, financial situation, work, community and friends, health, personal freedom and personal values (2005). Nonetheless, many socio-demographics are common correlates of connectedness as well as SWB, and are thus important controls in the analysis.

Unemployment has a strong detrimental effect on SWB (Clark 2003, Diener et al. 1999, Argyle 2001), also predicting greater distress and higher rates of suicide (Oswald 1997). The effect of unemployment remains strong and significant once income is accounted for, meaning the effect on SWB is non-pecuniary (Clark and Oswald 1994) and this is likely to come about through a loss of self-esteem and self-respect (Kessler et al. 1988).

The nature of the relationship between age and SWB is not constant across research designs. Some find that age brings about a slight increase in life satisfaction, but decreases in positive and negative mood (Heady and Wearing 1989) while others find no change in life satisfaction across the life course, just a slight decrease in positive affect (Diener et al. 1999). Other accounts describe the age-life satisfaction relationship as U-shaped, with a dip in the middle years (Blanchflower and Oswald 2004). The married are found to be more satisfied than the

never-married, widowed or divorced (Argyle 2001), although the size of effect may be contingent on age, suggesting that satisfaction depends on how typical the situation is for the age group (Diener et al. 1999). More generally, living alone is detrimental to SWB (Nieminen et al. 2010).

There is a social class gradient to SWB, with those in professional and managerial occupations being happier than those in intermediate or lower occupations (Argyle 2001). Persistent class differences are also seen in the distribution of social capital (Hall 1999; Li et al. 2003; 2005). Gender is a further factor that may confound the results, as women are on average slightly happier than men (Argyle 2001) as well as exhibiting different patterns of friendship formation to men (ibid) and different rates of participation in voluntary associations (Li et al. 2005). In addition, women have been shown to be both a greater source and a greater consumer of social support (House et al. 1988).

Education is often cited as a positive contributor to SWB but the effect seems to disappear when confounding variables such as income are accounted for in the analysis (Diener et al. 1993) and may even become negative (e.g. Shields et al. 2009). This negative effect may come about because education raises aspirations; Clark and Oswald (1994) find the highly educated to be more distressed than the less educated when faced with unemployment, for example. Because education is subject to confounding with class and income, it is not included as a control in the analysis.

2.4.3 Happiness as a stable trait

Cross-sectional research design is widely acknowledged as being unsatisfactory in the study of SWB (e.g. Suh et al. 1996; Diener et al. 1999). Without time series data it is difficult to determine the direction of causality among the correlates of SWB. For example, does marriage cause happiness or are happier people more likely to get married? There is a wide and expanding literature using longitudinal studies, which has added greatly to the knowledge and understanding of what makes people happy. Throughout much of the research on happiness are patterns of reciprocal causality. We need good health to be happy, but happiness keeps us healthier. Likewise, it appears that happiness and social relationships are a “two-way street” (Diener and Biswas-Deiner 2008, p. 66); happiness can lead to more social relationships as people prefer to form friendships with happy people, and happy people may be more willing to make efforts to stay connected.

Correlations over time within individuals provide strong evidence of happiness as a stable trait. In a study of around 60 subjects measured at two time points 4 months apart, Argyle and Lu

(1990a) found that their model could explain two thirds of the variance in happiness at Time 2 based on happiness at Time 1. Costa et al. (1987) emphasise the predictive power in comparison to socio-demographic factors and conclude: "…we can predict future happiness far more accurately from measures of past happiness than from such significant life circumstances as marital status, sex, race, or age…. Stability thus appears to be attributable to enduring dispositions." (p. 304) This 'disposition' has been demonstrated in genetic terms; a study of twins raised together or apart enabled genetic and environmental effects to be disentangled and showed that 40% of the variance in positive emotionality, 55% in negative emotionality, as well as similar levels for social closeness, can be explained by heritability. The authors reason that these estimates are likely to be on the low side due to the presence of measurement error, and conclude that genes have a greater influence on these traits than environmental factors (Tellegen et al. 1988).

However, despite Costa et al.'s (1987) assertion that environmental factors are far less important than disposition, there is room for interpretation. Life events over nine years may exert little effect but shorter-term consequences of events including job loss, divorce, marriage are not captured with such a study design. The outcomes of interest were positive and negative affect, while the effect of life changes on evaluative measures of well-being remained unexplored. In short, despite evidence of a stable component to SWB, it is inaccurate to think of it of fixed, or as unresponsive to life events and circumstances. In their influential analysis of the effect of life events, Heady and Wearing (1989) concluded that "…there is both considerable stability and considerable change in SWB…" (p.734; also see section 2.4.3). The genetic case may be overstated where the outcome of interest is life satisfaction. The possibility for change is evidenced by year on year correlations between the life satisfaction of panel survey participants; the correlations between any two consecutive years is around 0.5 but over 10 years is around 0.3 (Ehrhardt et al. 2000).

2.4.4 Personality

While the stable trait and genetic approach consider the tendency to be happy as the disposition itself, there is also support for the idea that happiness stems from personality. Personality is usually assumed to be a stable trait in adulthood, with stability slightly lower for younger adults (Suh et al. 1996). It is clear that strong associations between SWB and personality traits exist. The most studied aspects of personality in this respect are neuroticism and extraversion, likely because they have been consistently studied for the longest time among the array of personality measures (John et al. 2009). Extraverts are happier, and neurotics less happy and these personality traits still exert an influence on SWB measured 10

years later (Mccrae and Costa 1991). As well as a lower average, neurotic people also exhibit greater variance in the level of SWB, bigger mood swings and less stability than others (Diener et al. 1999). Correlations between trait scores measured at 6 years apart ranged from .73 to .86 (McCrae and Costa 1991). In a fuller examination of the 'five factor model' of personality (the five factors are defined in Chapter 4, section 4.5.1), it is shown that, in addition to the well-documented effects of neuroticism and extraversion, openness is linked to experiencing more positive and negative affect but not to overall happiness. Agreeableness and conscientiousness, like extraversion, are linked to lower negative affect, greater positive effect and greater life satisfaction. Multiple regression shows that all five factors have independent relationship with SWB (ibid).

Strongly related to social support and adaptation there is a body of research more explicitly focused on the psychological processes involved with coping with difficult events. Folkman and Lazarus (1980), for example, identify six styles of coping among middle-aged people which include: problem-focused, support-seeking, focusing on the positive, distancing, wishful thinking and self-blame. Wishful thinking and self-blame are often the mechanisms used by individuals high on the neuroticism scale (Costa and McCrae 1987). It has been estimated that coping style accounts for around half of the observed relationship between neuroticism and anxiety, neurotics also exhibiting far more variation in scores on the various coping scales (Bolger 1990). More generally, positive emotion is seen as a necessary resource for coping (Frederickson et al. 2003). In Graham and Oswald's (2010) framework, volatility would result from low or depleted levels of hedonic capital. Diener et al. (1999) point out that coping needs to be distinguished as a process from adaptation in its assumption that the individual takes an active role, where adaptation is considered an "automatic, passive, biological process" (p. 286).

2.4.4.1 Extraversion and SWB

Extraversion has been subject to variability in its conceptualisation and measurement. Positive emotion itself is sometimes considered as a facet of extraversion (e.g. Herringer 1998), in which case it is hardly surprising that it correlates with SWB, the two concepts overlapping in definition. More common in recent research is to use measurement scales in which all items are affect-free (Eid and Diener 2004), thus mood and personality are kept conceptually separate. However, there is no doubt that they are somewhat related; under experimental conditions influencing mood it has been shown that the 'good mood' group express more interest in social activities (Schwarz and Strack 1991), thus suggesting a bi-directional relationship between extraversion and happiness. Extraverts are happier, but happy people are more extraverted.

Extensive research has explored mediators in the relationship between extraversion and SWB in order to uncover the mechanism of effect. Neurotic people exhibit social anxiety while extraverts do less so; pleasant affect is gained from social interaction, and extraverts spend more time socialising. The SWB of extraverts is sometimes attributed to their greater social skills (Argyle and Lu 1990a; Riggio et al. 1993). However, this explains the relationship only in part. Argyle and Lu (1990b) find that social activity can explain about half of the increased happiness of extraverts, while it has been shown that extraverts are also happier than introverts when they are alone (Pavot et al. 1990). It is inaccurate, however, to assume that only extraverts enjoy socialising as introverts are also happier in social settings (Hills and Argyle 2001). The importance of social connectedness as the mechanism of effect is also supported in research by Segrin and Taylor (2007) who show that positive relationships to others (measures including items such as "I feel I get a lot out of my friendships") almost entirely mediates the relationship between SWB and extraversion, suggesting that it is not the skills themselves bringing about well-being but the social connectedness resulting from the presence of social skills. Alternative explanations include the fact that extraverts seem to experience more favourable life events while the opposite is true for neurotics (Headey and Wearing 1989) a pattern further explored below.

2.4.5 Life events

The 'dynamic' nature of SWB was emphasised in work by Heady and Wearing (1989) who conceptualised and developed an equilibrium model which includes the three elements of personality, adaptation, and life events. The theory supposes that people return to a baseline level of positive and negative affect after good or bad events occur. Their empirical analysis reveals that both good and bad events influence life satisfaction and positive affect, while negative affect is influenced only by negative events.

When trying to establish a causal link between life events and SWB a layer of complexity is added to analysis because of the apparent endogeneity of life events. Suh et al. (1996), for example, note that negative events were almost as stable across individuals as neuroticism and negative affect which raises the question of whether reports of negative events are better treated as a dispositional, rather than external, factor. This endogeneity may be explained, to a lesser or greater degree depending on the method used, by the effect of current mood on recall, and by the fact that personality traits, particularly neuroticism, alter the perception of life events (Heady and Wearing 1989).

Heady and Wearing (1989) show that extraversion is associated with more favourable friendship and favourable job events, likely due to greater sociability, being more likeable and easier to work with and so forth. Neuroticism, on the other hand, brings about more negative events associated with jobs and finance. Openness to experience is linked to both positive and negative events (positive relating to friendship, negative relating to financial matters). More generally, it seems that some people are simply more likely report events than others, both good and bad. As well as personality, other factors may influence the likelihood of reporting an event such as being young. The authors suggest that the predictability of event occurrence may be dependent on environmental or socioeconomic factors such as the level of crime and unemployment in the local area; in addition, there may be strings of events such as a new job followed by a house move. Despite this apparent endogeneity issue, life events and experiences have an influence on SWB that cannot be explained by personality alone (Diener et al. 1999).

2.4.6 Goals and values

In research exploring 'goal-based integration', it is theorised that SWB is maximised when personal goals are fulfilled, 'integration' occurring when intrinsic goals and life circumstances are matched (Kasser and Ryan 1993). Intrinsic goals are defined as being 'growth-relevant' and 'inherently satisfying', in contrast to extrinsic goals which are more focused on external goals and rewards (p. 532). People whose goals are more materially oriented experience more depression and anxiety. Heady et al. (2010) also show that material goals are harmful to life satisfaction. Again, the cross-sectional study design is not a suitable method by which to determine the causal direction. It is also feasible that low SWB may make individuals more materialistic (e.g. Matthews 1991; Ruvio et al. 2013).

Goals and aspirations in turn are influenced by values, defined by Schwartz as "…conceptions of the desirable that guide the way social actors (e.g. organisational leaders, policy-makers, individual persons) select actions, evaluate people and events, and explain their actions and evaluations" (Schwartz 1999, p. 24). One of the functions of values, according to Rokeach (1973), is as standards against which beliefs and actions are justified, which in turn enables the maintenance and enhancement of self-esteem.

Not only happiness, but income itself may be influenced by values and those prioritising money as young adults will go on to earn more in later life. However, they also go on to report lower satisfaction with friendships particularly when income is low (Nickerson et al. 2003). On the pursuit of pecuniary objectives, Easterlin (2003) summarises: "… people make decisions

assuming that more income, comfort, and positional goods will make them happier, failing to recognize that hedonic adaptation and social comparison will come into play, raise their aspirations to about the same extent as their actual gains, and leave them feeling no happier than before…" (p. 11482). Work examining the effect of early life experiences finds that the prioritisation of financial success over pro-social goals is more common among young adults with less nurturant parents (Kasser et al. 1995). In short, where priority is given to social ties, less emphasis will be placed on material goals.

2.5 Endogeneity

The sections above (2.4.2 – 2.4.6) demonstrate ways in which any measured relationship between money and happiness may be confounded by endogenous factors. Endogeneity refers to the characteristics of the individual, typically unmeasured, that can not only 'explain away' the observed relationships but also cast doubt on the direction of cause and effect. Many of the studies cited above that find a positive relationship between income and SWB are based on cross-sectional data (Such as Layard et al. 2008; Lucas and Schimmack 2009). Longitudinal studies cast doubt on the causal nature of the relationship. Di Tella et al. (2010) show with panel data that among the same individuals over a fifteen-year period, there is no relationship between income and satisfaction. Alternative causal explanations include personality traits; neurotics experience more negative life events including those classed as 'adverse financial' by Heady and Wearing (1989) whilst also having less effective coping mechanisms and lower SWB.

Taking happiness as a fixed trait, determined by genetics, suggests that the causal direction runs from happiness to income rather than vice versa. Happy people receive higher ratings from supervisors over time with obvious implications for pay increases and promotion (Cropanzano and Wright 1999). Further, happiness has been shown to precede higher incomes. Diener et al. (2002) showed that cheerfulness of college students predicted income at age 30, even when controlling for parental income. De Neve and Oswald (2012) went further and accounted for family fixed effects in the form of sibling clusters and showed that life satisfaction among adolescents predicts earnings in adulthood.

Given that happiness and fixed personality characteristics also precede features of sociability and social networks, there is a risk that any observed effect of social connectedness on the money-happiness relationship may simply reflect unmeasured characteristics endogenous to the individual. It is a topic therefore considered central to this thesis and due attention is

accorded through the selection of analytical methods to move beyond cross-sectional correlation to a more robust association between connectedness and resilience.

2.6 Bringing money and happiness together: a summary of the thesis, hypothesis and research questions

This research builds on the proposition that income brings about life satisfaction, at least in part, because of the higher status it confers and that perceptions of status influence how individuals feel about themselves (social approval, self-worth) and the environment (perceived control). It follows that alternative sources of self-esteem, worth, and control can lessen the extent to which money can influence the happiness of individuals. Social connectedness is one such other source. The overarching thesis, therefore, is that money will make a smaller contribution to the life satisfaction of the well-connected, and that being 'well-connected' involves both strong (as described in section 2.2.1 and 2.2.2) and weak ties (section 2.2.3). The detailed hypotheses are described in full in the empirical chapters; however, the general research questions are set out here, the first being:

1) Does social connectedness influence the money-happiness relationship?

The second research question reflects the strong evidence in the literature for the explanatory role of factors that may confound any observed effects of social connectedness. For example, as outlined in section 2.4.4.1, extraversion is linked to sociability and happiness, as well as to favourable life events such as getting a promotion (section 2.4.5). How can we be sure, therefore, that observed effects of connectedness are not spurious reflections of an unmeasured third cause such as personality? A focus on changing social networks provides a means to address this possible endogeneity issue, and as such adds conviction to the main argument on the role of social connectedness. The second research question is as follows:

2) What are the causes and consequences of changes in connectedness? Is it the connectedness itself, or the psychological disposition of the individual, that functions as a resilience resource?

The final research question is also intended to add robustness; specifically to provide additional evidence on the theorised mechanisms of psychological benefits. As outlined in section 2.1.1, life satisfaction is different to other SWB outcomes in that its evaluative nature encourages respondents to consider their relative social position, and it is in this self-perception that social connectedness (as described in section 2.2.3) will have explanatory power. As a complement to Research Question One, I therefore also explicitly test how social

connectedness influences the effect of relative income position. A null finding here, for example, in contrast to significant findings for the overall hypothesis, would cast doubt on the role of social standing. Research Question Three is as follows:

3) Does connectedness influence the degree to which SWB is affected by relative income position?

In summary, while the overarching hypothesis and first research question reflect the core of this thesis in its simplest form, the later empirical chapters are specifically intended to add strength to the association between social connectedness and the money-happiness relationship, and to elucidate the underlying mechanism at work.

The single outcome of interest throughout is life satisfaction, not because other conceptualisations of SWB matter less but because this measure has formed the foundation of knowledge of the money-happiness relationship in the UK. Further, it provides a source of apposite academic enquiry, there being scope to unravel the mechanisms that can explain why the threshold effect or pattern of diminishing returns does not apply to satisfaction as it does to affect and mental health outcomes. Throughout the thesis *SWB* is used synonymously with *happiness* and in doing so follows much of the literature. The phrase 'money-happiness relationship' is used as shorthand to cover the effect of income, perceived income, material well-being and so forth on subjective well-being.

Chapter 3. Data and methods

3.1 Introduction: the importance of time-series data

The data and methods selected are those I determined to best allow me to address my hypotheses concerning connectedness and resilience. They are expected to facilitate the depth of the investigation, to allow conclusions not just on the relationship between variables but also on the mechanisms at work, and with attention to possible confounders. As noted in the introduction, many resilience researchers reject the 'trait model' that rests on simple correlations between outcomes and resources for its circular logic, and assert that a 'process model' should be assumed in which outcomes are compared before and after a stressful event (Zautra et al. 2010). In following this assertion, it is required to have repeated measures from the same individuals at different points in time in order to comprehend the changes that occur in the outcome in both the presence and absence of a given stressor.

As well as addressing the criticisms levelled at researchers of resilience, the use of repeated measures means that the clustering of responses within individuals can be taken into account. Sometimes labelled as 'unobserved heterogeneity', clustering suggests the presence of an unmeasured confounder such as the happiness set-point or personality which is likely to be fixed in nature. The data selected here contain enough repeated measures for each individual so that variation in financial circumstances (some observations in good times, others in bad) and variation in connectedness are available to provide information on the effects of each of these whilst accounting for unobserved heterogeneity at the individual level. These features of longitudinal data have significant implications for the conclusions that can be drawn, namely that where changes in connectedness are observed within an individual, it allows the empirical separation of connectedness from the person, so that the effect of connectedness can be isolated.

This chapter is divided into three main sections. Firstly, in section 3.2, it describes in some detail the data with attention to potential sources of measurement error and the checks in place to minimise bias. Section 3.3 describes the operationalization of the three core concepts in the research, namely financial circumstances (the stressor), connectedness (the resilience resource), and subjective well-being (the outcome). In 3.4 the analytical methods are described. The latent variable approach used for connectedness is described along with the operationalization of connectedness in section 3.3.3, while the methods for exploring SWB are

in 3.4. The chapter concludes with a summary of the methods in each of the four empirical chapters.

3.2 Data - The British Household Panel Survey

The data used throughout this research are taken from the British Household Panel Survey (BHPS), a survey carried out by the Institute for Social and Economic Research (ISER) in the UK between 1991 and 2008 with the aim of expanding our understanding of social and economic change (Taylor et al. 2010). The waves selected for this analysis are the final seven waves of the BHPS, before it was merged into Understanding Society, from 2002 to 2008. There are several reasons for choosing these years. Firstly, it is a range of years (after the final extension sample in 2001, see below) in which no large changes to the sample or the method of data collection occur. Life satisfaction was asked in a consistent manner in each of these seven waves, and this period also provides at least two measurement occasions for social connectedness, which, as part of the rotating core of questions, does not feature in every wave. It is also a sample large enough to observe enough variation in connectedness and financial circumstances within the lives of individuals to allow for a robust analytic approach to answering the research questions. Despite the inclusion of just the later waves, the following description begins at Wave One so that all the relevant sampling details are captured.

3.2.1 The Sample

The survey began in 1991 with a sample of households, in which all adults were interviewed, that was representative of Britain south of the Caledonian Canal. A two-stage clustered probability design was used; at the first stage 250 postcode sectors were selected using systematic sampling intervals from a list of all postcode sectors which had been ordered by region and key socio-demographic factors. At the second stage a random selection of addresses was taken from each. An initial sample of 8,252 addresses was identified with the aim of a final sample of 5,000 households after excluding non-residential addresses and institutions and taking into account an estimated response rate. The response rate for Wave One was slightly higher than expected at 74% resulting in a sample of 5,511 households containing 13,840 individuals.

At Wave 9 (1999) Scotland and Wales boost samples were added, followed, in Wave 11 (2001), by a new sample for Northern Ireland. From 2001 onwards, therefore, the sample covers the whole of the UK. From Wave 11, cross-sectional respondent weights are available so that Scotland, Wales and Northern Ireland are adjusted to make up the expected proportion of the population; weighting also corrects for unequal sampling probabilities and non-response

within households. Weights were applied where apposite in the analysis and therefore results are interpretable as being representative of the UK in the early 1990s[2] (Taylor et al. 2010). Survey participants were re-interviewed every year. However, as is illustrated in Figure 3.1, the sample does not remain static year on year in terms of the individuals taking part. Individuals may appear or disappear from the sample for several reasons, not least of which is sample attrition, the consequences of which are considered in greater detail below. New panel members are added for the following reasons: children in an existing sample household turn 16, new people move into the household of an original sample member (OSM), or an OSM moves into a new household. When an OSM moves they are followed, and any new co-inhabitants are interviewed but only for as long as they remain in the same household as the OSM. Overall, due to the rate of attrition being slightly higher than the addition of new panel members, the sample size decreases by between 200 and 500 per wave. The new members in each wave make up an average of 6%, and those dropping out 9%, of each year's total sample.

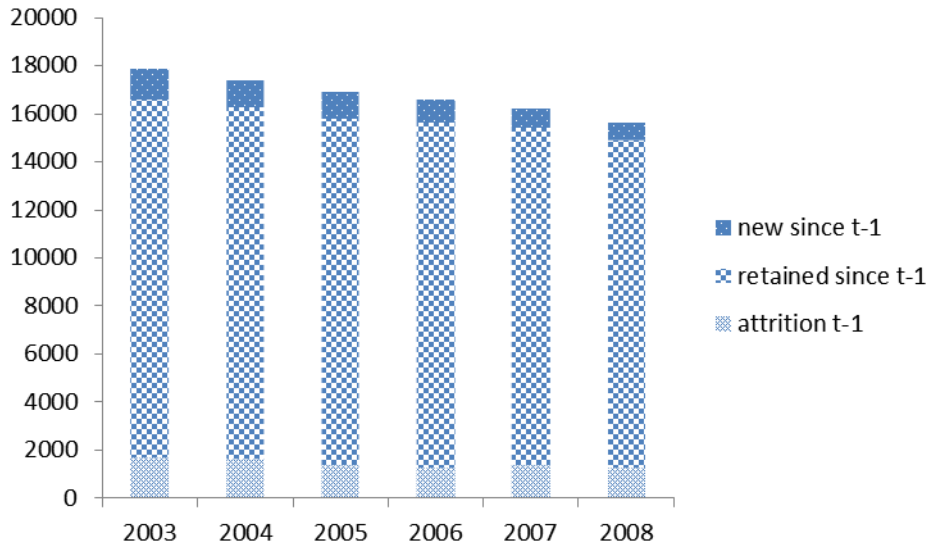


Figure 3.1 Sample size per BHPS wave between 2003 and 2008 showing new members and those dropping out.

[2] The sample cannot be considered representative with respect to the population changes which have taken place in the UK since then, with the under-representation of the ethnic minority population being one notable aspect. Ethnicity, however, is not a variable of special interest in this research and the understated ethnic composition is not expected to influence the results or conclusions drawn.

3.2.2 Data collection and structure

The survey consists of a short household questionnaire, taking around 10 minutes to complete, which is administered to just one adult in the household who provides information on matters including household tenure and patterns of consumption. This is followed by the individual schedule which is administered to each adult in turn, taking an average of 40 minutes each, covering core topics including labour market activity and income. Finally, each adult does the self-complete section, which takes around 5 minutes, and includes questions that may be more sensitive to bias in the presence of others and is the source of the variables on connectedness and subjective well-being.

The data are available in several different record types reflecting the structure of the questionnaires, for example “household respondent” and “individual respondent”. Records are matched across record types and across waves through the key variables. The person ID remains fixed across waves, and is used to combine multiple waves into a single record. Household ID is not fixed across waves, but allows the matching of household level variables to the individual within each wave (Taylor et al. 2010).

3.2.2.1 Data Quality

Given the method of data collection, the reliability of any data point is dependent upon the respondents’ interpretation of the question and willingness to answer, and the interviewers understanding of the response. While measurement error may be considered an unavoidable aspect of social data, the risk of error is minimised by procedures put in place by ISER. The practices to ensure data quality include interviewer training, questionnaire design, maintenance of the relationship with respondents, and data cleaning. The same interviewer, for example, goes back to the same households in each wave, thus allowing a rapport to be built which maximises cooperation (Taylor et al. 2010).

3.2.3 Attrition, missing data, and the potential for bias

In addition to the risk of non-response and missing data that is applicable to all survey data, panel surveys also carry the risk (and added complexity) of survey attrition. Attrition is the process of an individual or household leaving the panel resulting in the absence of data, which may be viewed as particularly problematic in long-running panels where non-response is cumulative over waves and a potential threat to the representativeness of the sample (Lepowski 2002). The rate of attrition is highest in the first five waves of the BHPS (Uhrig 2008).

Although panel studies may be seen as particularly problematic in this respect, they also offer the opportunity to explain attrition based on situational factors and respondent characteristics

recorded in earlier waves. Using such an approach, it has been shown with BHPS data that physical barriers are strongly associated with the probability of non-contact such as a lack of access to flats, geographical mobility and poor health of the respondent. The factors from Wave One that predict non co-operation at Wave Two are slightly different to those influencing non-contact, and include household size and being in employment perhaps due to greater burdens on time (ibid.).

The generalisability of results drawn from analysis of panel data is threatened to the same degree that the factors bringing about attrition also influence the factors under investigation. It is particularly salient here, therefore, to consider whether the core factors in this research (namely subjective well-being, financial circumstances and connectedness) are predictive of attrition. Income, firstly, is not a particularly good indicator of subsequent non-response. Households with very high incomes are harder to contact but there is little impact on the refusal rate. Financial stress, perhaps counter-intuitively, appears to make non-response less likely in Wave Two; it may be that the vouchers received for participating act as an incentive when money is tight (Laurie et al. 1999).

Perhaps of particular salience is evidence on the role of social connectedness and SWB in predicting attrition. In their exploration of two well-known panel surveys in the USA, Lepowski and Couper (2002) find that both informal socialising (including talking on the phone and perceived support) and formal social activity (attending meetings, being politically active, and volunteering) can predict cooperation at later waves. This is confirmed by analysis of the BHPS which shows that 'omnivorous social engagement' in organisations reduces both the probability of non-contact and non-cooperation (Uhrig 2008). As cooperativeness and the ability to express oneself, as rated by the interviewers, are similarly predictive of continued participation, we must also consider personality traits to be potential confounders of survey participation and social connectedness. With regard to SWB, it seems that having lower well-being is predictive of later non co-operation (ibid.) suggesting that the sample used here, restricted to later waves, will be slightly happier than the national average.

3.2.3.1 Missing values

Data from the BHPS are coded with a consistent set of values which allow analysis of the reasons for missing values, and therefore, to consider potential bias to the results of the analysis. The largest numbers of missing values of the variables central to this research are due to the completion of the survey by proxy or by telephone. This situation arises when household members are absent throughout the field period, or when too old or infirm to take

part, and instead of the full individual questionnaire, a shortened version is completed by another member of the household. As the self-complete module is not administered in these cases, this means that connectedness and SWB measures are always missing and excluded from the analysis. Analysis has shown that proxy completion is predictive of later non-contact and non-response (Uhrig 2008), and so the risk factors of attrition may also be applicable to this sub-sample. Also excluded are those refusing the question, answering as 'don't know' or where the entry appears to be inaccurate or wild; these tend to be smaller in number.

Where the factors that influence attrition and missingness are also observed in the data these are used as controls in the multivariate analyses. These factors coincide with the correlates of SWB in many cases and include, for example, employment status and age. The relationships between the dependent and independent variables can therefore be considered fairly robust despite the known patterns of attrition. Despite this, however, and even after applying weighting to the cases in the analysis, it is likely that point estimates of the proportion of the population who are socially isolated will be low, and that estimates of the very social will be exaggerated compared to the general population. Similarly, if the very unhappy are more likely to leave the panel, those experiencing low resilience in the sense of large drops in SWB may also be under-represented in the sample. The statistical models are estimated under the assumption of Missing at Random (MAR) which offers some protection against bias from missingness.

3.3 Operationalizing the components of resilience

3.3.1 The stressor: financial circumstances

In the resilience framework (see Figure 1.1, Chapter 1), the stressor or 'shock' that can disrupt the SWB of individuals is their financial circumstances. In operationalising this, it is necessary to include several concepts which together provide a fuller picture of the circumstances that are influencing SWB. The three variables are selected based on the money-happiness literature and include both objective and subjective items. The objective measure by-passes the potential criticisms that subjective income and subjective well-being may be confounded by personality, mood and the individual set-points and aspirations. On the other hand subjective measures can capture a more complete reflection of circumstances which take into account the full range of contributing factors, some of which may be unmeasured.

The objective indicator used is household income. Income is the most commonly studied variable in the economic and sociological literature, and in keeping with this tradition this study can gain from, and feed back into this well-established body of work. In practice, the

measurement of income contains potential sources of measurement error. Firstly, income is viewed as personal data and as such is susceptible to non-response and under-reporting. Certain groups may be particularly prone to this such as the self-employed (Jenkins 2010) and those on benefits (Belfield et al. 2014). Secondly, sources of income other than job earnings need to be included such as welfare benefits and returns on investment which may constitute considerable proportions of income for some. The data collection and imputation procedures used in the BHPS address these points. Where possible, the interviewer verifies income data with payslips, or the latest accounts of the self-employed, meaning that under- or over-reporting is limited and consistency is achieved in reporting gross and net figures. Payslips are seen in approximately one third of cases (Jenkins 2010) suggesting that despite the rigorous processes, there is still considerable room for error. The high and low ends of the income distribution in particular may result from measurement error or false reporting (Brewer et al. 2013; Layard et al. 2008) and this is considered further in the empirical chapters.

Monthly income is chosen for analysis in preference to yearly income. It better reflects income at the time of the survey, which is particularly salient given the research questions which address reactions to current and recently changed financial circumstances. The question is worded to elicit 'usual' monthly income, and in the event of the most recent payment being anomalous due to some one-off reason, the figure recorded will be the more regular income amount. In practice it may be that the distinction between annual and current income is a minor one and indeed the two are correlated at above .9 (Jenkins, 2010). This composite household income variable is available at every wave.

Income is a highly sensitive subject for many and the non-response is correspondingly higher than on other topics (Uhrig 2008). The variable for monthly income in BHPS is derived from all income sources where divulged (including income from investments, labour, benefits and pensions) from all household members. Imputation procedures are applied by the ISER team, with the aim of minimising the bias that would be unavoidable in any analyses where cases with missing data are dropped. It is important that household aggregates are not lost due to the missing data from one particular household member. The imputation procedure is regression-based, and uses predictor variables of current income including income at previous waves where available and other relevant factors (Taylor et al. 2010). Across the seven waves used throughout the thesis, between 34% and 49% of cases have a total household income figure that has been derived with the use of imputation. This is made up of cases (14%-31% in each wave) which have partially imputed household income totals, where information was

received on some income streams but not others, and individuals (17%-20%) for whom income had to be imputed entirely. This high level of imputation is offset by the advantage that non-response bias is kept to a minimum.

3.3.1.1 Income transformations

A number of conversions are applied to the income variable in order to increase comparability across households and time, and to correct for the non-normal distribution (see Figure 3.2). Firstly, as the analysis explores patterns of observations over time using waves beginning in 2002, income from the subsequent six waves are deflated to 2002 values to ensure comparability. The conversion rates are based on the retail price index (RPI). The RPI is calculated based on the costs of goods and services in a given period and is therefore a measure of inflation as it affects consumers. The index is calculated and released by the Office for National Statistics (2011) and summarised by Officer and Williamson (2015); the conversion rates used are shown in Table 3.1.

Deflation rate to 2002 prices	
2008	0.820
2007	0.853
2006	0.890
2005	0.918
2004	0.943
2003	0.972
2002	1

Table 3.1 Conversion rates to 2002 £; Source MeasuringWorth (Officer and Williamson 2015)

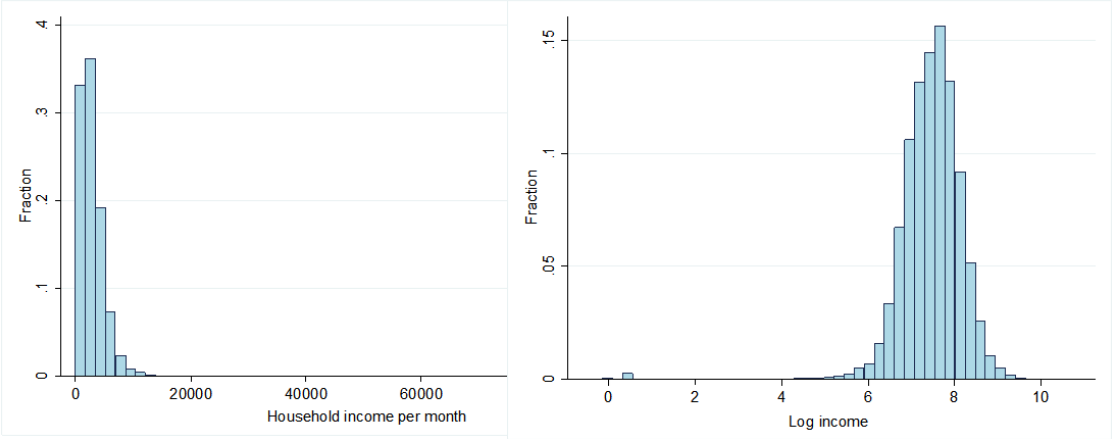
After deflating to 2002 pounds sterling, a second conversion is applied which is to equivalise income across households. The aim of this procedure is to make household income a directly comparable measure over households of different size and composition, and therefore also across different years where changes in the household may have occurred. The conversion factor provided in the BHPS is the McClements Equivalence Scale (Taylor et al. 2010), a well-established scale based on the assumption that each additional person in the household raises costs. The 'base' household is two adults with no children. Thus, for example, the effect of equivalising for a single person is to inflate their income by a factor of 1.6, while the income of a couple with one child aged between 5 and 7 is decreased by a factor of 0.83. The equivalence

scale includes different expected costs depending on the number of adults and children as well as on the age of the child and is shown in Table 3.2.

McClements Equivalence Scale (before housing costs)	
Head	0.61
Spouse	0.39
Other second adult	0.46
Third adult	0.42
Further adult	0.36
Dependent child aged:	
0-1	0.09
2-4	0.18
5-7	0.21
8-10	0.23
11-12	0.25
13-15	0.27
16+	0.36

Table 3.2 Conversion factors for adjusting household income to be equivalent by household composition; table based on Taylor et al. (2010)

Thirdly, the distribution of household income is heavily skewed to the right with a long tail representing a small number of households with very high incomes. To correct for this distribution the variable is transformed by taking the natural logarithm. There are 103 (0.2% of the sample) observations where the monthly income is below £1. In order to avoid generating missing values during the log transformation, these observations are recoded to take a value of 1. These observations are likely suspects for measurement error, the effect of which is considered in later chapters. As well as correcting the distribution in a purely statistical sense, the use of log income as a predictor variable assumes marginal utility which is to say that returns on SWB diminish at the higher end of the income scale. Log income is used almost invariably in preference to the raw figure and better represents the shape of the relationship (Stevenson and Wolfers 2008; Wolfers et al. 2013). Thus empirical support is provided that this is an appropriate way to analyse the effects of income.



Income distribution before transformations

Income distribution after transformations

Figure 3.2 Distribution of household income before and after log transformation; 2002-2008, N = 101,938

3.3.1.2 Subjective financial situation

The fact that household income is error-prone means that it may be a poor proxy for the financial resources available to the household, and consequently a poor foundation on which to base conclusions about resilience. For that reason, subjective measures of financial situation are taken to be an indicator of the level of financial stress. It is likely that survey respondents consider savings and assets, rising or falling costs, family circumstances, job security and so forth, thus providing a more rounded understanding of personal circumstances than income alone. The first question asks "How well would you say you yourself are managing financially these days? Would you say you are. . ."? with possible answers from the list: Living comfortably, Doing alright, Just about getting by, Finding it quite difficult, or Finding it very difficult. These are recoded to take scores 0 – 4 with 'living comfortably' as the highest score. The most frequent answers, shown in Table 3.3, are 'doing alright' (37%) followed by 'living comfortably' (32%). Of those taking the self-complete module (i.e. not the 'proxy' respondents), missing values make up just 0.1% of responses.

Subjective financial situation		
living comfortably	32,443	30.4%
doing alright	40,068	37.6%
just abt getting by	23,362	21.9%
finding it quite difficult	4704	4.4%
finding it very difficult	1946	1.8%
Subtotal	**102,523**	
Missing values		
missing or wild	7	<0.0%
proxy and or phone	3900	3.7%
refused	9	<0.0%
don't know	156	0.1%
Total	**106,595**	

Table 3.3 Frequencies of response to perceived financial situation, data from all seven waves 2002-2008, N = 106,595

Directly following, respondents are then asked how their current situation compares with last year and have three options: better off, about the same, or worse off. Unlike income, these two variables are asked in the individual self-complete module of the survey, therefore members of the same household can potentially provide different answers despite living with the same level of aggregate income. Disparity may reflect an unequal distribution of resources within the household or individual differences affecting the perception of the financial situation. From this three-category variable, I code two dummy variables for "Worse off" and "Better off" where the reference category is "about the same". "Worse off" is taken as a good proxy for a financial shock and is expected, as described in Tversky and Kahneman's (1991) loss aversion theory, to have a cost to SWB higher than the opposite benefit of a gain of equal magnitude. The most-given reasons for feeling worse off include more expenses, a decrease in earnings, and a decrease in benefits.

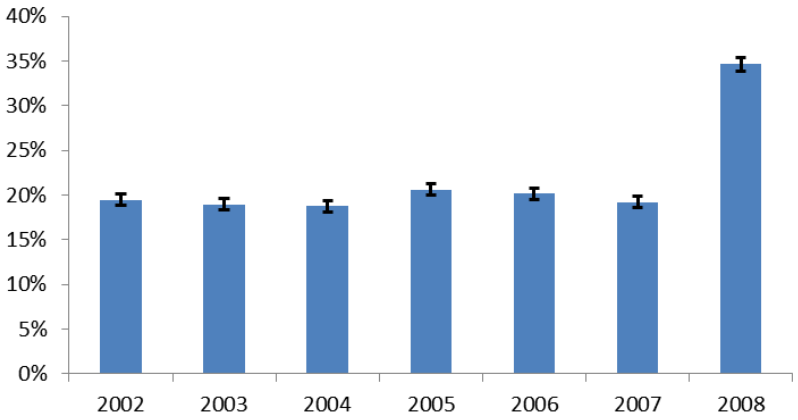


Figure 3.3 Percentage, with error bars for 95% confidence, feeling worse off in each wave between 2002 and 2008

The rate of 'worse off' increases noticeably in 2008 (see Figure 3.3) compared to previous waves reflecting the onset of the financial recession. This subjective measure is in contrast to figures from the Institute for Fiscal Studies who show that there was no change to real income in 2008 (Belfield et al. 2014). It suggests that the perceptions of being worse off may reflect insecurity in the job market and other macro-level effects in addition to objective levels of income. Nonetheless, 2008 may be an untypical year, and thus has the potential to limit the generalisability of the results. The influence of this potentially anomalous wave is considered further in Chapter Five.

	1	2	3	4
1. Financial situation	1			
2. Worse off	0.313*	1		
3. Better off	-0.203*	-0.303*	1	
4. Household income	-0.215*	-0.056*	0.193*	1

Table 3.4 Spearman rank correlations between the indicators of financial circumstances; 2002-2008, N = 99,394. * Statistically significant at p < 0.05

The degree of correlation between the financial indicators is shown in Table 3.4. The strongest correlation of -.342 is between subjective financial situation and feeling worse off indicating that habituation has a strong influence on the general perceived situation. Household income is also correlated with the subjective perception of financial position, r = .297, showing that it

has around equal weight as habituation in influencing perceptions. Feeling worse off has only a very weak correlation with household income.

3.3.1.3 Area income

As well as personal circumstances, the neighbourhood economic context in which the individual is embedded is a further source of financial stress that can influence SWB. In particular, it has been demonstrated that the average income of those living in geographical proximity serves as a reference point for social comparison. Area income figures as generated by the office for national statistics (ONS) are linked into the BHPS data set to explore the social comparison effect. In light of the decision to exclude a question on income data from the national census in 2001, and the continued need for good quality data, the ONS commenced the Small Area Income Estimates Project (SAEP). The project resulted in a set of model-based estimates of average income by area in England and Wales. The estimation procedure consisted of two steps. Firstly, area-level covariates of government administration data and census measures of the proportion in managerial and professional occupations, proportion of over 65s claiming pension credits, and so forth, were regressed on household income from the Family Resource Survey conducted in 2007 by the ONS for this purpose. Secondly, once the relationship between the area factors and income had been reliably established, they were then used to construct estimates of average income for the area (White et al. 2011).

The “small area” level concerned in the SAEP was the Middle Super Output Area (MSOA) which is a geographical unit, of which there are 7,194 in England and Wales, each containing an average population of 7,200 (ibid.). The ONS used MSOAs in preference to wards to be synchronized with government geographic and statistical policy. This means that in Chapter Seven that the analysis is restricted to England and Wales, rather than the entire UK. The benefit of using the SAEP estimates for this restricted part of the UK is that they have been produced by a single governmental office and thus no risk is introduced of inconsistent measures between the countries of the UK. The benefit of using these estimates is that the FRS survey was conducted in a period closely overlapping the penultimate wave of the BHPS, meaning that the concurrence of the personal and area income is assured. The average weekly income in MSOAs ranges from £250 to £1,190 with a mean of £450.

3.3.2 The resilience resource: connectedness

Two variables are used as measures of strong ties. Firstly, the BHPS asks respondents to mention up to three friends with the question wording as follows: “Here are a few questions about your friends. Please choose the three people you consider to be your closest friends

starting with the first friend. They should not include people who live with you but they can include relatives." There follows a series of questions such as "Is this person male or female?", "is this person a relative?" and so forth. The number of friends is not provided by the respondent and I therefore construct a variable by taking a count of non-missing responses to the male/ female question for friend one, friend two, and friend three. The result is a single variable taking possible values from zero to 3. The majority, 83%, mentioned three friends, 7% mentioned two, 5% had just one friend and 5% could not name anyone outside the household. The 5% naming no-one are individuals who completed this part of the survey (i.e. not proxy completions) but who left the answers to these questions blank. Some measurement error must be assumed here as it is likely some respondents may have skipped the questions due to a lack of time or interest in the survey. However, as the survey is designed to mitigate this risk with no personal details about the friends requested (Gray et al. 2008) these observations are retained for analysis and taken at face value.

Secondly, social support is considered here as an indicator of the quality of the relationships, by capturing the extent to which the ties provide emotional support. The BHPS includes a battery of five social support questions where the respondents are asked whether there is anyone available:

1) who will listen
2) who will help in a crisis
3) to relax with
4) who really appreciates you
5) you can count on to offer comfort

There were three possible answers of no-one (0), one person (1), or more than one person (2) which are averaged into a single score. The 5 items have a Cronbach's alpha of 0.86 and so are suitable for treatment as a single scale[3]. Before averaging, a multiple imputation procedure was applied to compensate for the possibility of respondents ignoring the questions they found harder to answer thus potentially elevating their mean score. The resulting mean score is on a scale of 0-2, with higher scores representing a higher level of perceived support. The sample mean social support is 1.68, with a standard deviation of 0.43. The distribution is skewed to the left with almost half the sample having the maximum score of 2.

[3] It is possible that this high Cronbach's alpha score masks two or more highly correlated latent factors of support. However, the requirement is to achieve a reliable indicator of the 'quality' of close ties and the alpha supports the use of these items to address this end.

Secondary or weak ties are indicated through activity with organisations using a question on activity in a range of organisations including the following: political party, trade union, environmental group, parents' association, scouting or guides, residents group, voluntary service group, community or social group, women's group, pensioners' group or professional organisations. The variable of interest captures *activity* rather than *membership* to avoid counting what have been called 'check-book members' where membership may not involve any social interaction (Putnam 2000). Additionally, the respondents are asked about the frequency of attending various activities including volunteering and community groups, and this is combined into a single indicator (described in more detail in Chapter 4).

As highlighted by the literature on attrition, and shown in Table 3.5, it seems that those with fewer social connections are more likely to leave the panel; 87% of those who name no friends are still participating four years later compared to 94% of those naming three friends. Similarly, 94% of those not active in any type of organisation stay in the panel, compared to 96% of those active with 2 or 3 types of organised social group. Whilst this confirms the concerns raised by the attrition literature, it also alleviates them to some extent. The difference in retention rates between the most and least civically engaged is 2.4%, and between the isolated and the non-isolated 7%. These differences are taken to indicate that the assumption of generalisability is not entirely invalidated, but that the level of isolation in society will be a conservative estimate.

	2004		Still in panel 2008	
	friends	**organisations**	**Friends**	**organisations**
	%	**%**	**%**	**%**
0	4.6%	50.9%	87.4%	93.7%
1	4.8%	30.6%	89.3%	94.6%
2	7.5%	13.6%	91.8%	95.7%
3	83.1%	4.9%	94.1%	96.1%

Table 3.5 Percentages of sample, 2004, by number of friends and organisation, and the percentage by category still in the panel in 2008. Friends N = 14,196, organisations N = 13,428

3.3.3 Measuring connectedness: latent class analysis

Latent variable analysis is popular in the social sciences because of the inherent difficulty in measuring some central concepts of interest such as personality, prejudice, or anomie. I treat connectedness as latent for two main reasons. Firstly, the states of connectedness

hypothesised to be particularly relevant for explaining psycho-social resilience include "isolation" and "social integration". These are *hypothetical constructs* and, as noted by Skrondal and Rabe-Hesketh (2004), correspond to inherently unobservable phenomena and therefore cannot be measured directly. The measures of connectedness used in this analysis (described above) are taken here to be *indicators* and are assumed imperfect markers of our unobservable construct. Secondly, then, a separate advantage of a latent variable approach is that it serves as a way of accounting for measurement error, as the modelling outputs include indicators of measurement quality (Skrondal and Rabe-Hesketh, 2004; Hagenaars and McCutcheon 2002). Measurements of the indicators of connectedness are likely to contain error resulting from, for example, variation in the interpretation of the word "friend" which is known to vary by culture (Cacioppo and Patrick 2008) and by social class (Allan 1998).

Like other latent variable methods, LCA can be considered a data reduction technique; but, of more relevance here, it is also as a way of adding to the interpretability of data based on several different variables (McCutcheon 1987). LCA is founded on the assumption that the interrelations between the observed variables can be explained by the latent construct. It is by studying those patterns of interrelations through the modelling procedure that the nature of the underlying classes can be characterised (ibid.). LCA is similar to more traditional methods, such as *k*-means cluster analysis in its aim of finding a manageable number of homogeneous groups using two or more observed characteristics. It does, however, differ from cluster analysis in its statistical approach bringing several advantages (Magidson and Vermunt 2002). Firstly, the outcome of a cluster analysis is dependent upon the scale of the manifest variables and is limited to interval data, whereas LCA can deal with any combination of ordinal, nominal or continuous measures[4]. Secondly, LCA methods provide diagnostic statistics which are valuable for model comparison and to determine the number of classes. Additionally, the maximum likelihood approach provides estimates for the classification quality. Simulation studies have shown that LCA performs better than alternative techniques such as *k*-means clustering in the rate of misclassification (ibid.). In Chapter Four, I estimate single latent categorical variables (with more than one category) separately for two time points and in Chapter Six, a longitudinal analysis, two latent variables (one for each measurement occasion) are estimated simultaneously (see 'Latent Transition Analysis' section below).

The latent class and transition models assume the 'axiom of local independence' which postulates that the observed correlations between the manifest variables are fully explained

[4] The modelling of continuous indicators is sometimes known as latent profile analysis, but here I follow Meeus et al. (2010) in treating LCA as an umbrella term which covers all types of dependent variable.

by the latent variable. This assumption is tested; there is no correlation between the residuals of the dependent variables. LCA uses the patterns of responses to group cases (people), in a probabilistic manner, into classes, based on similarities and dissimilarities in question responses. The assignment of a class to each individual is based on the class with the highest probability of membership. In this assignment to classes, latent class models characterise individuals as having different types of connectedness. The LCA model assumes that the measurements of social connectedness can be used to classify individuals into a typological structure, and that the manifest measures used in the analysis serve as (imperfect) indicators of our theoretical concept. A common cause relation (Borsboom et al. 2003) is assumed which is to say that an individual's unobserved state of connectedness is causally prior to the observed variation in the manifest variables.

The 'latent nature' of variables can be category-like or dimension-like (De Boeck et al. 2005), with LCA being appropriate for the categorical nature of states of connectedness of interest such as 'integrated' versus 'isolated' and so on. This is in contrast to the dimension-like 'factors' which would result from factor analysis, for example. There are several examples in the literature which treat connectedness, networks, or social capital as 'types' rather than a scale and these are referenced in a discussion of the justification in Chapter Four.

This method offers two further benefits; firstly, that cases with missing values on one or more indicators are not excluded from the analysis thereby minimising bias from non-response. Secondly, covariates can be added to the model to explore the socio-demographic profiles associated with membership of individual classes. Doing so in the structural equation modelling framework, the so-called MIMIC model (multiple indicators, multiple causes), means that uncertainty in class assignment can be taken into account (Bolck et al. 2004).

3.3.3.1 Statistical procedure

The modelling output includes three sets of parameters of interest for substantive interpretation and the testing of model assumptions. Firstly, the latent class prevalences, namely the number of cases assigned (probabilistically) to each class. Secondly, the conditional probabilities of a response to the indicator variables, given membership of that class, are estimated. Thirdly, the residual variances for each of the indicators are estimated.

These parameters are estimated using the maximum likelihood approach, an iterative statistical procedure that seeks to find the most likely parameter values in the model for which the data are most likely to be observed. The log of the likelihood is used in practice and is interpreted as a measure of probability of the observed data occurring given the model

(Agresti 2007). The statistical software package Mplus (Muthén and Muthén 2007) is used to estimate the latent variable models, where the particular method applied is the 'expectation-maximisation' algorithm (EM) in which the log-likelihood is estimated for the current parameter estimates (the E step) and then, the parameters are re-computed based on maximising the last E-step log-likelihood (the M step). This is repeated iteratively to find the solution with the largest log likelihood value. An issue particularly relevant to LCA models is the possibility that a single set of start values may not lead to the best possible log likelihood value but instead stop at a 'local maximum' in which case the fit statistics and parameter estimates may be biased (Collins and Lanza 2010). To overcome this potential source of error in the LCA, I increased the number of random starts to 2000 which resulted in 9 replications of the best log likelihood values in the Time 1 model and 7 replications in the Time 2 model[5]. The solution, replicated from different start values, indicates that local maxima are unlikely to be biasing the solution, and the parameter estimates and stability of the model are therefore taken to be robust.

I follow the typical approach used for developing an LCA model which is to run a number of models with different numbers of classes specified and then compare the relative fit of these models using the log likelihood and derived fit statistics. I examine both the Akaike's Information Criterion (AIC) and Bayesian Information Criterion (BIC) which take into account goodness of fit (the log likelihood) and parsimony in terms of the number of parameters in the model. Smaller values of the information criteria represent a more optimal balance between fit and parsimony and are therefore preferred (ibid)[6]. The BIC imposes a harsher penalty for the number of parameters than the AIC, and thus has a stronger tendency to prefer models with fewer classes. In practice however, both the AIC and BIC point towards the same model selection (see Chapter Four).

In addition to the information criteria, I also report the *entropy* of each solution, in which the average class membership possibilities are summarised into a single score. The score is a measure of how well people were assigned to classes with scores closer to 1 indicating that the classes are more clearly distinguishable and reflecting a clear delineation of the classes (ibid.). Again, in practice, this statistic makes little substantive impact on the model selection as the confirmatory nature of the models (see below) means that entropy scores are near-perfect in all candidate models.

[5] MIMIC and LTA models are run with 10000 to ensure convergence
[6] Chi-square test is not applicable for sparse contingency tables and solutions with several classes (Collins and Lanza 2010).

3.3.3.2 Confirmatory LCA

The basic structure of classes is founded on the premise, as outlined in Chapter Two, on the importance of having both weak and strong ties. A specific aim of the model is to produce a class of individuals with both types of tie, as well as classes of individuals with neither, and with just one type of tie or the other. As such, a confirmatory approach to the latent class model is taken. The main difference from the exploratory model is that a series of parameter restrictions are added that guide the nature of the classes. For example, to ensure that an 'integrated' class emerges in the solution, the model input includes constraints to the indicator scores for both weak and strong connectedness to be high for one particular class. In any given model, it is possible to apply constraints to some parameters whilst leaving others free; thus information criteria still have a role to play in selecting the best confirmatory model. The aim is to produce a solution that is both well-fitting and readily interpretable as well as providing a suitable explanatory variable with which to test the hypotheses. In confirmatory LCA, the 'interpretability' relates to the hypothesised states of connectedness and in doing so brings construct validity to the measurement instrument. I follow the guidance for exploratory analysis by Collins and Lanza (2010) and choose from among competing models by making a judgement call based upon both statistical criteria and interpretability.

3.3.3.3 Latent Transition Analysis

Latent transition analysis (LTA) is an extension of latent class analysis (LCA), and the same assumptions apply. In common with LCA, the LTA model produces parameter estimates for the latent class prevalences and the indicator means within each class. In addition a set of transition probabilities are estimated that express the way changes occur through time, and are estimates of the probability of being in a given class at Time 2 contingent upon membership of a given class at Time 1. In Chapter Six, I use the term *latent status,* this being more apt as it avoids the fixed nature implied by the term *class membership*. The emphasis of the LTA model is on estimating transitions between classes over the two time points.

The LCA model from Chapter Four provides the basis for the LTA in Chapter Six, to which two essential modifications are made. Firstly two latent variables are specified, one for each time point, with the same constraints imposed. Secondly, measurement invariance is assumed across the two time points which is realised by assigning parameter restrictions on each indicator so that the means for each class are constrained to be equal at Time 1 and Time 2. As adding an additional time point increases the size of the contingency table exponentially, the sparseness of the tables can result in model identification issues. However, parameter restrictions help to avoid this issue (ibid.), and the confirmatory approach, as described for LCA

models, is taken. The LTA includes cases with missing data at either time point (due to panel attrition and replacement, or answer refusal). Where there values are missing on all indicators at a given time the probabilistic assignment of classes is based on the class prevalences alone, which is to say that the individual will be assumed to belong in the most populous class.

3.3.4 The outcome: Life satisfaction

"Subjective well-being" (SWB), is an umbrella term and is commonly broken down into the three dimensions of positive affect, negative affect, and life satisfaction (Diener et al. 1999; Gasper 2010). The outcome of particular interest in this study is life satisfaction, which is ascertained by asking a question that demands of its respondents the act of cognitive evaluation and appraisal of life circumstances to determine a position on a scale. In choosing this conceptualisation of SWB, priority is being given to individual judgements of meaning and reflectiveness and meaningfulness are prioritised above pleasure (Gasper 2010).

Life satisfaction response type		
missing or wild	3,881	3.6%
proxy and/or phone	3,900	3.7%
refused	13	<0.0%
not answered	50	<0.0%
valid answer	98,897	92.7%
	106,741	

Table 3.6 Percentage missing by type of missing, all seven waves 2002-2008, N = 106,741

The survey question asked in each wave is worded as follows: "Here are some questions about how you feel about your life. Please tick the number which you feel best describes how dissatisfied or satisfied you are with the following aspects of your current situation". There follow eight domain specific sub-questions which are followed by "Using the same scale how dissatisfied or satisfied are you with your life overall?" The respondents then tick one of 7 boxes running from left (1 "not at all satisfied") to right (7 "completely satisfied"). The boxes between the two end-points are numbered but not labelled. Table 3.6 shows that 92.7% of cases have a valid answer for analysis. Of the remaining, the most common reason is that the survey was administered by proxy (3.7%), where the respondents did not attempt the self-complete section of the questionnaire. A further 3.6% have answers missing for another reason.

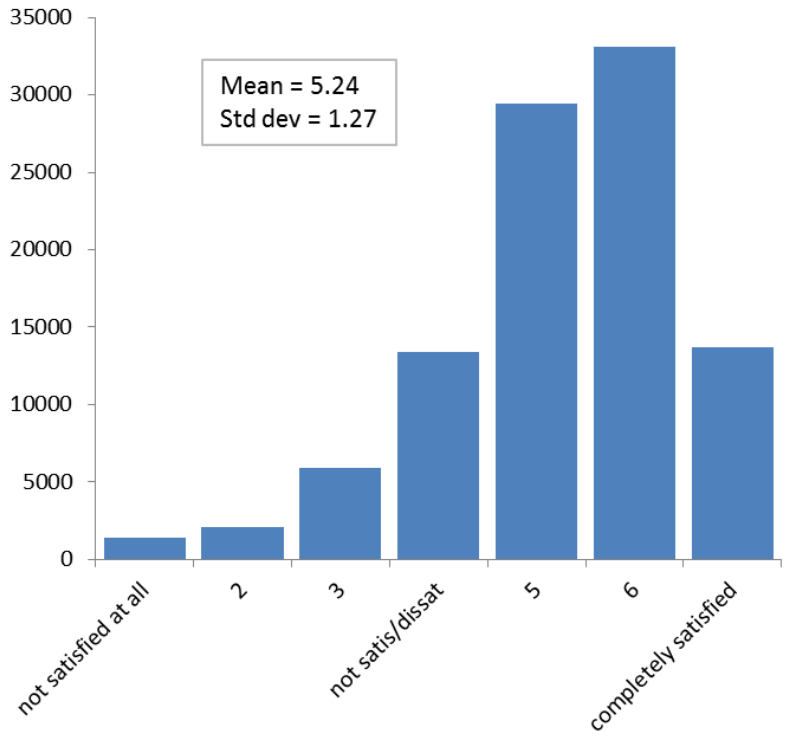


Figure 3.4 Distribution of life satisfaction responses, 2002-2008, missing values excluded, N = 98,897

Experimental survey design has shown the 7-point scale to be more reliable than the more commonly-used 10-point scale in producing a smooth distribution of responses (Pudney 2010). Figure 3.4 shows the distribution of responses to have a single mode (at 6) and fewer responses from the extreme ends of the scale. It is, however, skewed to the left with the low values of (1-3) all being less frequent than the maximum value of 7. Mean life satisfaction is 5.24 with a standard deviation of 1.27.

3.3.4.1 Measurement error

Measurement error may be expected to be a particular problem in the assessment of subjective affect-related outcomes. There is, for example, likely to be individual variation in the application of the scale to their lives, although the methods used will explicitly control for this by exploring variation in individuals over time and separating occasion variability from individual variability. Social desirability bias may be another source of error due to the reluctance to 'admit' to unhappiness. This potential source of bias is lessened as the question is administered in the self-complete section of the survey thus limiting any influence of the presence of others. There are further sources of potential error which require more detailed examination.

Firstly, the life satisfaction question seeks to measure the cognitive, self-evaluative aspect of happiness. However, in reality, it is difficult to separate this from more changeable mood states, and the current mood of the individual is likely to shape the judgement process. Schwarz and Strack (1991) show that situational conditions including mood influence life satisfaction. Others counter that the effect of mood in such studies may be exaggerated. Eid and Diener (2004), for example, show that correlations between occasion-specific satisfaction and mood are very small, and suggest that mood explains less than 2% of the variation in measures of global satisfaction (based on a sample of 280 students measured 3 times at intervals of four weeks). They suggest that mood effects may be less pervasive in surveys compared to experimental research, perhaps because the setting is typically the respondents' home and because they have an awareness of the purpose of the research.

A second consideration is the so-called 'focusing illusion' (Kahneman et al. 2006), which is the tendency to exaggerate the importance of single factors on their well-being, and may be considered to be a source of measurement error. Here, however, the focusing illusion is not considered to be simply a source of error but instead taken to be an integral part of the process by which satisfaction evaluations are made. For, if it is demonstrated that connectedness influences the money satisfaction relationship as hypothesised, then it may be that the focusing illusion effect is weaker, less applicable, or more easily displaced, than for those lacking this source of psychological benefits. The order of questions has similarly been shown to influence evaluations of SWB (Schwarz and Strack 1991). However, in the data used here, where all the responses arise from the same survey, and where the ordering of the SWB questions is the same in each wave, then the effect of question ordering can be assumed to be less problematic than experimental data may suggest. Additionally, as described above, the global satisfaction question follows a battery of domain-specific items making it unlikely that any individual's global evaluation of satisfaction is overly influenced by a single domain.

3.4 Methods for analysing life satisfaction

Throughout the analytical chapters, I take life satisfaction to be linear in nature. This is to assume that the 'distance' between a satisfaction score of 2 and 3, for example, is equivalent to the distance between, say, 5 and 6. This is a strong assumption and some advocate the treatment of satisfaction as ordinal rather than linear for statistical modelling (e.g. Lu 1999). However, the two modelling approaches have been shown to produce the same results in life satisfaction research (Ferrer-i-Carbonell and Frijters 2004; Blanchflower and Oswald 2004) and robustness checks in Chapter Five also confirm that to be the case. The methods used throughout can be considered as extensions to the basic multiple linear regression model.

3.4.1 Multilevel data

Many statistical methods start from the assumption that observations are independently sampled; however, this is often violated in survey data as individuals belong to a higher-level grouping such as the household, the neighbourhood, the region, and so forth (Snijders and Bosker 2012). This is of consequence in social research because the units that belong to the same cluster are subject to the same influences upon the outcome of interest, not all of which are observable (Skrondal and Rabe-Hesketh 2004). Multilevel modelling is a means to address this. However, the aim of utilising a multilevel approach here is more than simply 'controlling away' spatial dependence as a nuisance, but rather to allow a statistically rigorous answer to the research questions that relate to the relationship between the micro-unit and the macro-unit and provides a means to explore the interplay between macro-level independent variables and the micro-level dependent variable.

Where the macro-level unit is the local area, multilevel models provide a measure of the degree to which the area can influence the well-being of the individuals living there. For example, the context-level contribution to subjective well-being can be revealed to be very low at around 1% when area is defined as region (Propper 2005; Ballas and Tranmer 2012), or much more substantial at 11% when the clustering unit is the much smaller 'block' (Dupere and Perkins 2007), and up to 14% on related outcomes such as perceived collective efficacy (Duncan et al. 2003). Various studies have focused on the dissonant context, and shown for example, variation in the detriment to well-being during unemployment depending upon how many others around are 'in the same boat' (Clark 2003) and similarly better mental health outcomes are seen in ethnically consonant areas (Halpern 1993).

Longitudinal data can also be thought of as having a hierarchical structure where observations (level 1) are nested within individuals (level 2) (Steele 2008; Skrondal and Rabe-Hesketh 2004). Therefore, the degree of clustering of observations within individuals, due to, for example, stable trait or stable lifestyle characteristics, is explicitly modelled. Multilevel modelling offers several analytic advantages over alternative methods such as fixed effects models. Firstly, and of primary importance to method selection here, it allows both time-varying and time-invariant explanatory variables which means that the effects of changing financial circumstances may be tested in relation to non-changing connectedness. Fixed effects models would not be a suitable analytic tool, as time-invariant predictors would have no within-person variation on the explanatory variable of interest (Allison 2009). Furthermore, where connectedness is time-invariant this may exert a direct influence on the time-varying outcome, and this is explicitly modelled in Chapter Six.

One of the reasons that multilevel (or 'random effects' models – see below) are not utilised more widely according to Bell and Jones (2015) is due to the assumption of the model that residuals are independent of covariates, an assumption that is often violated. However, as the authors elucidate, this assumption reflects an under-theorised model rather than a source of bias.

3.4.2 Multilevel modelling

The multilevel approach means that within-group and between-group variability can be explored in a single model (Snijders and Bosker 2012). Multilevel differs from 'normal' regression in that it models unobserved heterogeneity due to clustering by estimating an error term for each level specified in the model. This way of accounting for the variability within and between the higher level groups is regarded as 'random variability', hence the term 'random coefficients' and 'random effect' models (Snijders and Bosker 2012). In a *random intercept model*, the mean (i.e. intercept) of the outcome is allowed to vary for each higher-level group thus producing an error term of residuals from the group mean. The level-specific error term parameters are summarised into variances for reporting and interpretation.

The random intercept models are extended in Chapter Five by allowing the slope of an explanatory variable to vary between groups. In these models, so-called *random slopes models*, an additional random parameter is estimated for the variance of the group slopes. The covariance between the random intercepts and the random slopes is of substantive interest, the significant results imply that the clustering of the outcome is dependent upon the value of the explanatory variable. Skrondal and Rabe-Hesketh (2008) summarise that "[w]hereas random intercepts represent unobserved heterogeneity in the overall response, random coefficients [slopes] represent unobserved heterogeneity in the effects of explanatory variables on the response variables" (p. 50). As the value of the covariance between the intercepts and slopes are not invariant to the value of the explanatory variable, I centre the explanatory variables as recommended by Singer and Willett (2003). Random slopes could, in theory, be added for each explanatory variable in the model. However, random slope models quickly become computationally demanding and challenging to interpret. Parsimony is a practical aim of the multilevel models and I restrict random slopes to those that are most useful to interpret the data and answer the research questions.

Multilevel models consist of a 'fixed' part, in which coefficients are like those in any other regression model, and the 'random' part, in which the residual variances for each level are estimated, as well as covariances. The random effects are latent, which is to say not directly

observable, and are estimated using maximum likelihood. The parameters are estimated under the assumption that the level 1 and level 2 residuals are normally distributed with constant variance and that the residuals have a mean of zero (Snijders and Bosker 2012). Examination of the residuals from the models in the empirical chapters shows that this assumption is not violated.

The degree of similarity among the observations within-group and between-group is expressed through the Intraclass Correlation Coefficient (ICC) which functions as an indicator of heterogeneity between groups. The ICC is calculated by dividing the variance of the between-level units by the total variance and is expressed as a ratio with possible values between zero and one, and is interpreted as the variability that can be attributed to each level of analysis. The multilevel models are built up in steps from the simplest case of a random intercepts model, the *empty model*, which is also known as the *variance components* model (e.g. Skrondal and Rabe-Hesketh 2004). In the empty model the ICC shows the proportion of variance being explained at each level before any independent variables are added, thus providing a baseline partition of variability at each level. The subsequent models that include explanatory variables are compared to the empty model both for changes in the ICC, but also in shifts in residual variances. From the residual variances, a proportional reduction of error (PRE) is calculated as an indicator of the level of variances explained by the explanatory variables[7].

3.4.2.1 Growth curve models

Longitudinal data have two important features, namely that responses are clustered within units, and that the observations are chronologically ordered (Skrondal and Rabe-Hesketh 2004). A 'growth curve' is a special case of a multilevel model in which the outcome is considered to be dependent upon time (Steele 2008) and is used in Chapter Five. The 'wave' of the panel is used as the indicator of time and is treated as a covariate in the model. While longitudinal studies are often concerned with patterns of change over time, or on the timing of particular events (Singer and Willet 2003), the question of resilience is more concerned with year on year *fluctuation* than with *change* per se. The difference is a substantive one. We may expect the sample mean of life satisfaction to increase as the individuals in the panel grow older during the seven years of observation; however, the research questions are more directly concerned with fluctuations which are expected in the form of year on year increases or decreases large or small depending upon life's ups and downs. A substantial portion of life

[7] The PRE at level 1 is calculated by dividing the difference in level 1 variances between the nested models by the level 1 variance in the null model.

satisfaction, a little over half as a simple guideline (based on the literature and the year on year correlations, see Chapter 5, Table 5.4), depends on changeable circumstances and events. Accordingly, there are a set of external circumstances in the life of the respondent (of which the focus here is on financial matters and social connectedness) that may or may not be going well in each wave and are likely to influence subjective well-being at that wave.

Nonetheless, 'wave' is an important explanatory variable in the model. Because average earnings increase throughout the years spent in the labour market (Rigg and Sefton 2006; Easterlin 2001) and those earnings are assimilated and cause aspirations to shift upward (Easterlin 2001; 2003), the amount of income necessary for the maintenance of SWB is likely to undergo changes within individuals throughout the 7-year window of observation in this study. The chronological ordering of observations allows adaptation effects to be explicitly tested in Chapter Five.

3.4.3 Multiple group models

Multiple group modelling is an alternative means of dealing with temporal ordering, and is used in Chapter Six in conjunction with linear regression to test for changes in resilience before and after a change in connectedness has taken place. Multiple group models provide a means of testing for differences between groups in two ways. Firstly, the size of the coefficient, with the standard errors to calculate confidence intervals, can be compared across groups. Differences in coefficient estimates are taken as 'weak' evidence in support of the hypothesis that differences exist between the groups. Secondly, further 'strong' evidence is sought by adding constraints to the model to hold equal the coefficients in question; where the unconstrained model is significantly better in terms of the Wald test it can be assumed that the model fits better when the coefficients are allowed to vary in the two groups, and thus it is concluded with additional confidence that a real difference exists between the two time points. The null hypothesis of the Wald test is that the coefficients are simultaneously equal to some value; a p-value of below the cut-off indicates that the addition of constraints has harmed the fit of the model and the alternative hypothesis can be accepted, that is, that the parameters are different in the two groups (Singer and Willet 2003). The standard cut-off of $p < 0.05$ is used, although results of borderline significance are also considered in conjunction with robust non-changing coefficient estimates to provide evidence for change.

3.4.4 Interaction terms

Following the resilience literature, the effect of connectedness is tested using 'protective factor models' (described in Chapter 5) which is realised through the use of interaction terms

in the models of life satisfaction in Chapters Five to Seven. By adding interactions, the ameliorating or amplifying effects of connectedness on the income-happiness relationship can be understood in a way that simple additive regression equations would not show. As such, interactions are a central component to testing the hypotheses. Interaction effects are known to require large sample sizes, particularly in the presence of measurement error on the predictor variables (Aiken and West 1991); however, the large sample sizes from the BHPS are taken to be adequate for testing the hypotheses. The interactions are computed after centring the predictor variables as it means that the simple effects can be interpreted meaningfully as the effects at a meaningful level of the stressor.

3.4.4.1 Cross-level interaction terms

A further advantage of random effects over fixed effects is that multilevel models offer a robust means of examining the interplay between the higher- and lower-level explanatory variables (Bell and Jones 2015). In addition to random slopes, cross-level interactions between the level 1 and level 2 variables are used, these being both statistically viable and of substantive interest (Singer and Willett 2003). For example, in Chapter Seven, the effect of individual connectedness (level 1) is hypothesised to moderate the size of the effect of neighbourhood income (level 2) on SWB. Again, centring is important, with a meaningful interpretation of zero necessary to allow for straightforward interpretation of the main effect coefficients in the model.

3.5 Summary of chapters and methods

This chapter has provided an overview of the data, the outcome and explanatory variables, and the statistical methods that will be used to answer the research questions around resilience to financial stress and connectedness. Below, each of the four empirical chapters is summarised in terms of its aim and corresponding methods used to achieve that aim. The sample used in each chapter is summarised in table 3.7, with each receiving additional explanation it the appropriate empirical chapter.

	N individuals	N observations	Used in:
Whole sample	18,577	126,373	
Time 1 (Waves 13 and 14) excluding proxy respondents	14,192	-	Chapter 4
Time 2 (Waves 17 and 18) excluding proxy respondents	12,912	-	Chapter 4
Those with non-changing connectedness (Waves 12-18)	4,950	34,256	Chapter 5
Waves 12-18 excluding proxy respondents	16,117	-	Chapter 6
Present at T1 and T2	10,991	-	Chapter 6
Wave 17 England and Wales only, non-missing connectedness	8,242	-	Chapter 7

Table 3.7 Summary of samples used in empirical chapters; Number of observations provided only where relevant

Chapter 4: Patterns of connectedness: Developing a measurement schema of strong and weak ties

The aim is to lay out the measurement schema of connectedness which will form the explanatory variable for testing the hypotheses in later chapters. To do this, firstly, the theoretical model is described with attention to the particular types of connectedness that are expected to influence the money-happiness relationship in different ways. This is then operationalised and a latent class model is used to confirm if the expected patterns of connectedness fit the data well. Multiple solutions of the LCA will be explored and the best fitting selected based on the information criteria, entropy, and on the interpretability of the classes. In addition, this chapter will include a MIMIC model to explore the socio-demographic and psychological profiles of each class. This serves not only a descriptive purpose but also highlights the role of the control variables. Finally, the stability of connectedness will be assessed by comparing latent class assignments at two time points.

Chapter 5: For whom money matters less: non-changing connectedness as a resilience resource

This section of analysis seeks to establish a baseline understanding of the degree to which connectedness influences the money-happiness relationship which is achieved through a series of growth curve models. Initially the money-happiness relationship is explored by using each of the three income indicators to predict life satisfaction including a test of whether lagged income effects are important for life satisfaction. Connectedness, as operationalised in

Chapter Four, is also added to the model, and interacted with income to determine differential outcomes. Throughout the chapter, the residual variances and ICCs are reported to capture the degree to which life satisfaction depends upon the individual or the occasion and how these shift with the addition of the explanatory variables. A full set of controls are added to rule out known confounders as a cause of the observed relationship.

Chapter 6: Something about the network or something about the person? Changing connectedness and its effect on resilience

This chapter seeks to establish the patterns of change in connectedness by fitting a latent transition model including two measurement occasions, and explores socio-demographic correlates of transition which are then used as controls in the later models. The main analytical section uses multiple group linear regression to explore if the money-happiness relationship changes after a transition in connectedness has occurred. In doing so, unobserved characteristics of individuals are ruled out as a driver of the relationship between connectedness and resilience.

Chapter 7: Who cares what the neighbours earn? An examination of the effects of social comparison on the well-connected and the isolated

This final empirical chapter seeks to determine whether connectedness is related to the degree to which social comparison influences life satisfaction. It does so by regressing area income on individual satisfaction in the multilevel framework. The level 2 unit of analysis is the MSOA which is considered to be a unit well-suited for analysis; any larger and average incomes may have no effect on the individual as it is too distant to be of consequence to the individual. Again a full set of control variables is used to add robustness to the findings, including specific controls relating to the area such as deprivation.

Chapter 4. Patterns of connectedness: Developing a measurement schema of strong and weak ties

The fundamental aim of this chapter is to produce a measurement schema of connectedness to use as the instrument for testing the hypotheses in subsequent chapters. Latent Class Analysis (hereafter LCA) is the methodological means to achieve this aim. The choice of LCA as an analytic tool reflects the position that connectedness is more usefully considered category-like than dimension-like in its underlying nature. This reflects the 'abrupt differences' that are theorised to occur along seemingly linear scales (explained in section 4.3.1) and that 'states' of connectedness such as social integration depend on more than one factor. This is not to say that levels or numbers of social ties are dismissed as unimportant; a feature of LCA modelling is that levels of the indicators can be used to distinguish classes.

This chapter also has a number of secondary aims. The first is to explore the socio-demographic and psychological profiles of the individuals that constitute any given type of connectedness which serves to establish the role of confounders. Secondly, this chapter seeks to address the stability of connectedness through time as this has additional consequences for the analytical strategy in later chapters specifically for de-coupling the effects of connectedness from the effect of stable traits of the individual. I begin with an overview of a small but informative literature where connectedness has been treated as a categorical variable; this serves as validation of the approach, exemplifies analytical advantages, and guides the labelling of the latent classes.

4.1 Previous typological research

This section reviews six examples of research, which, though the methods and outcomes are varied, all treat connectedness, networks, or social capital as 'types' rather than a scale. There are several motivations and justifications for taking such an approach. It is widely acknowledged that social capital is a multi-dimensional construct (Li et al. 2008; Owen and Videras 2009) so it cannot be captured on a uni-dimensional scale. In a more network-based approach too, it is pointed out that a network has an array of attributes and cannot be simplified to a matter of 'more or less' (Fiori et al. 2006). A typology is able to capture several concepts including network heterogeneity, involvement with community and life experiences, thus extending beyond the notion of a scale (Cattell 2001).

Cattell's (2001) typology is based on qualitative data from around 70 interviews which took place in deprived residential areas of East London and is a study of the mediating role of networks on health outcomes. The features of the social networks of the study participants are used to distinguish five network types:

1) the *socially excluded or truncated network* is restricted in size and tends to include newcomers, the unemployed and the elderly
2) the *homogeneous network* is made up predominantly of family but with a small number of friends and neighbours
3) the tight knit *traditional network* is made up of people who have spent most of their lives in the area and is made up of friends, family, and ex-colleagues and so forth
4) the *heterogeneous network* tends to be loose knit and includes those who are active in voluntary organisations
5) the *network of solidarity* is identified which contains a mix of the local tight knit social group with participation in formal and informal organisations.

The study finds that the members of different network types express well-being and coping mechanisms differently. Those with a traditional network, for example, emphasised "getting on with it" rather than seeking help from external sources, while those with heterogeneous networks have access to a range of resources and "cope actively" (p. 1510). The type of network an individual has is explained as resulting from the life course of geographical, social and economic factors as well as individual agency. A further analytical advantage exemplified here is that the typology allows the explicit exploration of the effects of social isolation, despite it being a small category. Social isolation was shown to be associated with expressions of powerlessness, pessimism, and low self-esteem in the face of adversity.

Other studies have focused more on the structural elements which go to make up types of connectedness. For example, Wellman's study (Wellman 1982; Wellman et al. 1988) of the personal networks of residents of East York near Toronto, which began in the late 1970s, identifies types on the basis of both relational and socio-demographic factors. One such example constitutes married men, in employment, who name mostly family members for support; another comprises housewives and single mothers who include neighbours in their support network. This mix of indicators confirms the tendency for clustering to occur across social space.

Again, with a focus on structural elements as a basis for typologising networks, Bellotti (2008) identified four types: small *cliques* of friends, the large *company*, *core-periphery* structures where a tight knit group at the centre have less dense ties with others on the edge of the network, and finally *the contextualised network* where subgroups specialise in the provision

and purpose of social interaction. The implications of network type for SWB are sometimes made explicit, for example, with members of cliques sometimes feeling desperate for alternative opportunities for socialising.

While Bellotti's study concentrated on the connectedness of young adults, others have examined the social connections of the elderly. Fiori et al. (2006), for example, find five network types including:

1) the *non-family restricted* network in which there are few connections to either friends or family
2) the *non-friends* network who have above average connections to family, but below average for friends
3) the *family-based network* with a high frequency of socialising with their adult children
4) the *diverse network* whose members have above average scores on all dimensions, and finally
5) the *friends-based network* where interaction with friends is much higher than average.

Both the diverse and friend-based network types are associated with fewer depressive symptoms; the typological approach highlights both the possibility of multiple pathways to SWB, but also that combinations of network features are important to explain outcomes.

In a more quantitative and social capital-oriented approach, Owen and Videras (2007) use different types of organisation membership as well as perceptions of fairness and social trust and they find eight latent classes based on patterns of these indicators. An interesting aspect of this model is the conceptual overlap between classes. The members of their classes 4 and 5, for example, are both trusting and perceive fairness in institutions but members of class 4 tend to join religious groups while members of class 5 are more interested in unions. Despite their similarity, these two classes differ in terms of their socio-demographic profiles, where it must be assumed that the type of organisation is the key point of distinction. This example highlights that LCA, despite clustering features together, is also able to highlight the effect of a single indicator.

Also using the type of organisation as the variable of interest, but finding classes which are more conceptually distinct, Li et al. (2008) uncover three classes: the 'inactive' who are in the majority of the population and have memberships of trade unions and sports clubs if at all; the 'religious' are active with religious and 'other' organisations and make up around 18%; and about 6% are 'civic-engaged' who are 'enthusiastic joiners'. The determinants of class membership are explored here and the classes are shown to occupy "distinctive social spaces"

(p. 403). For example, the religious and the civic-engaged tend to be older, and the civic-engaged are more likely to belong to the professional classes.

These examples demonstrate a strong theoretical and empirical motivation for treating connectedness as a latent categorical construct. This approach brings the potential advantage of data reduction and it is a means of showing the effectiveness of a *combination* of indicators as well as isolating the effect of a single indicator. In addition, the explicit modelling of 'extreme' types such as the isolated and the diverse/heterogeneous means that the full range of possible outcomes can be observed. The differences between the typologies from these examples shows that the outcome is heavily dependent upon the indicators which in turn are selected to represent varying conceptualisations of connectedness and associated research questions. In this respect, the measurement model used here does not represent a single universal concept, but just one possible way of many of thinking about the qualities of connectedness. The concept here, in accordance with the hypotheses, is based on having strong and weak ties thus is perhaps most similar to Cattell's typology, though differing by being a quantitative study with a large sample, and in its relative simplicity in terms of the number of indicators.

4.2 Four spaces of connectedness

Figure 4.1a represents the hypothetical foundation for the LCA models and is used as a guiding framework. It shows the theoretical existence of four 'spaces' in which a type of connectedness may be placed, corresponding to the combination of being 'high' or 'low' on the dimensions of strong ties and weak ties that were described in Chapter Two. A single class of a latent categorical variable may be interpreted (and labelled) considering the position relative to both dimensions. For example, in the upper right-hand quadrant would be well-connected individuals with both strong and weak ties. The bottom left corner, on the other hand, would contain those with low levels of both tie types. This framework also allows for consideration of the 'off-diagonal'. The top left quadrant, for example, would include those who score low on informal ties but who have organisational ties, a state which may be relatively unusual considering that informal and formal ties tend to correlate (Letki 2008). In modelling these spaces, explicit attention is brought to the hypothesised effects of combinations of tie types.

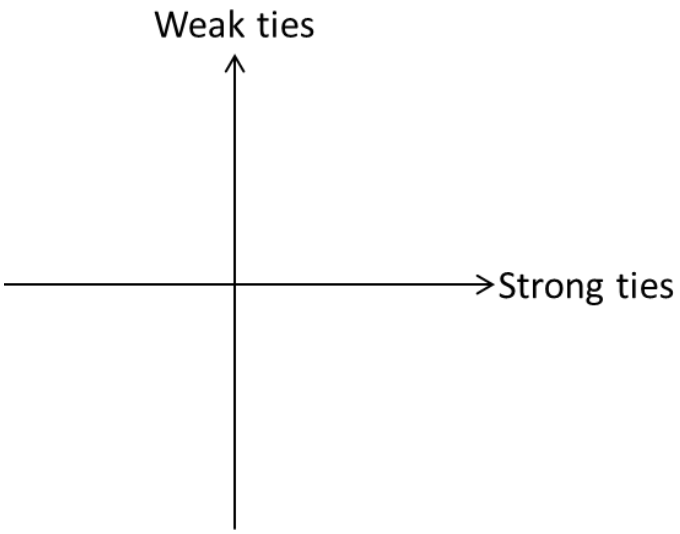


Figure 4.1a The four hypothetical spaces of connectedness based on strong and weak tie dimensions

4.3 Data and model specification

Not all relevant questions were asked to respondents in all waves of the survey, thus variables from the 13th and 14th waves (2003-4) are combined into a single data set and treated as a single time point in the analysis (Time 1) as are the same indicators from the 17th and 18th waves (Time 2). The description of the model specification is applicable to both times, while the detailed model results relate to Time 1. The results from Time 2 are considered in section 4.6 with attention to assessing the stability of connectedness through time.

The indicators of connectedness were described in Chapter Three: activity with organisations (weak ties), friends (strong ties) and social support (strong ties). This section outlines how the variables map onto the two conceptual dimensions of social connectedness, and their application in the latent variable model.

4.3.1 The strong ties dimension

In structural terms, perhaps the most basic consideration is that of the size of the personal network of strong ties. Fischer (1982), for example, reports a linear relationship between the numbers of alters reported and well-being. The design of the questionnaire used by Fischer allowed participants to mention an uncapped number of social connections, and the maximum given was over 60. This 'more is better' hypothesis is also supported by Burt (1987) who shows that those with more people to discuss important matters with are happier than those with less. Using a smaller sample size of qualitative interviews, Wellman's study of a Toronto suburb suggests a 'typical ideal' network size of 11 people (Wellman et al. 1988). Following these

studies, the strong ties dimension aims to capture the size of the informal network. However, the available measure in the BHPS stops at a maximum of three friends. This is clearly a rather limited expression of one's social circle, and cannot be understood as true measure of the network size of respondents. However, other research into personal networks has drawn conclusions from such partial snapshots, such as the widely-cited General Social Surveys (GSS) of the USA from 1985 and 2004. The GSS provided space for information on 5 social ties and from this wide ranging conclusions about the social lives of Americans have been drawn (e.g. McPherson et al. 2006). While a zero to three scale cannot tell us much about the very social, it provides a critical distinction between those naming three, and those not. This is what De Boeck et al. (2005) call an 'abrupt difference' which represents a discontinuity despite the linearity implied by the measurement scale. Here an 'abrupt difference' is theorised to occur at the maximum value given the curtailed nature of the response options, and this variable is therefore treated as an indicator of whether or not the informal network is restricted in size and is taken as an adequate proxy for network size. At Time 1, which is the basis for the initial model in this chapter, 17% of the sample has restricted networks.

Close friends are sometimes assumed to coincide with emotional support and Wellman and Wortley (1990), for example, find that respondents get their support from a small number of strong ties. However, others have shown that friends may specialise in their role as companions for doing activities together, a function quite separate from emotional support (Fischer 1982; Bellotti 2008). For that reason, as well as the number of friends, social support is considered here as an indicator of the quality of the relationships, that is, the extent to which the ties provide emotional support. It is possible to have friends but still feel lonely and conversely to be perfectly happy with limited social contact (Cacioppo and Patrick 2008) and evidence supports the idea of types of isolation. For example, Weiss (1974) researched a Boston organisation in the 1970s offering support to 'parents without partners'. Many members of this group remained *emotionally isolated* even though they received comfort from the other group members. The wives of married couples who had moved to a new location, on the other hand, were described as *socially isolated*; despite the emotional support of their partners, the social isolation led to boredom and a sense of marginality.

The social support measure also 'completes' the picture of strong ties in the sense that support may well be offered from within the household while the friend indicator looks outside the household. Further, by its inclusion in the model social support is isolated as a possible mechanism of effect. The distribution of non-missing responses to the five social support items

is shown in Table 4.1. Just 3 or 4% answered "no-one" to each item, and around 70% could say there was more than one person for this aspect of support. As described in Chapter Three, these five items are averaged, after imputation, into a single score running from zero to 2.

Is there someone…	No-one	Yes, one	Yes, more than one	N
who will listen?	3.6%	27.1%	69.3%	13,075
to help in a crisis?	3.3%	25.2%	71.5%	13,082
you can relax with?	3.8%	26.2%	70.1%	13,065
who really appreciates you?	3.2%	19.8%	77.1%	13,059
you can count on?	3.9%	27.2%	68.9%	13,063

Table 4.1 Distributions of non-missing responses to the 5 social support questions before imputation; data from 2003.

While the "quality and quantity" of strong ties can fit conceptually onto a single dimension[8], a possible weakness of combining indicators is a risk to the clarity of the resulting classes, and potentially their explanatory power. To minimise the risk, firstly, the relationship between friends and social support is examined. Table 4.2, shows the mean level of social support by number of friends; there is no statistical difference in the level of support for those with zero or 1 friend, but the levels increase for 2 friends, and are higher still for 3 friends, suggesting a monotonic relationship. On the other hand, Table 4.3 shows the mean and standard deviation of social support by having 3 friends or less, where greater variation in the level of social support among those with restricted networks is evident. This indicates that the distinction may be of more importance to the relatively isolated. The model is set up to test this and the final solution supports the idea that social support is a 'third dimension' in the isolated space (see results section).

no. Friends	Social support	std err
0	1.45	0.03
1	1.40	0.02
2	1.57	0.02
3	1.71	< 0.01

Table 4.2 Average perceived social support by number of friends; after imputation, N = 13,141

[8] For example, Paxton (1999) uses quality and quantity to explain the singular dimension of social capital.

	Social Support	
	< 3 friends	3 friends
Mean	1.49	1.71
Std dev	0.52	0.39

Table 4.3 Mean and standard deviation of social support by number of friends, N = 13,141

4.3.2 The weak ties dimension

The weak ties dimension is made up of a single indicator variable which itself is derived of two survey questions on activity with organisations and time spent with voluntary organisations and local community groups. In the context of social capital but requiring consideration here, Hall (1999) points out that in using voluntary associations as an indicator, assumptions need to be made that relate to the theorised mechanism of effect. For Hall, firstly, it is assumed that voluntary associations involve face-to-face interactions with others, and secondly, that the purpose of engagement is considered. The first of these assumptions is equally relevant here as the mechanisms relating to the psychological benefits are dependent upon actual social interactions rather than passive memberships. To ensure that this assumption is valid, the measurement selected is of *activity* with voluntary groups rather than *membership*. The wording in the questionnaire is as follows: "whether you are a member or not, do you join in the activities of any of these organisations on a regular basis?" Additionally, the respondents are asked about the frequency of attending various activities including volunteering and community groups. This overlaps conceptually with the organisations in the survey question described above and the two variables are combined into a single indicator by recoding the number of organisations from 0 to 1 where group attendance was weekly or monthly but had not claimed to 'be active'. The higher counts are collapsed into a single category due to small frequencies, resulting in the scale running from zero to 3 as shown in Table 3.5.

The second assumption relates to the nature of the group or organisation with 'self-help' type groups having less value than types of 'common endeavour' in the social capital framework (Hall 1999). Other work highlights the value of 'bridging' or 'cross-cutting' ties as having greater potential to generate trust (Paxton 2007). However, trust is not central to the research questions being addressed, neither is the crossing of boundaries of social identity. Rather, the theorised mechanism relates to having a range of secondary ties and all organisations are taken to have equal potential in this regard. The number of organisations is used as an indicator in this analysis based on the assumption that connection to any organisation will

bring, as Granovetter described, a view of "…the world beyond his own friendship circle" (1973, p. 1371).

In the same way as described for the 'friends' variable, an abrupt difference is assumed to occur between zero and one on the organisation scale, where the effect of involvement with one organisation compared to none is expected to have a larger effect in terms of the addition of secondary ties to the network, than, for example, the difference between two and three. However, while any organisation activity above zero is linked to social integration, we might also expect, given the theorised mechanisms, that additional activity will bring about additional resilience. The existence of a very active class, such as Li et al.'s (2008) "enthusiastic joiners", is hypothesised in addition to a class of those undertaking more modest levels of voluntary activity.

4.3.3 The LCA Model

As described above, I hypothesise a latent construct of social connectedness that has a minimum of four classes, once in each weak-strong combination as shown in Figure 4.1a. In addition, as outlined in section 4.3.1, I hypothesise the existence of two distinct types of isolation based upon the level of social support. Further, the model is also set up to test if a class of enthusiastic joiners can be discerned. The LCA is a means of developing a measurement instrument that will allow the hypotheses to be tested, and the distinction between different types of joiners and different types of isolation is expected to provide explanatory power for the overarching research aims. The hypothesised six classes are shown in Figure 4.1b.

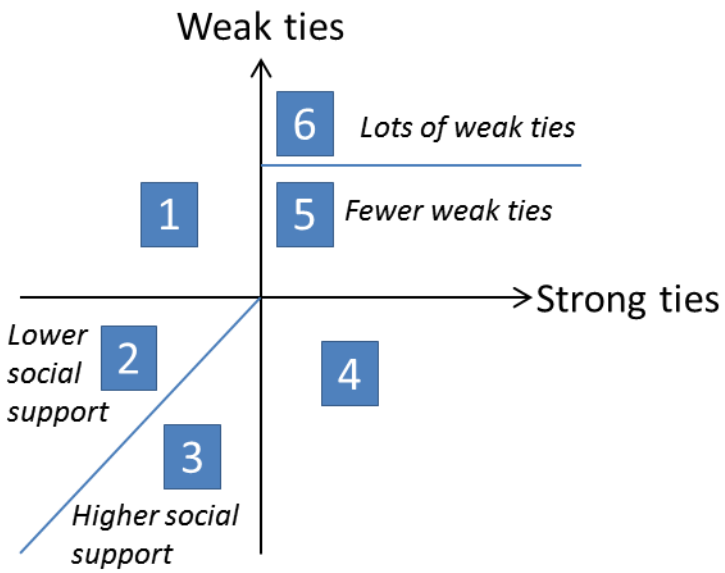


Figure 4.2b The six hypothesised classes

However, it is also important to produce a model that fits the data well and three versions of the model (with four classes, five classes, and six classes) were fitted for comparison and the best solution in terms of fit statistics is selected as the final model. The model seeks a statistical solution that minimizes the interrelationships among the variables, given the classes. The assignment of individuals to classes is determined through the clusters that best represent the relationships between the indicator variables.

A confirmatory latent class 'mixture model' was performed in Mplus (Muthén and Muthén 2007) using the three dependent variables described above (number of friends, mean social support, number of organisations). In addition, binary versions of the above three variables were coded for the express purpose of managing the model constraints. The binary cut-offs were chosen to coincide with the point of abrupt difference based on the theoretical model, the dichotomous variables being maximum friends (1 = 3 friends, 0 = less than 3) and any organisation (0 = none, 1 = 1 or more). The constraints were constructed in such a way that no observed combinations of manifest variables were disallowed (McCutcheon 1987). The steps are outlined below and a summary of the model fit statistics of each are presented in Table 4.4.

1. Model 1 specified four classes, one for each of the four hypothetical spaces in the conceptual model. The isolated class was specified by fixing the maximum friends indicator to 0, and organisations to 0, while its opposite was specified as having maximum friends and organisations set at 1. The two remaining classes were

constrained to have maximum friends but no organisations, and vice versa. These constraints are shown in the hypothesised space of connectedness in Figure 4.2.

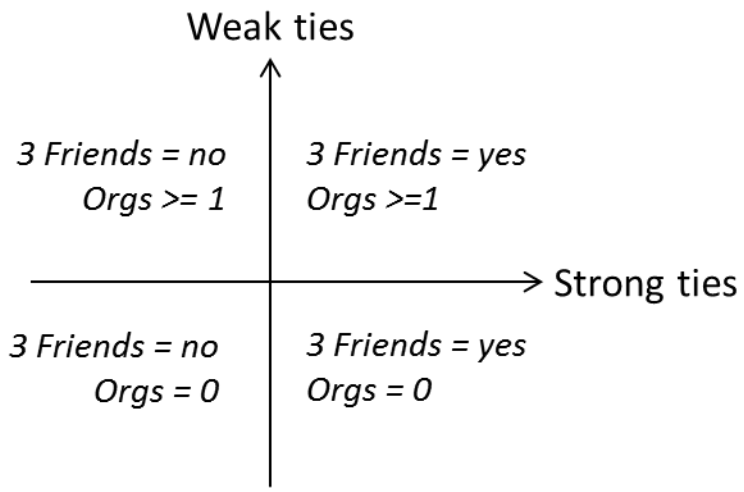


Figure 4.3 Constraints applied in Model 1

2. Model 2 specified 5 classes, with two classes constrained to occur in the isolated space with an additional rather loose constraint specifying that one of the two should be higher in social support than the other. This model is better fitting than Model 1, confirming that social support is a distinguishing factor between types of isolation.
3. Model 3 builds on model two, with the sixth class specified to occur in the integrated space, distinguished by the level of organisational activity.

Of the three models, the final model with six classes has the best (lowest) information criteria and was chosen as the final solution[9]. Entropy scores are very strong for all solutions which is an indication of a high degree of distinguishability between classes (Collins and Lanza 2010). The six-class solution was re-run in Mplus with 2000 random start values which ensured that the best log likelihood value was replicated multiple times. The parameter estimates are therefore reliable and replicable.

	BIC	AIC	Entropy
4-class	91373.98	91207.64	0.974
5-class	86101.67	85905.09	0.979
6-class	75847.07	75612.69	0.973

Table 4.4 Fit statistics for 3 versions of confirmatory LCA model of data at Time 1 (2003-4)

[9] As described in Chapter 3, both the AIC and BIC point to the same solution

Although the information criteria provide useful guidance the confirmatory approach taken here leaves the model fit as a secondary aim. Improved model fit would be obtained by increasing the number of classes and leaving the classes to be statistically determined. However, the six-class solution meets the needs determined by the hypotheses, and keeps the number of categories to a manageable number.

Average latent class probabilities for likelihood of membership (row) by latent class (column)						
	1	2	3	4	5	6
1	0.997	0.003	0	0	0	0
2	0	0.994	0.006	0	0	0
3	0	0	1	0	0	0
4	0	0	0	0.947	0.032	0.021
5	0	0	0	0	1	0
6	0	0	0	0	0	1

Table 4.5 Average latent class probabilities by likelihood of membership.

The high entropy score is reflected in Table 4.5 which shows the probabilities of class membership for each of the six latent classes. For those assigned to class 1, they are assigned with a probability of 0.997, or otherwise stated, a 99.7% chance that they belong in this class and 0.3% chance they should be in class 2, but zero for the others. This shows a small degree of overlap between the classes 1 and 2. Similarly, there is a small overlap between classes 2 and 3, whereby there is a 0.6% chance that members of class two belong to class three. Classes 3, 5 and 6 have no degree of uncertainty at all. The most uncertain of the classes is class 4, whose members have an average likelihood of 0.947. Of those assigned to class 4, there is a 3% chance they could belong to class 5 and a 2% chance they should be in class 6. This reflects the small number of cases with missing data on organisational activity, where class assignment is based on strong tie indicators only.

4.4 Results (Time 1)

A summary of the solution is shown in Table 4.6, which includes both the counts and probabilities of class membership and the means of the indicators. The variances are assumed to be constant across classes and are not shown. Class 1 contains 6.3% of the sample and is made up of individuals who have restricted networks, each naming on average just 1.18 friends outside the household. People within this group are, on average, active with 1.32

organisations, and the mean level of social support is 1.56. Class 2 represents the most isolated of the typology and are the second smallest group at 5.3% of the sample. As well as lacking in emotional support (average 1.27) they are socially isolated naming on average 0.43 friends, and no organisations. In class 3 (5.0%), despite having a restricted friend network (1.88 on average) and no organisational activity, the level of social support is moderate at 1.59. On the other side of the theorised vertical axis are the three classes made up of people who all named three friends, that is, have networks assumed to be unrestricted in size. Class 4 has the largest population with 43% falling into this group; its members have high social support (1.68), but do not take part in organised social groups. Classes 5 and 6 both have high levels of perceived support as well as an unrestricted network of friends; they are distinguished only by the number of organisations in which they take part. People in class 5 (24.6% of the sample) participate in just one organisation, whereas class 6 (15.8%) contains people who are very involved, being active with an average of 2.28 organisations.

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Total
Class label	*Instru-mental*	*Emotional isolation*	*Social isolation*	*Tradition-al*	*Integrat-ed*	*Civic-minded*	
Friends	1.18	0.43	1.88	3	3	2.98	
Org	1.32	0	0	0	1	2.28	
Support	1.56	1.27	1.59	1.68	1.73	1.76	
n	892	754	715	6,102	3,492	2,241	**14,196**
%	6.3%	5.3%	5.0%	43.0%	24.6%	15.8%	**100.0%**

Table 4.6 Results of LCA model at Time 1 including indicator means and class sizes

For ease of description as well as to make the model results more tangible, labels are assigned to classes. They are intended as convenient shorthand for the qualities of the class rather than a definitive statement about each individual it contains. Class 1, which though expected to be an unusual state of connectedness, is a little more frequent than isolation. I label this class "instrumental". Although the motivation for joining organisations cannot be known from the survey response, an instrumental purpose for joining organisations is assumed given that members of this group have a restricted network of friends. Findings from previous research lend some weight to this assumption, for example, as a possible explanation for the surprising relationship between social skills and participation in activities among college students, Riggio et al. (1993) suggest that the reason for participating in organisations was in the *hope* of establishing supportive relationships. Warde and Tampubolon find more diverse friendship patterns among those doing voluntary work, resulting from, they suggest "the classic agony

aunt recommendation that if you are lonely or sad, and haven't got many friends, then join a club" (2002, p. 169). With this empirical work in mind, the label is assigned to reflect the possibility that the organisational activity is a means to fulfil a social need.

The two types of isolation are empirically as well as theoretically distinct; class 2 are "emotionally isolated", while class 3 are "socially isolated". However, in contrast to the types of isolation observed by Weiss (1974), class 2 are socially isolated in addition to being emotionally isolated which is to say that they report few friends as well as a low level of support. The socially isolated have a level of social support much closer to the non-isolated classes, and it is assumed therefore that their connectedness comes from within rather than from outside the household. The emotionally isolated stand a long way from the other classes in terms of their perceived support.

For class 4, the term "traditional" is assigned reflecting the label used by Cattell (2001) for networks based on informal ties. Berkman et al. (2000) define "integration" as involvement with ties ranging from the intimate to the extended (p. 845), combining two elements of the inward and the outward looking, the need for close personal relationships but also some connection to wider society or attachment to community, and Class 5 therefore takes this label. I borrow Li et al.'s (2008) "civic-minded" to describe the members of class 6 with their tendency to be very active in organisations, although Putnam's term 'machers' would also be a good fit. The civic-minded are in fact similar to, or rather a special case of, the "integrated" distinguished only by their high level of organisation-based connectedness. In this, these two classes are similar to the overlapping social capital types found by Owen and Videras (2007) and offer a way to test the effect of organisation activity among those with the same level of informal connectedness. The position of the 6 classes is shown within the framework in Figure 4.3 where social support forms the X-axis, organisations are the Y-axis. Bubbles are coloured by personal network size and sized by the proportion in each class. The fact that social isolation appears 'inside' the much larger traditional bubble reflects that the major difference between these two classes is on the size of the informal network (i.e. the colour).

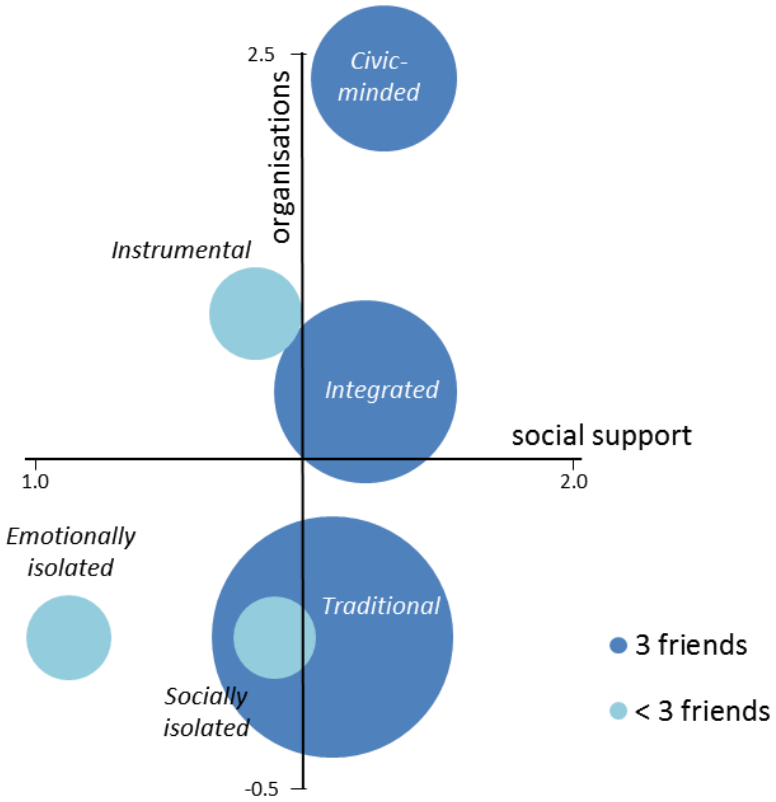


Figure 4.4 The latent classes in relation to the indicator axes of organisations and social support, bubbles are sized by the proportion of the sample in each class, and shaded light if informal network is restricted to less than three friends

4.4.1 The social space

Socio-economic structures shape people's social lives; the well-educated and the well-off are more likely to join groups and be civic-minded (Putnam 2000, Li et al. 2008). Being older is also associated with civic-mindedness (Li et al. 2008). Social support has less variation along class divides, but has been found to be higher among women, who seem to both provide and receive more support (House et al. 1998). Support can be expected to be higher among the partnered than the single, as spouses/ partners are a major source of emotional support (Weiss 1974; Argyle 2001). In this descriptive analysis, personality factors will also be considered as a cause of patterns of connectedness.

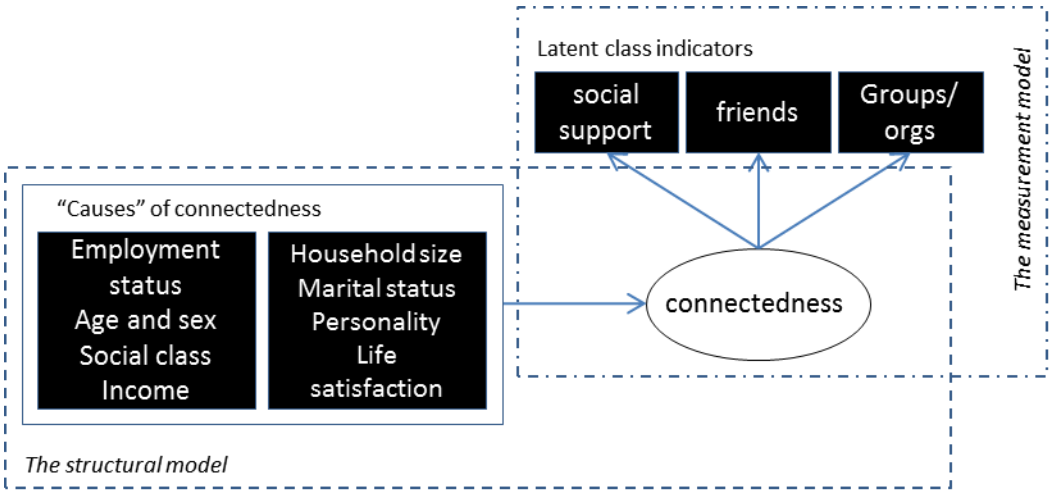


Figure 4.5 MIMIC model: latent variable drives the patterns in responses to variables indicating aspects of connectedness. The 'causes' determine which class a person is likely to belong in.

The method used to explore the social space of connectedness is a multiple indicators, multiple causes (MIMIC) model, which is an integrated model in which the latent class variable (from Time 1) and the exogenous covariates are estimated simultaneously[10]. Like a multinomial regression, the covariates in a MIMIC model predict membership of each class omitting one class as the reference category. Class 4 is chosen as the reference category because it is the most populated and as a class with a middle level of connectedness it allows us to compare with both the better- and lesser-connected. This modelling method takes into account the probabilistic nature of the assignment of individuals to latent classes, and in doing so potentially improves the classification quality and the model fit. As in other regression modelling, the distinction between causes and indicators of a latent variable in a MIMIC model is theoretically rather than statistically driven, and is exemplified in Figure 4.4. Causality is implied in the name and the structuring of the model, but like other regression methods it does not rule out reverse causation, nor does it exclude the possibility of an unmeasured third cause influencing, for example, both income and connectedness. Using personality as a covariate is an attempt to address these downfalls to some degree, by its stable nature it can be assumed to be causally prior to connectedness. However, other factors such as personal values and socialisation experiences are unknown 'omitted variables'. Longitudinal research design mitigates the risk of missing such 'third variables', and is specifically addressed in Chapter Six.

[10] The term 'MIMIC model' is more usually used where the latent variables are continuous factors, rather than categorical classes. Its use here is equivalent.

The variables included in MIMIC Model 1 are the socioeconomic or structural factors which may be expected to influence social connectedness as well as confounding resilience as described in section 2.3.6. LCA MIMIC models include a large number of parameters to be estimated and are computationally demanding. I therefore make some necessary compromises in the number of covariates in any model including combining categories to ensure model convergence and reliable estimations. Employment status takes employed as the reference category and is compared to being in full-time education, unemployed, and long-term ill. Long-term illness as employment status is the only socio-demographic variable and control used throughout the thesis for health status. This decision is based on concern that subjective health measures may be highly correlated with subjective well-being and as such will compete for variance. In Li's (2007) study of SWB outcomes with BHPS data, for example, social capital variables lose their significant effect on life satisfaction once health is added to the model. Looking after home or family is combined into a single category with retired[11].

Household size is controlled with a single dummy variable for living alone. Occupational class relates to the 'most recent job' which is either current or the last provided in a preceding wave of the survey and is coded as follows: 1) professional and managerial (the reference category), 2) intermediate and own account workers, and 3) routine and semi-routine occupations. Marital status is coded as divorced/ separated, widowed, and never married with married/ cohabiting as the reference category. As well as age in years, a quadratic term is included to allow for a curvilinear effect on connectedness. Income is equivalised by household composition and logged as described in Chapter Three. Descriptive statistics of the controls are shown in Table 4.7.

Categorical variables	%		%	Scale variables	Mean	Std. dev
Employed	58.5	Professional	16.3	Life satisfaction	5.3	1.2
Full-time study	7.2	Intermediate	51.7	Logged income	7.5	0.8
Unemployed	3.0	Semi-/routine	22.1	Age	43.1	19.1
Retired	20.6	Never worked	9.9	Agreeableness	16.3	3.0
Care of family/ home	6.7	Married/ cohabiting	51.2	Conscientiousness	15.7	3.3
Long-term ill	4.0	Divorced/ separated	9.9	Extraversion	13.5	3.5
Female	54.5	Never married	7.0	Neuroticism	11.0	4.0
Live alone	15.5	Widowed	31.9	Openness	13.3	3.7

Table 4.7 Descriptive statistics of categorical and scale control variables

[11] This specifically addresses a problem of model non-identification resulting from a lack of variability within the emotionally isolated class.

The results of MIMIC Model 1 are in Table 4.8. Age has a positive relationship with membership of the emotionally isolated, integrated and civic-minded classes more likely than the traditional class. The effect is strongest on the civic-minded for whom a quadratic effect is also evident, which is to say that the likelihood of being in this very active group begins to decline later in life. There are significant differences in employment status; unemployment makes social isolation more likely while the opposite is true for the integrated. Being retired or looking after the home increases the probability of being integrated and civic-minded, an effect independent of age and perhaps reflecting available time as a necessary resource for getting involved with organisations. Having a long-term illness significantly increases the likelihood of being emotionally isolated or in the instrumental class.

Turning now to marital status, being divorced or separated reduces the likelihood of being in either of the two most-connected classes compared to the traditional class, whilst widowhood increases the probability of being in both of the most isolated classes. Those who have never married are significantly less likely to be emotionally isolated or integrated/ civic-minded. It is interesting that living alone makes social isolation less likely. On the other hand, living alone makes membership of the integrated and civic-minded classes more likely, perhaps suggesting that activity with groups may be an attractive way of staying connected when living alone.

Social class also exerts an influence on connectedness, with routine/semi-routine occupations making both types of isolation more likely and integration/ civic-mindedness less likely as would be predicted by the literature (e.g. Li et al. 2008). More generally, being in the labour market protects against isolation. Women are less likely to be instrumental, emotionally isolated, or integrated than the traditional, while there is no significant gender difference for the socially isolated or civic-minded.

Income, finally, does not make social isolation or being instrumental any less likely than traditional; however, as income rises the probability of being integrated or civic-minded also rises, while the probability of becoming emotionally isolated falls. This presents a pattern that requires careful consideration in the analyses that follow; if the civic-minded display greater resilience, a thorough set of controls and checks are needed to ensure that findings are not a spurious reflection of the better living standards experienced by this group, and in the reverse, that the low resilience of the emotionally isolated may simply reflect their greater need. This is explored in detail in Chapter Five.

MIMIC model 1: socio-economic forces					
	Instru-mental	*Emotion-ally isolated*	*Socially isolated*	*Integrat-ed*	*Civic-minded*
Age	0.016	**0.030**	-0.011	**0.019**	**0.087**
Age Squared/ 10	0.000	0.000	0.000	0.000	**-0.001**
Full time study (ref cat = employed)	-0.021	-0.176	0.101	0.025	-0.004
Unemployment (")	0.328	**0.550**	**0.898**	**-0.411**	-0.298
Retired/ Caring for home (")	0.300	-0.110	0.394	**0.211**	**0.573**
Long term ill (")	**0.632**	**0.641**	0.436	0.098	0.058
Divorced/ sep (ref cat = married/ cohabiting)	-0.171	*0.266*	0.228	**-0.221**	**-0.336**
Widowed (")	0.034	**0.426**	**0.528**	0.003	-0.135
Never married (")	-0.160	0.218	**-0.384**	**-0.171**	**-0.352**
Live alone	0.143	-0.127	**-0.361**	**0.301**	**0.624**
Intermediate (ref cat = prof/managerial)	-0.164	-0.078	0.082	*-0.119*	**-0.317**
Routine (")	-0.066	**0.275**	**0.439**	**-0.313**	**-1.030**
Never worked (")	0.058	**0.984**	**0.475**	-0.082	*-0.453*
Female	**-0.372**	**-0.522**	0.020	**-0.124**	0.007
Log household income	0.023	**-0.152**	-0.088	**0.142**	**0.325**
Constant	**-2.972**	**-2.474**	**-1.879**	**-1.866**	**-5.366**
AIC	67911.81				
N	12,958				

Table 4.8 MIMIC model with socio-economic predictors of latent class membership. Coefficients are log odds. Coefficients significant at p < 0.05 are in bold; borderline coefficients (p < 0.1) are in italics. The reference class is class 4 ("Traditional")

MIMIC Model 2 (Table 4.9) explores the effects of personality. The personality indicators used are the "big 5", a well-established set of dimensions on which there is general agreement on their comprehensive coverage and usefulness as organising criteria to cover the array of possible personalities (Taylor et al. 2010). They comprise agreeableness, conscientiousness, extraversion, neuroticism, and openness. The battery of questions to assess these includes 3 questions per trait which can be scored 1 (does not apply to me) to 7 (applies perfectly to me)[12]. The negatively worded questions are reverse-scored and a 3-21 scale constructed for each of the five.

[12] Agreeableness items are labelled with an "A", Conscientiousness "C", Extraversion "E", Neuroticism "N", and Openness "O". Question: "I see myself as someone who . . .
1. Is sometimes rude to others (A - reverse-scored) 2. Does a thorough job (C) 3. Is talkative (E) 4. Worries a lot (N) 5. Is original, comes up with new ideas (O) 6. Has a forgiving nature (A) 7. Tends to be

A useful and concise definition of the big 5 is provided by John et al. (2008):

> "Briefly, Extraversion implies an *energetic approach* toward the social and material world and includes traits such as sociability, activity, assertiveness, and positive emotionality. Agreeableness contrasts a *prosocial and communal orientation* toward others with antagonism and includes traits such as altruism, tender-mindedness, trust, and modesty. Conscientiousness describes *socially prescribed impulse control* that facilitates task- and goal-directed behavior, such as thinking before acting, delaying gratification, following norms and rules, and planning, organizing, and prioritizing tasks. Neuroticism contrasts emotional stability and even-temperedness with *negative emotionality*, such as feeling anxious, nervous, sad, and tense. Finally, Openness to Experience (vs. closed-mindedness) describes the breadth, depth, originality, and complexity of an individual's *mental and experiential life*." (p.138, original italics).

Emotionality commonly appears in definitions of extraversion (positive) and neuroticism (negative); however the instrument used in the BHPS self-complete questionnaire is based more on behavioural and thought patterns without direct reference to affect, an approach preferable in the study of subjective well-being to minimise confounding (Eid and Diener 2004). Personality is measured just once, in Wave 15. It is assumed to be a stable trait therefore not subject to change throughout the period of measurement in this analysis. Substantial evidence suggests trait scores are very consistent over time (Headey and Wearing 1989; Mccrae and Costa 1991), although stability may be lower for younger adults (Suh et al. 1996).

MIMIC Model 2: Dispositional forces					
	Instrumental	*Emotionally isolated*	*Socially isolated*	*Integrated*	*Civic-minded*
Agreeableness	*0.03*	0.003	-0.019	0.006	0.012
Conscientiousness	**-0.04**	**-0.044**	-0.023	-0.008	**-0.031**
Extraversion	-0.014	**-0.058**	**-0.04**	**0.013**	**0.03**
Neuroticism	**-0.025**	-0.021	-0.007	**-0.022**	**-0.046**
Openness to experience	-0.014	**-0.064**	**-0.05**	**0.022**	**0.059**
Constant	**-1.209**	0.069	-0.246	**-0.647**	**-1.268**
AIC	63049.26				
N	12,298				

Table 4.9 MIMIC model with "big 5" personality predictors of latent class membership.

lazy (C - reverse-scored) 8. Is outgoing, sociable (E) 9. Gets nervous easily (N) 10. Values artistic, aesthetic experiences (O) 11. Is considerate and kind to almost everyone (A) 12. Does things efficiently (C) 13. Is reserved (E - reverse-scored) 14. Is relaxed, handles stress well (N - reverse-scored) 15. Has an active imagination (O)."

Four of the five personality traits exert a significant influence on social connectedness. Conscientiousness makes membership of instrumental, emotionally isolated and civic-minded less likely than the traditional, while extraversion and open-mindedness make integration and civic-mindedness more likely and isolation less likely. The traditional appear to be the most neurotic, with all other classes having negative coefficients which are statistically significant in the case of the instrumental, integrated and civic-minded classes. Agreeableness does not appear to influence patterns of connectedness with the possible exception of a borderline positive effect on bring instrumental.

Table 4.10 shows MIMIC Model 3 with life satisfaction as a single predictor. Significant differences between the classes are evident, with higher life satisfaction making membership of the integrated and civic-minded more likely than the traditional, and membership of the emotionally isolated and socially isolated less likely. The instrumental have a satisfaction level comparable to the traditional.

MIMIC Model 3: Life satisfaction					
	Instrumental	*Emotionally isolated*	*Socially isolated*	*Integrated*	*Civic-minded*
Life satisfaction	*0.065*	**-0.188**	**-0.137**	**0.128**	**0.1**
Constant	**-2.452**	**-1.399**	**-1.406**	**-1.587**	**-0.975**
AIC	63475.69				
N	13,724				

Table 4.10 MIMIC model with life satisfaction predicting latent class membership

4.4.2 Relative forces

The above descriptions illustrate considerable differences in both sociological and dispositional factors. The final MIMIC model (Table 4.11) includes the socio-demographic factors, the big 5, and life satisfaction in a single model in order to explore which of the controls exert the strongest influence on connectedness, and which, if any, can be explained by confounding[13].

On the whole, the significant coefficients reported above hold firm in MIMIC Model 4, and the model does not 'explain away' any of the proposed causes of connectedness. The effects of the big five are reduced in terms of significance, with neuroticism now only significantly lower

[13] I reduce the number of parameters by excluding class from this model, in order to facilitate model convergence

among the integrated and openness being a predictive trait only for the integrated and the civic-minded. The differences between classes are shown, for illustrative purposes, as bivariate statistics in Table 4.12.

MIMIC model 4: socio-economic factors and personality					
	Instru-mental	*Emotion-ally isolated*	*Socially isolated*	*Integrated*	*Civic-minded*
Age	**0.039**	**0.049**	-0.018	**0.084**	**0.024**
Age Squared/ 10	< 0.01	< 0.01	< 0.01	**-0.001**	< 0.01
Full time study (ref cat = employed)	0.065	-0.185	0.152	-0.099	-0.038
Unemployment (")	0.370	*0.493*	**0.962**	**-0.493**	**-0.428**
Retired/ Caring for home (")	0.233	-0.071	*0.422*	**0.468**	0.195
Long term ill (")	**0.617**	**0.729**	**0.481**	-0.015	0.034
Divorced/ sep (ref cat = married/ cohabiting)	-0.171	**0.391**	0.247	**-0.438**	**-0.199**
Widowed (")	0.205	**0.500**	**0.637**	-0.121	0.059
Never married (")	-0.181	0.101	**-0.440**	**-0.392**	**-0.186**
Live alone	0.229	-0.069	*-0.350*	**0.667**	**0.317**
Female	**-0.415**	**-0.686**	0.010	**0.124**	-0.073
Log income	0.051	**-0.166**	-0.090	**0.429**	**0.167**
Agreeableness	0.005	-0.015	**-0.050**	0.006	0.002
Conscientiousness	*-0.028*	-0.024	0.003	**-0.048**	-0.013
Extraversion	0.016	*-0.027*	**-0.039**	**0.049**	**0.024**
Neuroticism	0.008	0.011	0.001	**-0.028**	-0.009
Openness to experience	*0.024*	*-0.029*	-0.011	**0.078**	**0.034**
Constant	**-4.140**	*-1.499*	-0.147	**-7.278**	**-2.793**
AIC	56911.14				
N	11306				

Table 4.11 MIMIC model with socio-economic factors and "big 5" personality traits

To compare effect sizes, I use odds ratios for ease of interpretability. The odds ratio, for example, of never having married on being socially isolated compared to traditional, all else being equal, is 0.64 while the full scale of extraversion has relative odds of 0.44. The relative odds of being retired are 1.60 on being integrated, while the full scale of openness to experience would increase the odds by a factor of 5.14. It is evident, therefore, that both psychological and socio-economic factors have strong independent effects on connectedness.

	All	*Instru-mental*	*Emotion-ally isolated*	*Socially isolated*	*Tradition-al*	*Integra-ted*	*Civic-minded*
Life satisfaction	5.3	5.3	**5.0**	**5.0**	5.2	**5.4**	**5.5**
Income (per month)	2619	**2216**	**1806**	**1940**	2582	**2725**	**2868**
Routine/ semi-routine	24%	**27%**	**36%**	**33%**	**26%**	**21%**	**12%**
Unemployed	3%	2%	2%	3%	4%	**2%**	**1%**
Age	45.7	**53.1**	**54.6**	**49.6**	**42.8**	45.4	**49.2**
Extraversion	13.3	12.8	**11.8**	**12.2**	13.1	13.4	**13.7**
Openness	13.2	**12.5**	**11.3**	**11.8**	13.0	**13.3**	**13.8**

Table 4.12 Sample and class means for selected predictor variables, shown for ease of interpretability; figures in bold are significantly different to the grand sample mean at p < 0.05

4.5 LCA Results (Time 2)

In order to ascertain whether patterns of connectedness change over time, the LCA model is repeated for Time 2 (Waves 14 and 15 from 2007-8). Table 4.13 shows how the sample changed between the waves selected for analysis. Of the 14,196 individuals present at Time 1, 3,205 left the panel before Time 2. This leaves 10,991 individuals who were present at both times for whom change in connectedness can be measured. The Time 2 sample includes 1,921 new panel members which are included in the Time 2 model.

	N
Time 1	14,196
Attrition T1-T2	-3,205
New panel members	+1,921
Total Time 2	**12,912**

Table 4.13 Sample changes Time 1 – Time 2

The Time 2 model is constructed exactly as the Time 1 model, with identical indicator variables and model constraints. The results are shown in Table 4.14. The nature of the classes, firstly, is similar to Time 1, although with some small changes. The number of friends, for example, has declined in each of the three isolated classes. The biggest drop is by about 0.5 in the socially isolated who had 1.88 friends on average in Time 1, but 1.38 in Time 2. The numbers of organisations and level of social support remain very similar in both times. For the purposes of this section of analysis, we assume the classes are equivalent at both time points and compare

class assignments to estimate stability[14]. The sizes of the classes, secondly, are also broadly similar at both times. Among the well-connected, the traditional class shrinks from 43% at Time 1 to 38% at Time 2; the civic-minded class also reduces in its relative size to 13% from 16%, while the integrated class grows from 25% to 29%. There are also changes in the isolated classes; the socially isolated increase from 5% to 8%, and the instrumental from 6% to 8%, at the same time as the emotionally isolated class shrinks from 5% to 3% of the sample. Socio-economic reasons for these shifts are considered in Chapter Six.

Class label	Class 1 *Instrument-al*	Class 2 *Emotional isolation*	Class 3 *Social isolation*	Class 4 *Traditional*	Class 5 *Integrated*	Class 6 *Civic-minded*	Total
Friends	0.99	0.35	1.38	3	3	2.99	
Organisations	1.26	0	0	0	1	2.32	
social support	1.56	1.17	1.57	1.71	1.76	1.77	
n	1052	407	1077	4898	3772	1706	**12,912**
%	8.1%	3.2%	8.3%	37.9%	29.2%	13.2%	**100.0%**

Table 4.14 Results of LCA model at Time 2 including indicator means and class sizes

4.5.1 Turnover and methodological implications

Among the individuals who are present in the panel at both times, the class assignment at the two times are compared. Table 4.15 shows, by connectedness at Time 1, the proportion remaining in the same class four years on. Of the 10,991 individuals who stay in the panel over this period, 45% have the same type of connectedness at both times. The chances of having non-changing connectedness are far higher among the non-isolated classes; it is above 50% for the traditional and around 43% for the integrated and civic-minded. The emotionally isolated are the most likely to change, with just 22% remaining in this most isolated class after four years. Of the instrumental class, 31% remain and 29% of the socially isolated.

The high turnover of memberships in organisations has been remarked upon in the social capital context. Warde et al. (2003), for example, show that membership at any point between 1991 and 1995 to be far higher than continued membership throughout the period. The authors note that the volatility may reflect a "…flighty attitude towards activism" (p. 524), but also propose that weak ties developed during membership are likely to last beyond the period of membership. For the research questions to be address in this thesis, however, I make the

[14] Chapter Six includes a more detailed discussion on measurement invariance and its consequences.

opposite assumption about any lasting effects. It is assumed that organisation-based activity provides opportunities for social interaction which in turn brings about psychosocial resilience, and a reduction in that social activity will have immediate consequences for resilience.

Class at Time 1	% same class at both times
Instrumental	31.1%
Emotionally isolated	22.1%
Socially isolated	29.3%
Traditional	52.8%
Integrated	43.2%
Civic-minded	43.7%
All	**45.0%**

Table 4.15 Percentage remaining in same class of connectedness four years on; N = 10,991

4.6 Summary and conclusions

The confirmatory analysis in this chapter has produced a six-category variable for use as an explanatory variable. The hypothesised states of connectedness deemed crucial have been specifically modelled and include two types of social isolation and two types of social integration. Each of the six types of connectedness identified has qualitative and quantitative differences in terms of the indicator variables. The distinction in latent class indicators is echoed in the sociological, economic, and psychological profiles of each class. This typology is unlike those that have gone before due to the framework used to hypothesise the nature of classes and the resulting choice of indicator variables. However, there are areas of overlap with existing research adding validation to the interpretation of the models. For example, class 6 has much in common with one of the three groups found in Li et al.'s (2008) latent class typology of participation, and indeed the borrowed name 'civic-minded' reflects the similarity. The commonality is not only in activity with organisations but also in their socio-economic status; they are more likely to be professional, better-off, and older than those with other patterns of connectedness. The integrated class with their social ties both informal and organised are similar to members of Cattell's (2001) 'heterogeneous' network type who tend to have ties to dissimilar others, while the 'traditional' class, with members emphasising the importance of friendships and family rather than more formal structures, also resonates with results of this analysis.

Those with restricted networks are identified in all the typologies of connectedness in varying forms. Li et al. (2008) describe a class who are 'inactive' in terms of participation; Fiori et al. (2006) identify a 'restricted' type of network among older people; young people too may have restricted networks, such as Bellotti's 'cliques' (2008). Cattell (2001) labels the group 'socially excluded'. Again the description of its make-up has resonance with the results of the present study, with those in this bracket being more likely to be unemployed and single.

The isolated are likely to be under-represented in social surveys as they are harder to reach and more likely to drop out of the study, and accordingly the estimates of class membership probabilities for the more isolated classes may be conservative. Despite the potential difficulty of reaching these corners of society, the results of this analysis expose distinctions in ways of being isolated, this being an advantage of a quantitative approach with a large sample size. Using social support as the main distinguishing factor, there is strong evidence for two ways of being isolated: socially and emotionally. Network size differences are also evident with the socially isolated having an average of 1.9 friends, while the emotionally isolated have just 0.4. The importance of the distinction is evident in loneliness research which finds that those who are socially isolated (i.e. have few friends) but have loving fulfilling relationships (i.e. high perceived support) may be perfectly happy with their personal network (Cacioppo and Patrick 2008). However, I find that the life satisfaction of the two groups to be similar in the bivariate analysis. Further to the two distinct patterns of isolation, this analysis also differs from prior typological studies in identifying a class labelled 'instrumental' who constitute 6% of the population who have restricted informal connectedness but who choose to participate in groups and organisations. Modelling this group allows us to test whether organisational activity has greater benefits when in combination with the 'necessary condition' of a strong informal network.

A second significant outcome of this exploration of patterns of connectedness is the apparent fluidity in the individual's status over time. Around half of the population will shift from one pattern of connectedness to another in a period of four years. The findings on the extent of volatility of connectedness indicated a need for careful analytical strategy. Resilience will be considered in two parts; firstly, the next chapter is given to understanding resilience among those with non-changing connectedness, and secondly, Chapter Six attends to the cause and effect of changes in connectedness.

Chapter 5. For whom money matters less: non-changing connectedness as a resilience resource

In the previous chapter the latent variable for connectedness was developed. In this chapter, and the two that follow, the latent class assignment is treated as observed and is utilised as an explanatory variable for testing hypotheses. The potential impact of misclassification of connectedness is minimal due to the near-perfect entropy score in the latent class analysis (0.97), and I consider the advantages of treating this variable as observed, namely the relative simplicity and flexibility of modelling, to outweigh the disadvantages. The potential for bias is examined in section 5.10.

The analysis in this chapter tests the effect of financial circumstances on SWB for each type of social network identified in Chapter Four, for a subsample of individuals for whom connectedness type was the same in 2003/4 and 2007/8. This analysis of the "non-changers" facilitates the analysis and produces results unclouded by the complexity of dynamic connectedness. By looking separately at the non-changers, in effect the resilience resource is held as a time-invariant measure, allowing the relationship between financial circumstances and well-being through time to be explored in relation to the static resource. Conclusions are therefore focused on the differences in life satisfaction under conditions of adversity and non-adversity in relation to a resource steadily available during the time under study. Among the "changers", circumstances or events may influence both connectedness and personal finances, or indeed a change in connectedness may cause a change to the financial situation, and vice versa. In other words, a focus on the non-changers means that changes to connectedness are ruled out as a confounder of changing financial circumstances and SWB. In summary, the non-changers are analysed separately here in part for analytic manageability, and in part for the clarity and interpretability of the results.

The means of testing the hypotheses is guided by the resilience literature. The modelling of resilience can be broadly divided into three types according to Fergus and Zimmerman (2005), of which two are applied here.[15] The first is the *compensatory* or *main effects* model, in which adverse effects are countered by a protective factor. In a multivariate model predicting the

[15] The third type, not relevant here, is the 'challenge model' is where risk serves as an inoculation, lessening the negative impact of future exposure to risk, where the relationship between risk and the outcome is non-linear.

outcome of interest, coefficients for the risk factor and compensatory factor would be expected to have opposite signs, that is, to be pulling in opposite directions. The effect sizes can determine whether the compensation is complete or partial.

The second type is the *protective factor* or *moderating effects* model. Here, an interaction term is included that contains both the risk and the protective factor. The term 'protective factor' was initially reserved for these types of model (Luthar et al. 2000). The purpose of these models is to test the hypothesis that the protective resource has an effect that varies in magnitude according to the presence or absence of, or the level of, the risk factor. Masten and Wright (2010) describe "[a] classic 'protection factor'" as one which "shows stronger effects at higher levels of risk. In other words, the importance of the explanatory variable is greater when the risk is higher, suggesting a buffering or ameliorative influence" (p. 215). Luthar et al. (2000) further outline what might be considered as subtypes of the protective model. A protective-stabilising model is one in which the effect of the risk is annulled by the protective factor while in the protective-reactive model those with the protective factor experience reduced negative outcomes. Thus, the main mechanism for testing the hypotheses is the interaction term of the protective factor (connectedness) and the stressor (financial circumstances). In this chapter, and throughout the chapters to come, civic-minded is used as the reference category.

5.1 Hypotheses

As described in Chapter Three, financial circumstances are measured with three variables. The first two, household income and self-rated financial situation, are scales that run from low to high, where we assume that material well-being improves as the level gets higher. The interaction terms of the five non-civic-minded types of connectedness are expected to have positive interaction terms, which is to say that financial circumstances will make a greater contribution to the SWB of those with lower levels of the protective factor. The size of effect, gauged by the magnitude of the coefficient of the interactions will be higher for those lacking in the protective factor entirely, the isolated. The traditional and instrumental will also have positive interaction terms, although not to the same magnitude as the isolated. The third indicator of financial circumstances is the subjective assessment of the current situation as being better or worse compared to the previous year. "Worse off" is a direct measure of stress, and as such the direction of effect of the interaction will be in the opposite direction to the scale measures. As we expect the gap in SWB by connectedness to be greater during times of stress, the interaction between a lack of protective factor (i.e. isolation, or no secondary ties)

will be negative. The gap between stress and non-stress for the isolated will be larger than for those with the protective factor.

The pattern of narrowing will be evident in two ways, which are equivalent ways of expressing the same phenomenon. The gap between good times and bad times will be greater for the isolated than the well-connected, and the gap between the SWB of the different connectedness types will be greater in difficult circumstances than when things are going well. This is summarised into the single overarching hypothesis:

> H_1: The SWB gap between connectedness types will be greater under conditions of financial stress and narrower when things are going well.

And specifically:

> $H_{1.1}$: The interaction terms of connectedness with income and with subjective financial situation will be positive compared to the reference category of civic-minded, while
>
> $H_{1.2}$: The interaction terms with the stressor 'worse off' will be negative
>
> $H_{1.3}$: The magnitude of effect will be largest for the emotionally isolated, followed by the socially isolated. Traditional and instrumental classes will have more moderate differences while the smallest gap will be evident for the integrated.

5.2 The data sample

The data used are from the last seven waves of the BHPS, from 2002 to 2008. Using the unique identifier of the respondent, the seven waves were merged into a single dataset and the connectedness variables from the output of the LCA models at the two time points are linked in.[16] From the connectedness class assignment a new variable is generated that identifies individuals who have the same class at both times, and these are labelled "non-changers".[17] This subsample of non-changers was extracted for analysis and converted into 'long' format with repeated measures within each individual denoted by 'year' which is numbered 1 to 7. The pooled sample size is 126,373 observations nested within 18,577 individuals (see Table 5.1). The "changers" includes both those for whom connectedness is known at both times where class assignment changes, as well as panel members who left after Time 1, and new members joining after Time 1. The subsample of non-changers is made up of 4,950 respondents which is 27% of the total sample, and 45% of respondents who had connectedness indicators available at both measurement points.

	N individuals	N observations
Whole sample	18,577	126,373
Non-changers	4,950	34,256

Table 5.1 Data sample size by format (person/ observation) and subsample

In order to understand the representativeness of this subsample, the means of several key variables for the changers and non-changers are presented in Table 5.2. This comparison addresses whether stability of connectedness is associated with any particular personal or socio-demographic factors. The statistically significant differences are shown in bold. The summary reveals that the two subsamples are not significantly different in terms of their level of household income and in life satisfaction. They also appear similar in terms of personality although there is a small but statistically significant difference in terms of neuroticism, the non-changers being slightly lower in this trait. There are some small differences in the demographic profile, with the non-changers being a year older on average, less likely to be

[16] The implications of using class assignment as if it were an observed rather than latent measure are discussed in section 5.10

[17] This is a rather strong assumption as we do not observe what happens between the two points of measurement in 2003/4 and 2007/8. However, examination of transition patterns in Chapter 6 will show that changes in connectedness tend to be to a class of a similar type, and that it is highly unlikely for an individual with an integrated type network would become isolated and then return to integration in a four-year period.

unemployed and in full time study, and more likely to be retired. These factors are controlled for in the analysis, though overall the differences between the non-changes and the changers are small. Life satisfaction is described in more detail below.

	changers	non-changers
Life satisfaction	5.22	5.26
Household inc	£2,156	£2,185
Age	**47.7**	**48.9**
% female	55.2%	55.4%
% unemployed	**2.8%**	**2.4%**
% ft study	**2.6%**	**1.8%**
% retired	**22.2%**	**23.9%**
Agreeableness	16.4	16.4
Conscientiousness	15.9	15.9
Extraversion	13.4	13.3
Neuroticism	**11.0**	**10.9**
Openness	13.3	13.2

Table 5.2 Means of key variables by connectedness changers or non-changers. Data are taken from a single wave, 2008, estimates highlighted in bold are statistically significant from the sample mean at $p < 0.05$

5.2.1 Life satisfaction of the changers and non-changers

The bivariate relationship between life satisfaction and connectedness is shown in Figure 5.1 where mean life satisfaction scores and 95% confidence intervals within each category of connectedness are shown for a single wave (2007). The relationship is shown for the changers separately to the non-changers. The emotionally isolated have lower life satisfaction than the more connected and the difference is statistically significant for all but the socially isolated. Those with high levels of connectedness on both the informal and formal axes, namely the integrated and the civic-minded, have higher life satisfaction than the isolated groups and the traditional. The instrumental have a level of SWB the same as the traditional. The satisfaction of the socially isolated is higher than the emotionally isolated which validates the need to treat these conditions differently in connectedness research.

Among the four non-isolated types, life satisfaction is a little higher among the changers than the non-changers. However, as the differences are substantively small (less than 0.1) and are not statistically significant, it is reasonable to assume that the effect of connectedness on SWB

does not depend on whether connectedness has recently changed or not. This assumption receives further attention in Chapter Six. The socially isolated, too, have a level of satisfaction the same regardless of whether they have had the same connectedness four years previously or not. The biggest gap, though not a significant one, is seen among the emotionally isolated where those who are chronically isolated have a satisfaction of 4.4 compared to 4.8 for those who have become isolated more recently.

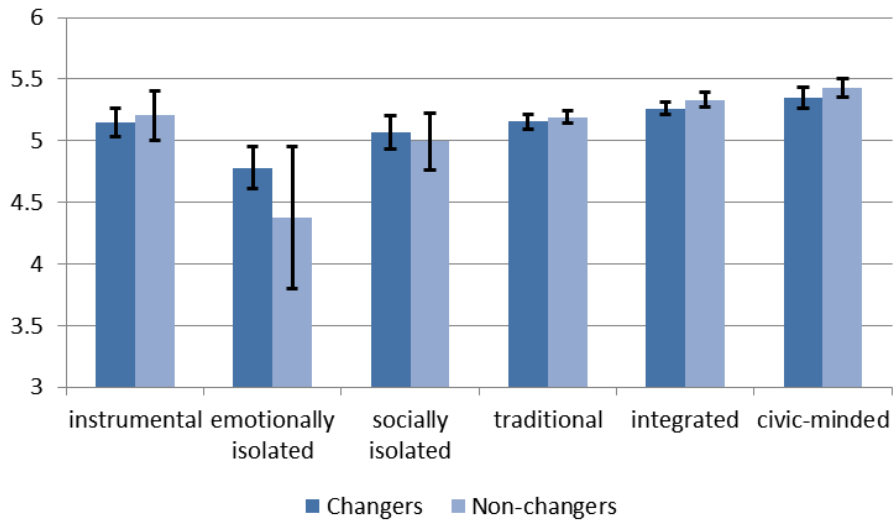


Figure 5.1 Mean life satisfaction in 2007 by connectedness type split by whether connectedness changed between 2003 and 2007. Error bars represent 95% confidence intervals

5.3 Variability in life satisfaction

When exploring the dynamics of subjective well-being, variances as well as means are of substantial relevance, as they indicate the level of changeability across people or groups. Previous research has shown low averages to be correlated with lower stability (Diener et al. 1999). The variance of life satisfaction over the 7 waves is calculated for each individual; the mean (with confidence intervals) of the variance is shown for each type of connectedness. In Figure 5.2 members of the emotionally isolated class have on average far higher variance in life satisfaction than the other classes, although not significantly higher than the instrumental and the socially isolated. The three larger and more social groups have lower variance, with the integrated and the civic-minded in particular standing out as having very stable patterns of life satisfaction. As the literature predicts, the overall pattern is that high life satisfaction is linked with stability, and vice versa.

There are implications of the observed patterns of variance for conclusions about resilience. If we assume that equal external shocks occur to the individuals within each class, it could be readily concluded that the lower the variance, the higher the resilience, for example, that the integrated and the civic-minded are most resilient, followed by traditional. However, this would be an inaccurate assumption due to the evidence that each class has access to different levels of economic resources, for example, household income is high among the civic-minded, and unemployment is high among the socially and emotionally isolated. The financial circumstances and occurrence of financial shocks are explored further below.

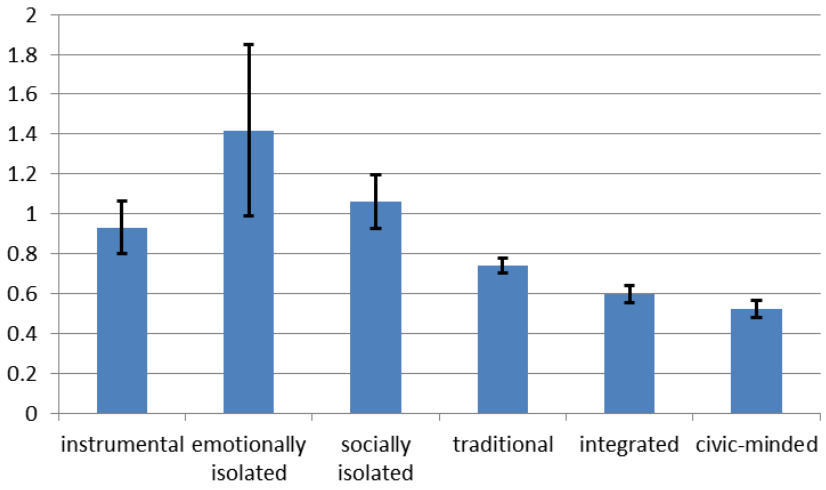


Figure 5.2 Mean within individual variances of life satisfaction over 7 waves, shown with 95% confidence intervals by connectedness type

5.4 Financial circumstances by connectedness

As established in Chapter Four, there is an income gradient across connectedness; the civic-minded have the highest incomes, followed by the integrated. Members of the traditional class have incomes in the middle of the range; the income of the instrumental is below the sample average, and lower still is the average income of the emotionally and socially isolated. The self-rated financial situation echoes this pattern (Table 5.3). It is of interest to see, on the other hand, that 'shocks' as defined by comparison to last year are similarly probable across the connectedness types, with the highest occurrences seen in the least and most connected classes, the emotionally isolated (24%) and the civic-minded (26%). The socially isolated, on the other hand, experience fewer shocks by this measure at just 17%. Similar incidence of problems paying for housing (see section 5.6.2) occurs across all connectedness types at between 3% and 6% Overall, despite indications of a favourable starting point financially for the well-connected, the worse off indicator shows that financial matters are not all rosy for the

well-connected. The needs-based explanation for the influence of connectedness is specifically examined in section 5.10.

	household monthly income	self-rated fin. Sit	self-rated worse off	probs paying housing
instrumental	1965 (33)	2.92 (0.02)	0.20 (0.01)	0.03 (0.00)
emotionally isolated	1654 (39)	2.59 (0.05)	0.24 (0.02)	0.06 (0.01)
socially isolated	1871 (21)	2.82 (0.02)	0.17 (0.01)	0.04 (0.00)
traditional	2314 (12)	2.90 (0.01)	0.22 (0.00)	0.05 (0.00)
integrated	2582 (20)	3.05 (0.01)	0.23 (0.00)	0.04 (0.00)
civic-minded	2840 (29)	3.22 (0.01)	0.26 (0.01)	0.03 (0.00)

Table 5.3 Means with standard errors in brackets of financial circumstances, occurrence of financial shocks by connectedness

5.5 Stability and learning effects

The use of panel data incurs an additional source of potential error, namely that the patterns of responses may be influenced by the respondents having seen the question before. To explore the stability of life satisfaction, wave on wave correlations are calculated and are shown in Table 5.4. The correlations range from 0.22 to 0.46 and tend to be smaller where there is a longer time lapse between observations. Between 2006 and 2007, for example, the correlation is 0.46, but between 2002 and 2006 is just 0.22. Though life satisfaction displays a degree of stability that is consistent with the influence of personality or adaptive processes the larger part of the variation must stem from other effects, including situational influences, measurement error, or learning effects.

	Life satisfaction						
	2008	2007	2006	2005	2004	2003	2002
2008	**1** 14,419						
2007	**0.39** 13,654	**1** 14,873					
2006	**0.39** 13,234	**0.46** 14,057	**1** 15,392				
2005	**0.35** 12,762	**0.38** 13,489	**0.44** 14,425	**1** 15,617			
2004	**0.24** 12,307	**0.26** 12,968	**0.28** 13,811	**0.32** 14,492	**1** 15,791		
2003	**0.23** 11,885	**0.27** 12,521	**0.26** 13,290	**0.32** 13,869	**0.46** 14,657	**1** 16,238	
2002	**0.23** 11,541	**0.22** 12,139	**0.25** 12,857	**0.26** 13,385	**0.36** 14,082	**0.43** 14,954	**1** 16,597

Table 5.4 Pairwise correlations between life satisfaction scores over 7 waves (2002-2008); all statistically significant at p<0.01; N for each pair shown beneath

Ehrhardt et al. (2000) analyse within person correlations of life satisfaction using German panel data and find that measurement error deceases over time, in part due to aging (i.e. life experience) but mostly due to learning effects from participation in the panel. I examine learning effects by comparing the change in correlation coefficients for each pair of years over time under the assumption that, if learning effects were at work, there would be a smaller degree of error and therefore stronger correlations at later times than earlier times (ibid.). There is little evidence of learning effects in this sample, with the correlations between single years (highlighted in blue) showing fluctuations rather than a general trend. To explore the possibility further, Table 5.5 shows the correlations of year on year life satisfaction for the sub-sample of those who were present at all 7 waves and with non-missing life satisfaction values (n = 8,844). There is no evidence of a learning effect here either. Given that the panel did not begin in 2002, perhaps the learning effects had taken place earlier in the first years of reporting life satisfaction. It is concluded that learning effects are not likely to influence the observations of life satisfaction differentially over the seven waves, although it must be accepted that newer panel members may be more susceptible to error in evaluating their satisfaction.

The difference between tables 5.4 and 5.5 is nonetheless illuminating in another important way, namely that the year on year correlations are far higher in the sample restricted to those present at all waves. This indicates that there is higher stability in the life satisfaction of those who persist in the panel, and those who leave have life satisfaction that is more volatile. This is

significant for the interpretation of the results because analysis based on the sample of only those present at all waves is likely to produce results that are likely to reflect an atypical level of stability in satisfaction. Any results regarding the influence of financial hardship on satisfaction may therefore underestimate the strength of effect as respondents with stable happiness are more likely to be present.

	Life satisfaction						
	2008	2007	2006	2005	2004	2003	2002
2008	1						
2007	0.61	1					
2006	0.59	0.64	1				
2005	0.52	0.55	0.59	1			
2004	0.54	0.55	0.58	0.59	1		
2003	0.50	0.53	0.54	0.54	0.61	1	
2002	0.48	0.49	0.51	0.52	0.57	0.57	1

Table 5.5 Correlations of wave on wave life satisfaction for the 8,844 cases present at all 7 waves with non-missing life satisfaction values

5.6 Modelling strategy

A multilevel modelling framework is used to analyse the data in which the longitudinal data are taken to be hierarchical in nature with measurement observations (level 1) nested within individuals (level 2)[18]. Multilevel modelling of observations within individuals is used with the aim of demonstrating that financial circumstances that vary through time have a differential impact on SWB depending upon connectedness, while accounting for clustering of observations within the individual due to unmeasured traits and circumstances. The degree of similarity among the observations within-person, compared to between-person is made explicit through the residual variances and expressed through the Intraclass Correlation Coefficient (ICC).

Covariates are included that are time-varying (such as income, job status and marital status) and time-invariant. The main time-invariant, or person-level, predictor used in the analysis is connectedness, not based on its inherent invariability but due to the purposeful extraction of the subsample of respondents for whom connectedness did not change between the two

[18] Strictly speaking I am 'missing' a level here, namely the household in which the individuals are clustered. In the seven years of observations, many individuals have moved house, children have left home and got their own place and so forth. To include the household level would necessitate exclusion of these cases which may introduce bias to the models. In the analysis of a single time point in Chapter 7, household is included as a level in the model.

measurement points. The 7 years selected for examination are assumed to be drawn from a random sample of 7-year periods. A linear variable 'year' is included to capture average change over time, and therefore age is kept as a fixed value (mean age across non-missing values) to avoid collinearity.

Year-on-year fluctuation in SWB and economic circumstances are the primary interest in the analysis. However, the ordering of observations remains important for two main reasons. Firstly, adaptation may take several years depending upon the type of shock; 'habituation' to changes in income, for example, is shown to longer than a year (Di Tella et al. 2010); therefore, lagged effects of income in terms of change since prior waves are also included in the analysis[19]. Not only does this provide a means of increasing the explanatory power of the model but it is also a way to shed light on the possible mechanisms of effect. Evidence of variation in adaption by connectedness would provide evidence for an alternative mechanism of effect. Secondly, year is also included as a control variable. As shown above, there is no evidence to suggest learning effects. A significant effect year would therefore suggest a pattern relating to the order of the observed outcome, namely that a general trend is occurring over the period under study. The learning effects demonstrated above would predict a significant effect of year. Alternatively it may proxy for a period effect, for example, an overall lowering of life satisfaction in response to consequences of the financial crisis beginning in late 2007. The addition of time as a covariate means that technically the model is a growth curve. In many applications of growth curve models, time is meaningfully sampled (Singer and Willett 2003). In contrast, here the 7 years selected for examination are assumed to be drawn from a random sample of 7-year periods, although more 'shocks' were observed in 2008 compared to earlier waves, and this is examined in section 5.10.

The random intercept parameter is based on the residuals from the level 2 unit means and can be interpreted as the level of variation remaining at the person level after accounting for the X-variables in the fixed part of the model. This is compared to the total variation and expressed as an intra-class coefficient (ICC). Although in theory, a random slope could be added for each explanatory variable, they are restricted here to just two so that the models remain parsimonious and not overly computationally demanding. The degree to which they co-vary with the random intercepts is of substantive interest. Random slopes are included for year and

[19] As I go on to describe in section 5.7.1, the variable used is more accurately described as 'differenced' income, as the *difference* in income between current and prior time point is used rather than the *actual income value* at a prior time point. However, the term 'lagged income' is used in preference to 'differenced income' for its semantic clarity.

for income thereby allowing an examination of the degree to which the clustering of life satisfaction within individuals is dependent upon time and income.

5.6.1 Centring of predictors

Centring predictor variables serves two main roles in multilevel modelling. Firstly, centring can aid interpretation of the coefficients in the fixed part of the model in the same way as it would in single-level regression models. This is particularly important for the interpretation of the main-effect variables when interactions terms are included (such as with connectedness in tables 5.6-5.12). Where random slopes are used in multilevel analysis, centring performs a second important function. As the estimation of the covariance between intercepts and slopes in dependent on the value of the predictor, centring on a meaningful point is recommended (Singer and Willett 2003; Snijders and Bosker 2012).

There are choices, particularly in longitudinal analysis, about whether to centre on the grand mean or on what Singer and Willett (2003) describe as 'within-context centring', which includes the possibilities of within-person centring either on the mean or at the initial time point. Throughout the analysis household income has been centred on median income for all respondents at that given wave. The wave medians were computed from the person-level or 'wide' data so that greater weight is not given to those present at more waves (ibid). Because small increases in income occur in each of the 7 waves, the wave median is chosen as the centre point in preference to the grand median across all waves so that distance from the mean is not exaggerated in earlier waves. Year is also centred on the mid-point.

5.6.2 Controlling for hardship

As well as the principle of marginal utility of income, there may also be a threshold effect. An alternative influential approach is to consider a threshold representing a 'subsistence level' (Frey and Stutzer 2002) or 'poverty line' (Berthoud and Bryan 2011) below which the basic needs of existence may not be met. The difficulty in empirical application of such a threshold is the variation in suggested levels which range from, for example, $10,000 per year (Frey and Stutzer 2002) to €800 of disposable household income per month (Wolbring et al. 2011). Additional difficulty is added when considering the range in living costs throughout the UK. Instead of searching for a numerical poverty line, although at a potential cost of objectivity, an alternative approach is taken to be able to control for serious financial struggle in which basic needs or security cannot be met or are threatened.

As the key indicator of serious financial struggle, the following question is used: "many people these days are finding it difficult to keep up with their housing payments. In the last twelve

months would you say you have had any difficulties paying for your accommodation?" This question is addressed to both mortgage payers and renters, but excludes any households owned outright. While it cannot be supposed that these households are immune to financial shocks, it can be assumed that ownership of an asset provides some degree of financial security. Those who own their homes outright are recoded from "not applicable" to "no problem" to minimise the number of missing values in the analysis. This deprivation indicator comes from the household respondent module of the survey and so is the answer of a single household member only, which is subsequently imputed for all members of the household. The primary purpose of this variable is to serve as a control factor to ensure that any effect of objective income is understood as an effect of adaptation to change in lifestyle and status rather than a direct consequence of the extreme stress of being unable to pay for essentials and the impact on health and relationships which may result.

5.7 Analysis part 1 – the effect of income on SWB

I specified a series of multilevel regression models on the conditional mean of Life satisfaction. Initially, a *variance components* or *empty* model (Table 5.6) was run which provided the intra-class correlation (ICC) statistic before any covariates are added. The outcome variable is life satisfaction, and the person ID is used as the level 2 identifier. This model uses all 33,232 observations with non-missing life satisfaction across 4,933 individuals. Each person has an average of 6.7 observations, this high average reflecting the selection based on cases with non-missing connectedness data at both times. The residual variance at level 2 is .83, compared to the total of 1.51 indicating that 55% of the variance in life satisfaction can be explained at the individual level. This is congruent with expectations based on other similar approaches with longitudinal data (e.g. Ehrhardt and Veenhoven 2000). The subsequent models are built up in blocks in order to assess the effect of additional covariates on the residual variances, the ICC and on model fit. Model fit is assessed through the Akaike's Information Criterion (AIC) which is a useful statistic for comparing log-likelihood models. It is calculated by 'penalising' the model fit by adding twice the number of model parameters to the -2 log-likelihood and thus summarises explanatory power and complexity in a single statistic[20]. Comparisons of AICs are valid only where models are based on the same set of observations. Because connectedness is non-missing on all observations in this subsample, models that differ only on the inclusion of the connectedness explanatory variable (with or without interactions) therefore have comparable AICs. The models including control variables, on the other hand, see a reduction in

[20] AIC is preferred over BIC here; the 'penalty' imposed for the number of parameters in the calculation of BIC is multiplied by the log of the sample size and is thus harsher than the AIC in this respect (Verbeke and Molenberghs 2009)

the effective sample (and consequently the AICs) due to missing values on the control variables.

Table 5.6 includes a series of models that introduce time and financial circumstances as predictors. In Model 1A, centred year and centred household income are added as predictors of life satisfaction. Year has a small negative coefficient, significant here but dipping in and out of significance in later models once other covariates are included in the model. This suggests that members of the panel become less satisfied over the seven years of measurement. Later models with controls (e.g. Table 5.9) suggest that this is not driven by age or life-course variation in satisfaction.[21] Household income has a positive effect on life satisfaction; the coefficient size of 0.06 would suggest having an income of £4700 (p95) is worth just 0.1 points of satisfaction more than £700 per month (p5), which is a modest gain.

Model 1B differs from 1A in the addition of random slopes for year and household income, as well as the covariance between the random effects. The AIC of Model 1B suggests that the addition of random slopes for year and income improve the fit of the model to the data. The covariance between year and the individual random effects is neither substantively or statistically significant. The covariance of the random slopes for income and the random intercepts for the individual is negative and substantive at -.11 (standard error 0.01). The negative sign indicates that for individuals higher on SWB (i.e. intercept) the slope of SWB on income is shallower (weaker), and vice versa. In short, the effect of income is less for those higher than average on SWB, and more for those lower on SWB.

[21] The financial recession that hit in 2008 is ruled out as the cause of the pattern, see section 5.10

Financial circumstances								
	Null model		Model 1A		Model 1B		Model 1C	
	b	**SE**	**b**	**SE**	**b**	**SE**	**b**	**SE**
year			**-0.010**	**0.002**	**-0.010**	**0.003**	-0.004	0.003
household income			**0.053**	**0.009**	**0.060**	**0.012**	-0.001	0.011
fisit							**0.225**	**0.008**
betteroff							**0.041**	**0.013**
worseoff							**-0.096**	**0.014**
constant	**5.266**	**0.014**	**5.266**	**0.014**	**5.269**	**0.014**	**4.609**	**0.027**
random effects	**var**	**SE**	**var**	**SE**	**var**	**SE**	**var**	**SE**
random intercept: person	0.827	0.019	0.823	0.019	0.800	0.018	0.699	0.016
random slope: year					0.010	0.001	0.008	0.001
random slope: income					0.042	0.009	0.031	0.008
cov: intercept, year slope					-0.002	0.003	-0.002	0.002
cov: intercept, income slope					-0.105	0.011	-0.092	0.010
cov: year slope , income slope					0.000	0.002	0.000	0.002
occasion variance	0.686	0.006	0.685	0.006	0.634	0.006	0.626	0.006
Intra-class correlation	0.55		0.55		0.57		0.54	
AIC	92665.6		92454.5		92063.5		90488.5	
N: observations / individuals	33232 / 4933		33173 / 4933		33173 / 4933		33038 / 4932	

Table 5.6 Models 1A – 1C include financial situation covariates predicting life satisfaction; random slopes for year and income are included; coefficients that are statistically significant are highlighted in bold in the fixed part of the model

This is a finding of direct relevance for the research question; there is a great deal of individual variation between individuals in the extent to which income influences life satisfaction. The negative covariance can be interpreted substantively in more than one way. Firstly, it may suggest that money makes more of a contribution to the life satisfaction of people who are less satisfied with their lives. Secondly, it could reflect the marginal utility of income, namely that the happiness return from income for the relatively well-off is far smaller than those at the lower end of the income distribution. The second interpretation would suggest that even taking the log of income is not enough to capture the rate of diminishing returns. These possible explanations are tentative at this stage, with factors such as poverty or severe financial struggle unaccounted for. We now turn to the effects of the various dimensions of financial circumstances

When subjective indicators of financial circumstances are included (Model 1C), the coefficient for income loses effect size and statistical significance suggesting that its effect is entirely accounted for by perceptions of circumstances. 'Financial situation' is scored on a 0-4 scale and the coefficient of 0.22 therefore suggests that almost a full point of satisfaction can be gained by moving from 'finding it very difficult' to 'living comfortably'. The dummy variables for the subjective comparison to last year have independent and significant effects. Being better off has a direct effect of an additional 0.04 points of satisfaction while being worse off reduces it by 0.10. These effect sizes are consistent with loss aversion theory (Tversky and Kahneman 1991) which predicts that the cost of a loss is higher than the benefit of a gain of equal magnitude. The pair-wise correlations (Chapter 3, Table 3.4) indicate that feelings about current compared to last year's finances may also have an indirect effect through the main subjective rating variable. The addition of subjective indicators is accompanied by a notable reduction in the person-level residual variance to 0.70 and the occasion variance to 0.63, equating to a proportional reduction of error (PRE) of 8.6% at level 1 (compared to Model 1A), and 15.1% at level 2. The addition of subjective income indicators also sees the income-intercept covariance reduce to -0.09 suggesting that some of the relationship between the person residuals and income slope is explained.

5.7.1 The effect of habituation

The effect of income on happiness so far has been considered as a simultaneous effect, which is to say the effect of income at Time 1 on happiness at Time 1, and income at Time 2 on happiness at Time 2, and so forth. The section explores how income from the past influences current happiness in addition to current income; the models are shown in Table 5.7.

To test the effect of habituation to changes in income on SWB, 'change in income since t-1' is added to the model. This 'difference' variable captures change in income since the previous wave, one year ago. This approach necessitates the exclusion of the first wave since income at time minus one is not known and thus results in a reduction to the number of observations modelled and correspondingly to residuals and AICs. The difference between current and last year's income has a negative coefficient, which is to say that if last year's household income was higher than it is now (a positive value of the predictor) this has a negative effect on current subjective well-being. Model 2B includes a second income difference variable based on the difference between the change since t-1 and the change between t-1 and t-2. To paraphrase, if the latest change in income was more positive (better) than the last, the value of this predictor is positive and vice versa. To use 'pay-rise' as an illustrative example (although of course losses are also possible): if the latest pay-rise is better than the one before, then

there is a small benefit in terms of life satisfaction. It also shows that a pay-rise in itself is no guarantee of life satisfaction and its potential benefit is reduced if it does not match up to the last one. This pattern of results provides evidence that increases in income change material aspirations (Easterlin 2003), that is, a 'hedonic treadmill' (Brickman and Campbell 1971) effect is at work.

Lagged income				
	Model 2A		Model 2B	
Fixed effect	**b**	**SE**	**b**	**SE**
Year	**-0.010**	**0.003**	0.005	0.004
Household income	**0.090**	**0.015**	**0.120**	**0.018**
Income change t-1	**-0.027**	**0.010**	**-0.098**	**0.022**
Income change t-2			**0.036**	**0.010**
Constant	**5.270**	**0.014**	**5.245**	**0.015**
Random effect	**variance**	**SE**	**variance**	**SE**
Random intercept: person	0.820	0.019	0.854	0.022
Random slope: year	0.011	0.001	0.012	0.002
Random slope: income	0.053	0.011	0.039	0.011
Cov: intercept, year slope	-0.010	0.003	-0.020	0.004
Cov: intercept, income slope	-0.120	0.012	-0.123	0.013
Cov: year slope , income slope	0.000	0.003	-0.005	0.003
Occasion variance	0.615	0.007	0.607	0.007
Intra-class correlation	0.590		0.598	
AIC	78344.6		65105.18	
N: observations / individuals	28165 / 4927		23242 / 4910	

Table 5.7 Multilevel linear regression; outcome is life satisfaction; changes in income since past two waves are included as predictors; coefficients that are statistically significant at the 95% level are highlighted in bold in the fixed part of the model

A difference indicator for t-3 was also tested. The effect is substantively small and statistically insignificant. The lagged effects beyond t-2, therefore, are not considered to be worth the cost to the analysis in terms of sample size and are not pursued further in the analysis. The fact that changes in income lose significance at this point suggests that complete habituation occurs after 2 years, a conservative period of time when compared to Di Tella et al. (2010), who find lagged effects of up to 4 years after a change in income. The coefficient of current household

income in Model 2B is increased compared to previous models. It seems that income can bring larger benefits to SWB when seen in contrast to previous income levels.

5.8 Analysis part 2 – "compensating effects" models

Connectedness is now introduced to the model (Table 5.8) in the form of five dummy variables for connectedness types with the civic-minded, the most connected group, omitted as the reference category. Model 3A confirms that all five classes have lower life satisfaction than the reference group, although the difference is not statistically significant for the instrumental and is of borderline significance for the integrated. The differential is greatest for the emotionally (b = -.431) and socially isolated (b = -.542) and moderate for the traditional (b = -.264). Despite the relationship between income and connectedness, Model 3B demonstrates that these main effects of connectedness hold independently of the financial situation. The coefficient sizes of the connectedness types are modestly reduced.

Following Fergus and Zimmerman (2005) resilience can be interpreted from these compensating effects models by comparing the size of the coefficients. Applying these results in this way would suggest that being civic-minded more than compensates for feeling financially worse off than last year, at least compared to the emotionally and socially isolated, and the traditional. The socially isolated, for example, would need to have a self-rated financial situation around 2 points higher to achieve the same average life satisfaction as the civic-minded. Similarly, one who is isolated and not doing well financially would have a double price to pay in their satisfaction with life. This approach serves as a good benchmark for understanding the additive effects of connectedness and financial circumstances. The following section uses 'protective factor' or moderating effects models to delve deeper into resilience, to understand the differential effect of the resource at different levels of the stressor and in the presence or absence of a financial shock.

Financial circumstance and connectedness				
	Model 3A		Model 3B	
Fixed effect	**b**	**SE**	**b**	**SE**
Year	**-0.010**	**0.003**	-0.004	0.003
Instrumental	-0.111	0.076	-0.025	0.071
Emotional isolated	**-0.431**	**0.108**	**-0.315**	**0.103**
Socially isolated	**-0.542**	**0.085**	**-0.448**	**0.081**
Traditional	**-0.264**	**0.038**	**-0.183**	**0.035**
Integrated	**-0.085**	**0.043**	-0.051	0.039
Household income			-0.006	0.011
Financial situation			**0.222**	**0.008**
Better off than last year			**0.041**	**0.013**
Worse off than last year			**-0.100**	**0.014**
Constant	**5.446**	**0.033**	**4.742**	**0.040**
Random effect	**variance**	**SE**	**variance**	**SE**
Random intercept: person	0.817	0.018	0.690	0.016
Random slope: year	0.010	0.001	0.008	0.001
Random slope: income			0.031	0.008
Cov: intercept, year slope	-0.001	0.003	-0.002	0.002
Cov: intercept, income slope			-0.090	0.010
Cov: year slope , income slope			0.000	0.002
Occasion variance	0.640	0.006	0.626	0.006
Intra-class correlation	0.564		0.538	
AIC	92314.17		90195.84	
N: observations / individuals	33173 / 4933		33038 / 4932	

Table 5.8 Main effects models for connectedness and financial circumstances on life satisfaction. Statistically significant ($p < 0.05$) coefficients are highlighted in bold, and borderline significance is italicized ($p < 0.1$) in the fixed part of the model.

5.9 Analysis part 3 – "protective factor" models

Interaction terms between connectedness types and the indicators of financial circumstances are computed and added to the multilevel models one 'set' at a time, and can be seen in tables 5.9 and 5.10. Model 4A includes interactions between connectedness and household income. Wave-centred income is used to generate the interaction terms so that the simple effects of the classes of connectedness now signify the differences at average levels of income. The main effects of connectedness remain similar in magnitude and significance to Model 3A. The main effect of income, independent of the interaction terms therefore an estimate of the effect of income on the civic-minded, is not statistically significant and has a small negative value (-

0.013). Despite being better off, therefore, income does not predict SWB in this class. The interaction terms are all positive coefficients, which is to say that household income is more important in all of the other five classes of connectedness. The effect is statistically significant for the traditional. The effect size is notably large for the emotionally isolated (b = 0.114) and the instrumental (b = 0.143) where the coefficients are far larger than the average effect of log income of 0.06 (Model 1B); however, in this model neither reaches significance. To evaluate the goodness of fit of the model overall, I include a log likelihood ratio test comparing the model with interaction terms to a 'base' model without the interactions. The result of 12.32 with 5 degrees of freedom is statistically significant at the 95% level and indicates that the more complex model is better fitting. Model 4B includes the socio-demographic and personality trait control variables. The reduction in significance for the traditional and the effect sizes make evident that socio-economic and psychological features may to some extent be mediating the relationship between connectedness, money and happiness. However, confounding or mediation does not account for the full effect of connectedness, particularly when comparing the least to the most connected[22].

The modelling approach is replicated for self-rated financial situation in the same table, models 5A and 5B. The lowest answer category is coded as zero so that the main effect dummies for connectedness now represent the effect on life satisfaction when 'finding it very difficult'. It is evident that the socially isolated have a particularly difficult time as the coefficient has increased in magnitude to -.875, a substantial difference in life satisfaction when compared to the civic-minded in the same perceived financial situation. Likewise, the emotionally isolated, the traditional and the integrated all experience higher costs to their SWB when finding things very difficult compared to the civic-minded. These interactions echo the overall pattern seen with the objective income measure in that all connectedness classes show a stronger relationship between the perceived situation and subjective well-being when compared to the civic-minded. The coefficient is significant for the emotionally isolated (b = .042), the socially isolated (b = .148) and the traditional (b = .051), and is of borderline significance for the integrated. The log likelihood ratio test indicates that the goodness of fit improves when interaction terms with connectedness are added. With controls added to the model (5B) the interaction terms for the socially isolated and the traditional remain significant.

[22] To further check the robustness of the differences in income effects by connectedness, I regress income on life satisfaction separately for each connectedness group. The coefficients are shown in Appendix Table A1.6, and confirm that the effects of income are larger for the isolated groups, smaller for the integrated, and substantively and statistically non-significant for the civic-minded. The different method, without relying on interaction terms, therefore provides supporting evidence to the results of the protective factor models.

Protective Factor models: income and financial situation								
	Model 4A		Model 4B		Model 5A		Model 5B	
Fixed effect	**b**	**SE**	**b**	**SE**	**b**	**SE**	**b**	**SE**
Year	**-0.010**	**0.003**	**-0.010**	**0.003**	**-0.006**	**0.003**	**-0.007**	**0.003**
Instrumental	-0.088	0.076	-0.035	0.070	-0.131	0.144	-0.051	0.146
Emotional isolated	**-0.407**	**0.110**	**-0.296**	**0.117**	**-0.432**	**0.205**	-0.330	0.223
Socially isolated	**-0.525**	**0.086**	**-0.346**	**0.078**	**-0.875**	**0.154**	**-0.659**	**0.151**
Traditional	**-0.260**	**0.038**	**-0.087**	**0.035**	**-0.331**	**0.076**	**-0.182**	**0.075**
Integrated	**-0.089**	**0.043**	0.013	0.038	**-0.183**	**0.086**	-0.098	0.084
Household income	-0.013	0.029	0.014	0.028	0.000	0.011	0.004	0.011
Financial situation					**0.201**	**0.019**	**0.179**	**0.019**
Probs with housing			**-0.284**	**0.028**			**-0.156**	**0.028**
Instrumental*inc	0.143	0.075	0.132	0.073				
Emotional_isol*inc	0.114	0.102	0.106	0.110				
Socially_isol*inc	0.080	0.075	0.029	0.072				
Traditional*inc	**0.096**	**0.033**	0.052	0.032				
Integrated*inc	0.032	0.037	0.003	0.036				
Instrumental*fisit					0.036	0.042	0.018	0.043
Emot_isol*fisit					**0.042**	**0.063**	0.040	0.070
Socially_isol*fisit					**0.148**	**0.044**	**0.122**	**0.045**
Traditional*fisit					**0.051**	**0.021**	**0.043**	**0.021**
Integrated*fisit					*0.044*	*0.024*	0.039	0.024
Age (fixed)			**-0.029**	**0.005**			**-0.027**	**0.005**
Age squared (/10)			**0.034**	**0.005**			**0.031**	**0.004**
Full time study (ref cat = employed)			**0.169**	**0.049**			**0.165**	**0.049**
Unemployed (“)			**-0.329**	**0.039**			**-0.231**	**0.039**
Retired (“)			**0.060**	**0.030**			**0.073**	**0.029**
Caring for home/ family (“)			**-0.041**	**0.029**			-0.006	0.028
Long-term ill (“)			**-0.496**	**0.040**			**-0.434**	**0.039**
Divorce/sep (ref cat = married/ cohabiting)			**-0.289**	**0.032**			**-0.237**	**0.031**
Widowed (“)			**-0.243**	**0.048**			**-0.224**	**0.046**
Never married (“)			**-0.148**	**0.030**			**-0.139**	**0.029**
Live alone			**-0.103**	**0.026**			**-0.106**	**0.026**
Intermediate (ref cat = prof/ managerial)			0.013	0.020			0.036	0.020
Routine (“)			-0.011	0.026			0.025	0.025
Not work (“)			0.009	0.030			0.042	0.029
Female			**0.084**	**0.026**			**0.067**	**0.025**
Agreeableness			**0.026**	**0.005**			**0.028**	**0.004**
Conscientiousness			**0.039**	**0.004**			**0.036**	**0.004**
Extraversion			**0.014**	**0.004**			**0.014**	**0.004**
Neuroticism			**-0.071**	**0.003**			**-0.067**	**0.003**
Openness			-0.002	0.004			-0.003	0.003
Constant	**5.449**	**0.033**	**5.479**	**0.160**	**4.791**	**0.068**	**4.872**	**0.165**
Intra-class correlation	0.568		0.491		0.536		0.470	
AIC	91996.02		84743.40		90765.44		83811.10	
N: obs / individuals[23]	33173 / 4933		31402 / 4675		33139 / 4933		31374 / 4675	
Log Likelihood	-45978.01				-45361.72			
Log Likelihood base	-45984.17				-45368.06			
-2 LLR test (*signif at 5df)	12.32*				12.68*			

Table 5.9 ‘Protective factor’ models showing the differential effects of current finances on SWB across classes of connectedness. Random effects included but not shown.

[23] Adding controls reduces the effective sample size considerably, this is discussed in section 5.10

Protective factor models: worse off and better off				
	Model 6A		Model 6B	
Fixed effect	**b**	**SE**	**b**	**SE**
Year	*-0.005*	*0.003*	*-0.005*	*0.003*
Instrumental	-0.034	0.079	0.002	0.074
Emotionally isolated	**-0.466**	**0.113**	**-0.375**	**0.121**
Socially isolated	**-0.479**	**0.089**	**-0.336**	**0.082**
Traditional	**-0.265**	**0.039**	**-0.096**	**0.037**
Integrated	*-0.079*	*0.044*	0.020	0.040
Household income	**0.029**	**0.011**	**0.032**	**0.012**
Better off than last year	**0.067**	**0.033**	**0.082**	**0.032**
Worse off than last year	**-0.186**	**0.031**	**-0.172**	**0.031**
Probs with housing			**-0.233**	**0.028**
Instrumental*betteroff	-0.084	0.084	-0.095	0.086
Emotional_isol*betteroff	0.101	0.148	0.089	0.168
Socially_isol*betteroff	0.049	0.097	0.096	0.097
Traditional*betteroff	*0.065*	*0.037*	0.051	0.037
Integrated*betteroff	-0.028	0.042	-0.029	0.042
Instrumental*worseoff	**-0.199**	**0.082**	*-0.163*	*0.084*
Emotional_isol*worseoff	*0.260*	*0.134*	*0.274*	*0.147*
Socially_isol*worseoff	**-0.238**	**0.086**	-0.147	0.086
Traditional*worseoff	-0.016	0.036	-0.013	0.036
Integrated*worseoff	-0.004	0.041	-0.005	0.041
Age (fixed)			**-0.025**	**0.005**
Age squared (/10)			**0.031**	**0.005**
Full time study (ref cat = employed)			0.201	0.049
Unemployed (“)			**-0.254**	**0.039**
Retired (“)			**0.092**	**0.030**
Caring for home/ family (“)			-0.012	0.029
Long term ill (“)			**-0.462**	**0.040**
Divorce/sep (ref cat = married/ cohabiting)			**-0.297**	**0.032**
Widowed (“)			**-0.252**	**0.047**
Never married (“)			**-0.159**	**0.030**
Live alone			**-0.094**	**0.026**
Intermediate (ref cat = prof/ managerial)			0.023	0.020
Routine (“)			-0.004	0.026
Not work (“)			0.032	0.029
Female			**0.079**	**0.026**
Agreeableness			**0.026**	**0.004**
Conscientiousness			**0.039**	**0.004**
Extraversion			**0.013**	**0.004**
Neuroticism			**-0.071**	**0.003**
Openness			-0.002	0.004
Constant	**5.468**	**0.034**	**5.399**	**0.159**
Intra-class correlation	0.564		0.487	
AIC	91306.18		84153.71	
N: observations / individuals	33036 / 4932		31303 / 4675	
Log Likelihood	-45626.09			
Log Likelihood base	-45641.73			
-2 LLR test (*signif at 10df)	31.28*			

Table 5.10 ‘Protective factor’ models for financial shocks; random effects not shown

Protective factor model: habituation Model 7		
fixed effect	**b**	**SE**
Year	0.005	0.004
Instrumental	-0.102	0.081
Emotionally isolated	**-0.339**	**0.127**
Socially isolated	**-0.559**	**0.091**
Traditional	**-0.262**	**0.040**
Integrated	**-0.096**	**0.045**
Household income	-0.010	0.045
Income change t-1	-0.028	0.058
Income change t-2	0.016	0.028
Instrumental*income	0.159	0.114
Emotional_isol*income	**0.361**	**0.171**
Socially_isol*income	0.117	0.114
Traditional*income	**0.161**	**0.052**
Integrated*income	0.069	0.058
Instrumental*inc diff t-1	0.004	0.135
Emotional_isol*inc diff t-1	-0.285	0.182
Socially_isol*inc diff t-1	-0.058	0.151
Traditional*inc diff t-1	-0.078	0.065
Integrated*inc diff t-1	-0.037	0.073
Instrumental*inc diff t-2	-0.060	0.067
Emotional_isol*inc diff t-2	*0.144*	*0.078*
Socially_isol*inc diff t-2	0.033	0.075
Traditional*inc diff t-2	0.022	0.031
Integrated*inc diff t-2	0.005	0.035
constant	**5.431**	**0.035**
Random effect	**variance**	**SE**
Random intercept: person	0.837	0.021
Random slope: year	0.012	0.002
Random slope: income	0.036	0.011
Cov: intercept, year slope	-0.019	0.004
Cov: intercept, income slope	-0.116	0.013
Cov: year slope , income slope	-0.005	0.003
Occasion variance	0.607	0.007
Intra-class correlation	0.593	
AIC	65055.86	
N: observations / individuals	23242 / 4910	

Table 5.11 'Protective factor' model showing the differential effects of changes to income on subjective well-being across classes of connectedness.

Models 6A and 6B (able 5.10) explore the differential effects of being worse off or better off across levels of the protective factor. The log likelihood ratio test confirms that the goodness of fit of the model is significantly better with the interaction terms than without. Like the more general appraisal of finances, the cost of such a shock to life satisfaction differs across connectedness types. The instrumental and the socially isolated have negative and significant interaction terms indicating worse outcomes for those groups compared to the civic-minded when worse off than the previous year. The emotionally isolated have a borderline *positive* significant interaction term indicating that, counter to the hypotheses, they have a lower cost than the civic-minded to life satisfaction outcomes under conditions of economic hardship. While neither the main effect or any of the interactions for better off are statistically significant, we can see that the traditional appear to get a greater benefit to being better off, a finding not far from significance at p = 0.08. With the controls included (Model 6B), again the effects lose magnitude and significance although the direction of effect across the better off/ worse off interactions remain the same. The traditional and integrated do not experience a different life satisfaction outcome in the presence of a shock compared to the civic-minded. The civic-minded themselves are not immune to financial shocks; they experience a negative effect to the size of -.186 points of life satisfaction.

Table 5.11 includes the final 'protective factor' model, and includes the effects of changes in income over the last two years by connectedness type. The size of the coefficient for the interaction of traditional and current income has increased in this model to .161 (from .096 in Model 4A) and the emotional isolation interaction with income is significant and large (b = .361). The interactions of lagged income with emotionally isolation perhaps indicate that the effect of income for these groups is best understood in the context of habituation processes, as the coefficient for Time 2 income difference is borderline significant and positive. However, none of the coefficients relating to changes of income are statistically significant at the 95% level, and overall it is concluded that differing habituation is not an explanation for the effect of connectedness.

5.10 Robustness checks

This section seeks to address the potential for bias in this analysis. The first relates to the difficulty of measuring income with under-reporting found to be frequent among those reporting low incomes (Brewer et al. 2013). In order to address the impact of these error-prone observations, the protective factor models are re-run with the bottom 5th percentile of household income excluded. The cut-off value is £680 per month, and results in around 2,600 observations being dropped from the analysis. This approach is similar to Layard et al. (2008)

who find the income – life satisfaction relationship is modelled with more success when extreme values are excluded.

The results are shown in Table 5.12, and the impact on the results is clear. The interaction terms with household income were not significant in the full model for the instrumental and the socially isolated, and in the revised sample now have statistically significant or borderline coefficients indicating robust differential effects of income by connectedness. In addition, all the coefficient estimates are larger in magnitude suggesting that the income-life satisfaction relationship may be *underestimated* in the presence of very low income observations; this may reflect that the effect of connectedness is diminished among the most vulnerable in society, or that measurement error is indeed a problem. In revised Model 4D, again the presence of controls loosens the relationship; however, the coefficients all remain positive and the traditional interaction remains significant now as well as the emotionally isolated. With the low observations of income excluded, no substantive changes occur in the protective factor models on financial situation, better off and worse off, or income changes occur.

Secondly, to exclude the possibility that the results are a spurious reflection of the level of need within each class of connectedness, the same models are estimated with the lowest quartile of income observations dropped (also Table 5.12). The results are clearly not driven by individuals who find themselves in poverty, as the results in models 4E and 4F are strengthened rather than weakened, with all of the income interactions being positive and significantly different to the civic-minded, for whom income has no effect on life satisfaction. For all but the integrated the coefficients remain significant once the full set of control variables are added to the model. The coefficient estimates are also increased in magnitude in these models, a factor perhaps suggesting that measurement error in the bottom quartile (not just the very low) might influence the estimates. Overall, these checks have added to the robustness of the results; the interaction effects are robust to the addition of controls, are substantial in size and show that basic needs of the lesser connected is not the explanatory mechanism at work.

	P5 and below excluded				P25 and below excluded			
	Model 4C		Model 4D		Model 4E		Model 4F	
fixed effect	**b**	**SE**	**b**	**SE**	**b**	**SE**	**b**	**SE**
Year	**-0.010**	**0.003**	**-0.010**	**0.003**	**-0.007**	**0.003**	**-0.008**	**0.003**
Instrumental	-0.095	0.077	-0.043	0.071	-0.114	0.087	-0.059	0.081
Emotionally isolated	**-0.395**	**0.112**	**-0.285**	**0.119**	**-0.425**	**0.125**	**-0.343**	**0.134**
Socially isolated	**-0.524**	**0.087**	**-0.348**	**0.079**	**-0.623**	**0.096**	**-0.406**	**0.089**
Traditional	**-0.267**	**0.039**	**-0.099**	**0.036**	**-0.268**	**0.043**	**-0.103**	**0.040**
Integrated	**-0.099**	**0.044**	0.001	0.039	**-0.116**	**0.048**	-0.010	0.044
Household income	-0.038	0.039	0.001	0.038	-0.059	0.045	-0.001	0.044
Probs with housing			**-0.272**	**0.030**			**-0.283**	**0.033**
Instrumental*income	**0.237**	**0.099**	**0.226**	**0.097**	**0.293**	**0.131**	**0.308**	**0.130**
Emotional_isol*income	**0.305**	**0.152**	**0.484**	**0.174**	**0.575**	**0.199**	**0.767**	**0.223**
Socially_isol*income	0.125	0.108	0.048	0.107	**0.435**	**0.151**	**0.303**	**0.153**
Traditional*income	**0.169**	**0.045**	**0.113**	**0.044**	**0.171**	**0.053**	**0.108**	**0.052**
Integrated*income	*0.090*	*0.050*	0.063	0.049	**0.133**	**0.059**	0.089	0.057
Age (fixed)			**-0.030**	**0.005**			**-0.030**	**0.005**
Age squared (/10)			**0.035**	**0.005**			**0.034**	**0.005**
Full time study (ref = employed)			**0.170**	**0.052**			**0.167**	**0.057**
Unemployed (“)			**-0.308**	**0.044**			**-0.267**	**0.057**
Retired (“)			**0.068**	**0.031**			**0.124**	**0.035**
Caring for home/ family (“)			-0.021	0.030			0.022	0.034
Long term ill (“)			**-0.478**	**0.042**			**-0.510**	**0.050**
Divorced/ sep (ref = married/ cohabiting)			**-0.274**	**0.032**			**-0.272**	**0.035**
Widowed (“)			**-0.225**	**0.049**			**-0.258**	**0.057**
Never married (“)			**-0.147**	**0.030**			**-0.137**	**0.031**
Live alone			**-0.119**	**0.027**			**-0.130**	**0.032**
Intermediate (ref = prof/ managerial)			0.017	0.020			0.014	0.020
Routine (“)			0.001	0.026			0.012	0.028
Not work (“)			0.018	0.030			0.003	0.033
Female			**0.086**	**0.026**			**0.088**	**0.027**
Agreeableness			**0.027**	**0.005**			**0.026**	**0.005**
Conscientiousness			**0.039**	**0.004**			**0.040**	**0.005**
Extraversion			**0.014**	**0.004**			**0.014**	**0.004**
Neuroticism			**-0.071**	**0.003**			**-0.068**	**0.003**
Openness			-0.003	0.004			-0.002	0.004
Constant	**5.455**	**0.034**	**5.479**	**0.160**	**5.463**	**0.037**	**5.459**	**0.170**
Intra-class correlation	0.568		0.491		0.629		0.568	
AIC	87079.14		80426.43		66777.51		62131.18	
N: obs / individuals	33173 / 4933		29958 / 4668		24993 / 4542		23870 / 4330	

Table 5.12 Low values of income are dropped from the models; models 4C and 4D cut-off = £688 per month; models 4E and 4F cut-off = £1,235 per month.

The second potential source of bias is from the use of latent class assignments as predictors. Connectedness is utilised as if it were an 'observed' variable, which is to say that the class assignment is treated as definitive, and any variation in the class membership probabilities are not taken into account. It has been noted that this treatment of latent classification is problematic, and indeed "should be avoided" (Skrondal and Rabe-Hesketh 2004) and can lead to the possible underestimation of standard errors (Bolck et al. 2004). However, the risk of bias is mitigated here; the potential impact of misclassification is minimal due to the high entropy score in the latent class analysis (0.97) indicating that a good degree of accuracy was obtained in assigning cases to classes. Just 3% of cases are assigned to a class based on a probability of membership of below 90%. The compensation for this uncertainty is that the latent variable analysis allows us to include cases with non-complete data, which in itself would constitute a bias if excluded. To assess if the presence of this uncertainty biases the results in this analysis, a similar procedure as for income is followed; the protective factor models are fitted again with cases where class membership probabilities are below .90 excluded. None of the coefficient estimates are substantially altered in size or in level of significance, thus it appears that the uncertain nature of the latent class assignment has little impact on the results. This table is shown in the appendix, A1.1.

As noted in relation to the protective factor models, the addition of controls brought about a reduction in effective sample size of around 2000 observations. This high level resulting from the cumulative effect of a missing value on any one of the controls means that it is excluded from analysis. To understand the effect of this, I fitted each of the protective factor models (4A, 5A and 6A) again with the sample available from the models with controls (4B, 5B and 6B). The only changes evident were that significant coefficients relating to the emotionally isolated became non-significant in the case of income and financial situation; this may reflect the small sample size of this connectedness group or perhaps imply that missing values occur more frequently for this group. However, in a model of the restricted sample in which low income is excluded, the interaction between emotional isolation and income remains substantive and significant. It can be concluded therefore that cases with missing values on the control variables are not different to the rest in terms of the effects of connectedness on resilience.

The financial recession that began in 2008 had an effect on households, evidenced by the increase in feeling worse off compared to previous years. The third robustness check therefore tests that the results of the analysis hold with 2008 excluded. The models (appendix, Table A1.2) yield estimates that are similar in terms of magnitude and significance, and it is

concluded that the recession is not skewing the results. A further point of interest is that the models without 2008 still have a year coefficient that is negative and statistically significant. Thus, it is unlikely that the small average decline in satisfaction can be explained by the macro-economic conditions.

As described in Chapter Three, many researchers of life satisfaction prefer to treat the measure as ordinal, rather than continuous. As a final check for the robustness of the results in this chapter, the main protective factor models (4C, 5A and 6A) are re-specified as mixed effects ordered logit models in Stata 13. These are shown in the appendix, Tables A1.3-5. There are some small differences, for example, the instrumental and emotional isolation interactions with income, drop to borderline significance and the emotional isolation with financial situation interaction becomes non-significant. These aside, however, the results, remain largely unchanged. As others have concluded before (e.g. Ferrer-i-Carbonell and Frijters 2004; Blanchflower and Oswald 2004), the treatment of the outcome variable does not much alter the results.

5.11 Plotting the results

Figures 5.3 to 5.5 demonstrate the effect of the protective factor by plotting predicted values of life satisfaction for types of connectedness based on models of income, financial situation and worse off. Where the interaction coefficient was not statistically significantly different to the main effect the line is retain but dashed. Firstly, the 1st and 99th percentiles are used as predictor values of household income based on Model 4C and the linear relationship is shown in Figure 5.3. The difference between the high end and low end of the scale therefore represents the entire range of possible outcomes. It is apparent that the effect of income on life satisfaction is mediated by connectedness. The income-satisfaction relationship is a flat line for both the civic-minded and the integrated. This indicates that having both informal and formal social connections is associated with resilience to income level, and SWB can be maintained to a high level regardless of income. The satisfaction of the instrumental increases markedly as income increases; by the 99th percentile (£7,700/ month) they effectively overtake the civic-minded. The socially isolated and the traditional have a gentle slope across the range of income; they are parallel so the two groups experience the same benefit from increased income. The biggest benefit is seen among the emotionally isolated who close the gap from just under 1 point to zero (comparing to the civic-minded) as they move from being in the lowest to the highest income scenario.

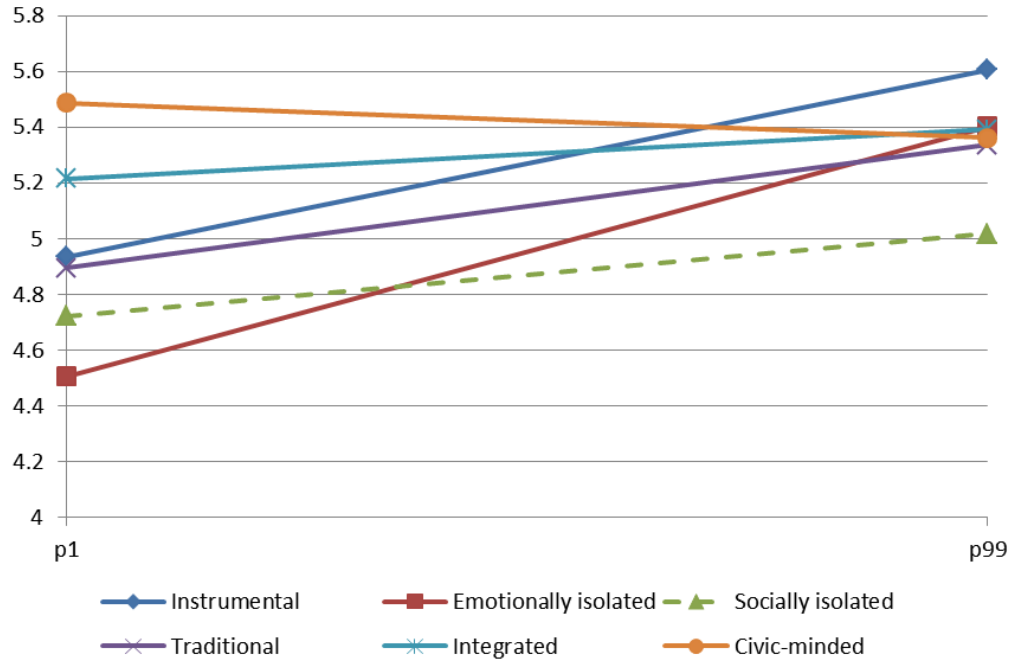


Figure 5.3 Plot of predicted values, based on Model 4c, of the different relationships between income and subjective well-being by connectedness.

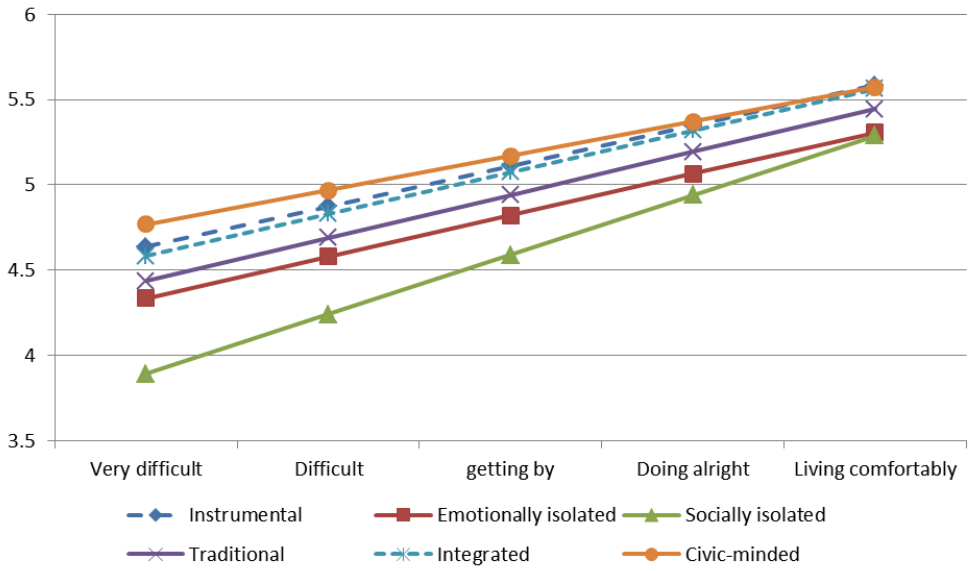


Figure 5.4 Plot of predicted values, based on Model 5A, of the different relationships between financial situation and subjective well-being by connectedness.

The slopes across the five possible answer categories of self-reported financial situation are shown in Figure 5.4. Predictions are based on Model 5A and income is held at the wave median. The lines for the civic-minded, integrated and instrumental are close, all ending at the same level of life satisfaction when living comfortably. Under more stressful conditions the integrated and instrumental have slightly lower life satisfaction, and the differences in gradient to catch-up with the civic-minded are gentle. Financial circumstances have the greatest impact on the SWB of the socially isolated who have the steepest gradient across the scale. When finding things very difficult, members of this class have a life satisfaction 0.9 points lower than the civic-minded but in conditions of living comfortably this gap closes to 0.3. Likewise the traditional close the gap slightly from 0.3 to 0.1 as they become more financially comfortable. The gradient of the slope of the socially isolated is similar to that of the civic-minded.

This is echoed in Figure 5.5 which uses the interactions with feeling better off and worse off where 'about the same' was the reference category. Again the predictions are made with household income held at the median value. The gap between the connectedness types is much larger in the presence of the stressor, but narrows when things are improving. The instrumental are shown to be less resilient here with life satisfaction below that of the integrated and civic-minded when experiencing a shock, but the same when the financial situation is steady. The same pattern is evident with the socially isolated who suffer more than the traditional when feeling worse off, but close the gap if matters are about the same. The

patterns conform to the description of the 'classic' protection factor which has a stronger effect in the presence of a stressor, compared to in less stressful times.

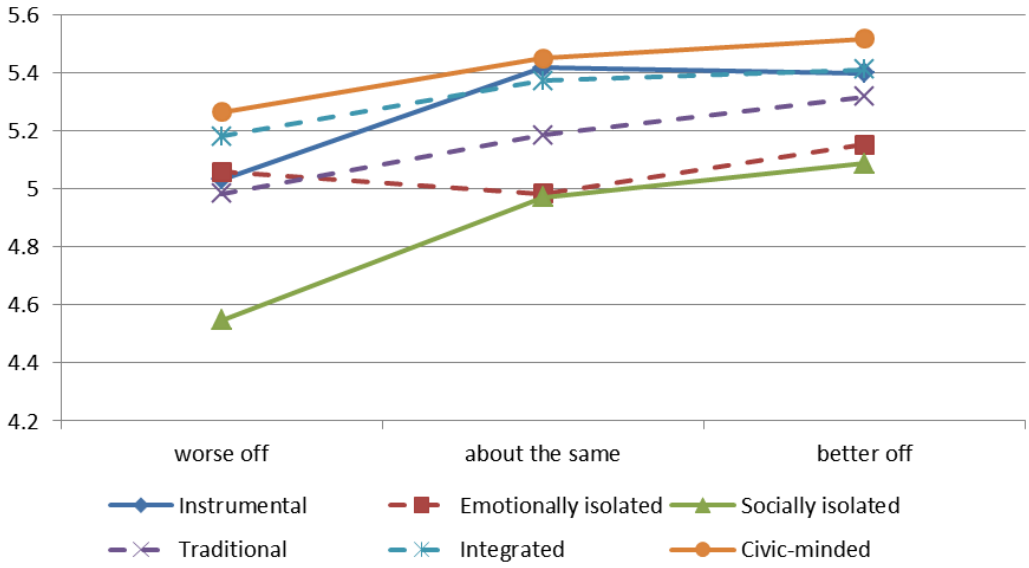


Figure 5.5 Plot of predicted values, based on Model 6A, of the different relationships by connectedness type between feeling worse or better off compared to last year and life satisfaction

5.12 Summary

This analysis focused on the subsample for which connectedness was non-changing and found that hypothesis 1 is supported: the gap in SWB between different types of connectedness is narrower when things are going well financially, and wider when things are not. Regarding the sub-hypotheses, $H_{1.1}$ is supported in that the interaction terms of all the non- civic-minded types were positive for the scale measures. This is statistically significant for all when low income observations are removed and holds for the distinction between the least and most connected in all models. For subjective financial situation, all interaction terms are also positive and statistically significant for the isolated compared to the civic-minded. $H_{1.2}$ is just partially supported, with the instrumental and socially isolated having significant negative interactions and therefore greater losses to their life satisfaction when feeling worse off than last year. Counter to the $H_{1.3}$, the emotionally isolated do not suffer more than the civic-minded when worse off. On household income, hypothesis 1.3 is supported, particularly when low income observations are removed from the model. The emotionally isolated has the interaction term of greatest magnitude, followed by the socially isolated. The difference in the income effect is smallest for the integrated while the instrumental and traditional have effect sizes in the middle of the range.

Household income was the clearest indicator of the protective factor effect particularly when low income observations are excluded from the model. The fact that the most objective of the three indicators is where the biggest differentials are seen, may suggest that connectedness is not only influencing perceptions of life satisfaction but also when appraising financial circumstances. This is explored in Chapter Seven. It was expected that the emotionally isolated would experience worse outcomes than the socially isolated due to the absence of social support; while this is true in the income models it is the socially isolated who experience the lowest levels of resilience by the subjective indicators.

The analysis tested for alternative mechanisms of effect. Firstly, the influence of habituation was explored. While this resulted in significant results in the overall model suggesting a hedonic treadmill effect at work, there were no differences in the effect of lagged income by connectedness. Secondly, because the lesser- and better-connected groups had different financial positions, the role of deprivation and need was explored by re-running models with the lowest 25% of incomes excluded. The results grew more, not less, robust, showing both that the results are not driven by the material needs of the isolated, and that the real effect may be underestimated due to measurement error. Further, there was no evidence that learning effects exerted any bias on the results, as year on year correlations of those present in the sample for all seven waves, do not increase over time. Finally, the results are unclouded by the fact that 2008 is a recession year in which a greater number found themselves worse off compared to previous years.

Chapter 6. Something about the network or something about the person? Changing connectedness and its effect on resilience

The last chapter showed that connectedness influences the relationship between personal economic circumstances and subjective well-being. This influence remains evident for the most and least connected, once a full range of socio-economic and psychological factors are controlled for, and once low income observations are removed, lesser distinctions in connectedness are also robust to the presence of controls. These conclusions were based on a subsample where connectedness is a stable non-changing resource. However, we know that connectedness is not non-changing but is a dynamic factor, with shifts from one pattern of connectedness to another occurring for over half the sample over four years. This chapter seeks to understand if, when changes in connectedness take place, resilience changes with it. The nature and causes of resilience are at the core of this inquiry.

It was noted in the early social support literature that the apparent effects of social relationships on well-being could be nothing more than spurious artefacts resulting from unmeasured underlying causes such as social skills and other competences (Thoits 1982). If we assume that connectedness is borne from stable psychological traits (such as extraversion, agreeableness, assertiveness), then it follows that the resilience demonstrated in the last chapter is dependent on those traits. Under such an assumption connectedness is not an *external* resource, but a manifestation of the *internal* resources that provide means and motivation for forming social ties.

However, though stable dispositional characteristics and connectedness may be highly correlated, the theoretical framework predicts that connectedness is separable from internal traits. The opportunities for threat appraisal, perceived control and self-worth that are theorised to stem from secondary as well as primary ties are not dependent upon stable traits but the social ties themselves. When the ties fall away the benefits will be lost. It is expected therefore that connectedness has the capacity to influence resilience independently of stable traits. In exploring this, the nature of resilience is made explicit; is it fixed or dynamic? Is connectedness an external or internal resource?

6.1 Hypotheses

Investigating the effects of changes in connectedness provides an instrument to answer these questions on the nature and causes of resilience. The advantage of panel data lies in the opportunity to observe change over time within individuals and the analytical strategy in this chapter is to match observed changes in connectedness to changes in resilience which then allows for inference on the mechanism of effect.

The main hypothesis to be tested in this chapter is as follows:

> H_2: Changes in connectedness will predict changes in subjective well-being and in resilience.

I generate specific hypotheses by considering 'types' of transition from one connectedness status to another with a focus on two main feaures of the transition. Firstly the 'direction' is made explicit where applicable because an expansion to the network is expected to be associated with increases to SWB and resilience, and decreases associated with a contraction. Secondly, I include transitions into the most and least connected of the classes, namely the civic-minded and the emotionally isolated as these 'extreme' types of connectedness are the most likely, given the theorised mechanism and empirical results in Chapter Five, to come with shifts in resilience.

> $H_{2.1}$: For those who transition into an civic-minded or other more-connected network type, money will have a reduced effect on life satisfaction, compared to before.

> $H_{2.2}$: Those who transition into emotionally isolation or other less-connected network type, money will have an increased effect on life satisfaction, compared to before.

The analysis is conducted in steps, seeking to understand along the way several sub- research questions which also serve the purpose of guiding the analysis and highlighting possible confounding explanations. Firstly, I will describe the typical patterns of changes in connectedness and explore the circumstances that coincide with change. Secondly, descriptive analysis will highlight how connectedness transitions are linked to subjective well-being. Finally, the dynamics of resilience are explored with due consideration given to the possible confounding effects of life events in addition to the controls used in previous chapters.

6.2 Latent transition model

The LCA model outlined in Chapter Four provides the basis for Latent Transition Analysis (LTA). The indicator variables are generated for both time points in the same way, and the same model constraints are imposed. Two latent variables are specified, one for each time point, and the number of classes for each is set at 6. Indicator means are constrained to be equal at both times under the assumption of measurement invariance. Table 6.1 shows that the proportion of the sample not active with organisations decreased from 51% to 48% between Time 1 and Time 2, while the proportion of those with zero or one friend from outside the household increased from around 9% to 12%. These changes are likely to reflect the increase in average age among panel members. The level of perceived support remained stable. By assuming measurement invariance, these differences will largely be realised as changes to the estimated class membership sizes, which is to say that a drop in the average number of friends will be realised as small increases to membership of classes 1, 2 and 3 rather than by a change in the *nature* of the classes. Ensuring the item response scores are equal in classes between time points therefore has the advantage that the substantive meaning of the classes is sure to stay the same making the latent probability matrix more readily interpretable, as well as helping with model identification (Collins and Lanza 2010). While information criteria are produced in the model output the highly constrained nature of the model means that they do not play a role in model selection, and are therefore not reported. The estimation method is maximum likelihood with robust standard errors which offers some protection against non-independence in the model.

	2003/4	2007/8
Number of organisations %		
0	51.0	47.6
1	30.6	36.8
2	13.6	10.9
3+	4.9	4.7
Number of friends %		
0	4.6	7.3
1	4.8	5.0
2	7.5	7.5
3+	83.1	80.2
Average social support		
	1.68	1.70

Table 6.1 Changes in distribution of indicator variables between Time 1 and Time 2

6.2.1 LTA results

The model solution produces classes as expected; there are small differences in the means of the indicator variables (see Table 6.2) compared to the single time latent class models in Chapter Four but this is not surprising given the model restrictions, and of little concern since the nature of the classes remains substantively unchanged (discussed in more detail below). The parameter estimates of particular interest here are the latent transition probabilities which are also shown in Table 6.2; class memberships at Time 1 are given in the table rows and the membership at Time 2 in columns. The scores express the probability of transitioning to a given latent class at Time 2 given the latent class at Time 1, thus each of the rows has a total of one.

Before describing the results in more detail it is important to consider the limitations to the possible conclusions that can be drawn from the LTA based on the research design (Collins and Lanza 2010). The two points of measurement in this analysis are four years apart and there is no way of knowing if further transitions occur between these two points. For example, the latent transition matrix shows that 2% of the civic-minded become socially isolated at Time 2, but the data do not reveal if that transition is direct or if a time is spent being traditional or integrated before the second point of measurement.[24] Empirical evidence is rather limited on the dynamics of social networks (Degenne and Lebeaux 2005) but it assumed here that transitions are unlikely to happen very rapidly with friendship, emotional support and connection to organisations taking time to establish. That said, the blunt nature of the measurement intervals means that volatility is likely to be underestimated and the transitions described here represent an absolute minimum of the level of change.

Some small shifts in latent class prevalences have occurred between the two time points. The largest shift is the drop in likelihood of membership in the traditional class from 44% to 41%. The civic-minded are reduced by 2 percentage points while the integrated grow by the same amount. The instrumental class increases in prevalence by 2 percentage points and the emotionally isolated by 1. The size of the socially isolated class has stayed constant at 7%. A comparison with the item response means from the latent class analysis at a single time point reveals that the classes have remained very similar in their nature. The average number of organisations by the new analysis is within 0.1 of the original estimates in each class, the largest difference in social support is 0.11 for the emotionally isolated. Regarding the number

[24] As acknowledged in Chapter 5, particular caution may be required in drawing conclusions on stability; those who appear to have consistent membership in a single latent class may also have experienced unobserved transitions out and back in again over the four years

of friends, both the isolated classes have decreased the mean by around 0.4. In conclusion, the nature of the classes in the latent transition analysis is substantively unchanged from the single time point analyses.

	latent status					
latent status prevalences	1	2	3	4	5	6
Occasion 1 (2003/4)	0.06	0.02	0.07	0.44	0.26	0.15
Occasion 2 (2007/8)	0.08	0.03	0.07	0.41	0.28	0.13
*Item response means**						
Friends	1.10	0.02	1.45	3	3	2.98
Social support	1.56	1.16	1.54	1.70	1.75	1.77
Organisations	1.29	0	0	0	1	2.30

Latent transition matrix

latent status at occasion 1	latent status at occasion 2					
	1	2	3	4	5	6
1	0.30 (.25 - .29)	0.05 (.01 - .22)	0.11 (.07 - .13)	0.16 (.13 - .15)	0.24 (.19 - .26)	0.14
2	0.13 (.07 - .13)	0.34 (.13 - .63)	0.18 (.13 - .19)	0.21 (.11 - .28)	0.11 (.06 - .16)	0.02
3	0.10 (.08 - .11)	0.10 (.02 - .30)	0.30 (.25- .30)	0.36 (.25 - .42)	0.12 (.08 - .14)	0.03
4	0.04 (.04 - .04)	0.03 (.01 - .13)	0.09 (.06 - .12)	0.54 (.48 - .55)	0.25 (.20 - .27)	0.04
5	0.08 (.07 - .08)	0.02 (.00 - .09)	0.04 (.02 - .06)	0.29 (.28 - .29)	0.44 (.40 - .45)	0.13
6	0.08 (.08 - .09)	0.00 (.00 - .00)	0.02 (.01 - .02)	0.13 (.12 - .14)	0.34 (.33 - .35)	0.43

* item response means are constrained to be equal in the model under the assumption of measurement invariance, thus the single set of parameters relates to both time points

Table 6.2 LTA model results with transition matrix showing class membership at Time 1 (rows) by class membership at Time 2 (columns); the shaded boxes on diagonal represent non-movers; rows add up to 1; 95% confidence intervals shown beneath; N = 16,117

The probabilities shown in the matrix confirm the transitional nature of connectedness. In total 60% of the sample belonged to a different latent class at Time 2 compared to their

starting position four years earlier[25]. The model includes cases with missing data at either time point (due to panel attrition and replacement) and relies on the probabilistic assignment of classes based on the prevalences alone where there is missing data on all indicators at a given wave. The resulting sample size for this model is larger than the models from a single time at 16,117. The statistical procedure provides standard errors along with multinomial logits for transitions with class 6 as the reference category; these are used to calculate confidence intervals which are in parentheses below the estimate in the matrix. Given the small class membership probabilities particularly of class 1 (8%) and class 2 (3%), and the 36 possible transition types (or rather 6 non-transitions and 30 transitions), some cell counts are low and thus incur wide confidence intervals. Despite the sparse nature of the data, general patterns are clear, and most transition probabilities for a given starting class are significantly different from each other allowing generalisable conclusions to be drawn.

The shaded squares on the diagonal show the probabilities, contingent on starting class, of remaining in the same class over a four-year period. The lowest percentages, which represent those where most movement out of a class is seen, occur in two of the isolated classes: just 30% of the instrumental and socially isolated and 34% of the emotionally isolated remain in those classes long term. The class with the highest percentage of non-changers is the traditional with 54% maintaining the same pattern of connectedness, while for the civic-minded and the integrated the Figure is just over 40% for each.

Now to explore each in more detail by starting point; members of class 1, the instrumental, are likely to transition out in all directions. Almost a quarter become integrated; these individuals maintain organisation-based social activity but increase the number of close friends and perceived support, as do the 14% who become civic-minded. A further 16% move into the latent status of traditional suggesting increases in informal connections but the organisations dropped. Combining these three transition types suggests that around 54% of instrumental increase their level of perceived social support and friendship ties over four years. This high proportion perhaps confirms the assumed role of organisation-based social activity as a means to forge new contacts and develop friendships. A further 11% become socially isolated and 3% become emotionally isolated, a change which sees organisation activity dropped. The confidence intervals for the transition to emotional isolation place this Figure at between 1 and 7% in the population which, while a wide margin, is significantly higher than the risk of becoming emotionally isolated for the most connected (i.e. the civic-minded).

[25] Calculation is not shown. This percentage differs to that shown in Table 4.15 due to the inclusion of individuals with missing data at either of the two times.

Of those who were emotionally isolated at Time 1, around a fifth move to the traditional class, 18% to social isolation, 13% to instrumental, 11% to integrated and just 2% to civic-minded. Similarly, the socially isolated most frequently become traditional, a change requiring the acquisition of close friends (36%). A smaller percentage, 24% in total, transition into a class involving organisational activity, a number slightly lower than the traditional or the emotionally isolated. A comparatively large 10% find themselves emotionally isolated. Regarding class 4, three quarters of the movements out of the traditional class are to classes 1, 5 and 6, so result from taking up organisations. 9% become socially isolated and 3% emotionally isolated experiencing a decrease in the number of close friends outside the household or a drop in social support, a percentage significantly higher than those who start as integrated or civic-minded.

The transitions out of classes 5 and 6 follow similar but not identical patterns. Of the civic-minded at Time 1, 85% are still involved in organisations after four years (43% remain, 34% become integrated, and 8% instrumental), compared to 65% of the integrated (44% remain, 13% become civic-minded, 8% instrumental), suggesting that the *level* of organisation activity might also be linked to the *permanence* of activity. Of the integrated who drop organisations, most become traditional (29% of the total), and a further 4% become socially isolated. The risk of emotional isolation is very low for both of these highly-connected classes with none of the civic-minded and just 2% of the integrated transitioning to class 2.

Two overarching conclusions about individual connectedness can be drawn. Firstly, that change in connectedness is common over a four year time span. It appears 'normal' to pick up and drop activity with organisations, as well as to experience changes in informal connections. As part of this pattern of fluidity, it appears that isolation is for most a temporary state; around two thirds are able to escape isolation within a period of four years. Although falling outside the reach of this thesis, there may be scope for further study here to examine how people make efforts to connect and how resources and social connectedness may be further interwoven. A lack of resources, for example, may mean that it takes longer or more difficult to find appropriate ties and the advice to 'find a club' assumes it is costless to do so which is unlikely to be the case. Secondly, those with both types of informal and formal ties in their networks are at much lower risk of becoming socially or emotionally isolated compared to the other classes. Their protection, therefore, may be twofold; that they experience better subjective well-being outcomes but are additionally highly unlikely to end up in a class where

resilience is lacking. This confirms, as others have found, that having multiple social roles provides protection from isolation (Kroll 2014).

6.3 Descriptive analysis: transition type and life satisfaction

6.3.1 Life satisfaction at Time 1

Figure 6.1 shows mean life satisfaction at the single time point 2004 by transition pattern. The x-axis shows all the transition types, the first digit representing connectedness at the earlier point, and the second the later. The transitions made up of a pair of repeated digits (11, 22, 33, etc.) represent those who retained the same latent status in both measurement occasions and for whom I assume stability.

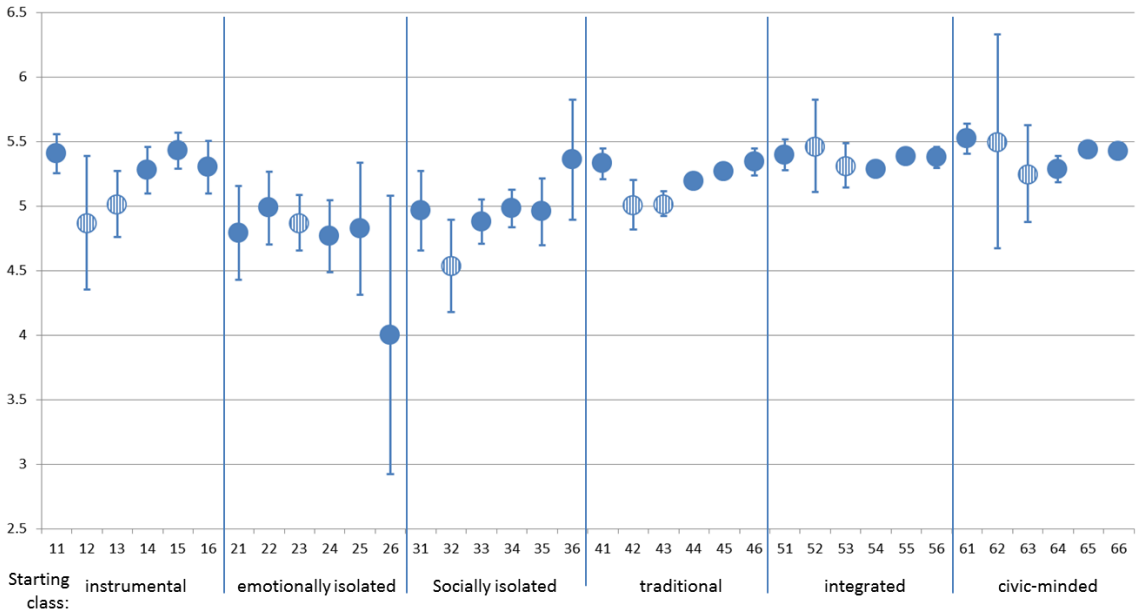


Figure 6.1 Average life satisfaction in 2004 by connectedness transition type; the bars show 95% confidence intervals around the mean; striped markers are those in emotional isolation at Time 2

An important aspect of the relationship between happiness and connectedness over time is highlighted here, namely that life satisfaction pre-transition seems to have predictive power, or in other words, reveal a predisposition to changes in connectedness. It is evident, for example, that those who become either emotionally or socially isolated at Time 2 (highlighted with striped markers) already had lower satisfaction before the transition took place. Those in the instrumental class who go on to transition into class 2 or 3 have life satisfaction around a half point lower than those that stay or who increase their network size, and a similar pattern is apparent for the traditional, and for those who go from social isolation to emotional

isolation. On the other hand, the integrated and civic-minded who transition into isolation appear to have the same level of satisfaction as other members of the class at Time 1, although the small numbers experiencing this type of transition means that confidence intervals are wide. There is also a pattern whereby those who go on to become more connected have higher life satisfaction pre-transition. This is evident for those who move from social isolation into civic-mindedness and traditional who move to classes 1, 5 or 6.

Existing attributes, then, can seemingly drive future patterns of social ties. These may be of psychological origin such as personality, related to life circumstances including health, or to transitions such as moving house or getting divorced. This point has implications for the conclusions which may be drawn on the power of connectedness to change happiness. It is evidently necessary to control for initial levels of happiness, which in itself may be an advantage for forming new social ties (Diener and Biswas-Diener 2008), or else may reveal the existence of hidden factors such as extraversion and sociability. These factors may explain both why emotional isolation is only of brief duration, as well as being resilience resources in themselves (Bolger 1990; Pallant and Lae 2002; Skodol 2010).

6.3.2 Life satisfaction changes

The next graph (Figure 6.2) instead plots average *change* in life satisfaction against each of the 36 transition types. The change is calculated by deducting satisfaction in 2004 from satisfaction at in 2008; a positive score thus indicates that an increase in subjective well-being has occurred in the four years, a negative score a decrease. A striking point is the lack of change in satisfaction among the non-changers of all starting classes except the instrumental. Thus on average across types, non-changing connectedness is generally associated with non-changing subjective well-being (non-changers are highlighted with patterned markers).

The instrumental are the type which do not fit with this generalisation; their life satisfaction drops by 0.2 during the four-year period during which they maintain stable patterns of social ties. One possible interpretation of this could be that individuals belonging to this latent class hold aspirations to expand their personal networks and that the step for those with limited friendship ties of taking up an activity with a group is in the hope of acquiring new fulfilling relationships. This socially-aspirational nature is perhaps further evidenced by the high incidence of increasing informal ties highlighted in the LTA model. Happiness may be linked to this class to the extent it is used as a stepping stone to new connections. Exploring further those who started out as instrumental shows that patterns of change to life satisfaction are not entirely predictable. Those becoming emotionally isolated experience an average drop of

0.6 in satisfaction. This change is as we would expect having established the emotionally isolated least happy of the types. Because we are plotting change in life satisfaction this drop is *in addition* to the pre-existing lower happiness shown in Figure 6.1. Likewise, in terms of meeting expectations based on patterns evidenced in the previous chapter, those who transition to the status of civic-minded experience an increase in satisfaction of around 0.1 points. On the other hand, however, those who become traditional, resulting from a drop in organisation-based activity but an increase in informal networks, drop in happiness, although because their starting satisfaction was better this does not mean equivalence in raw satisfaction scores.

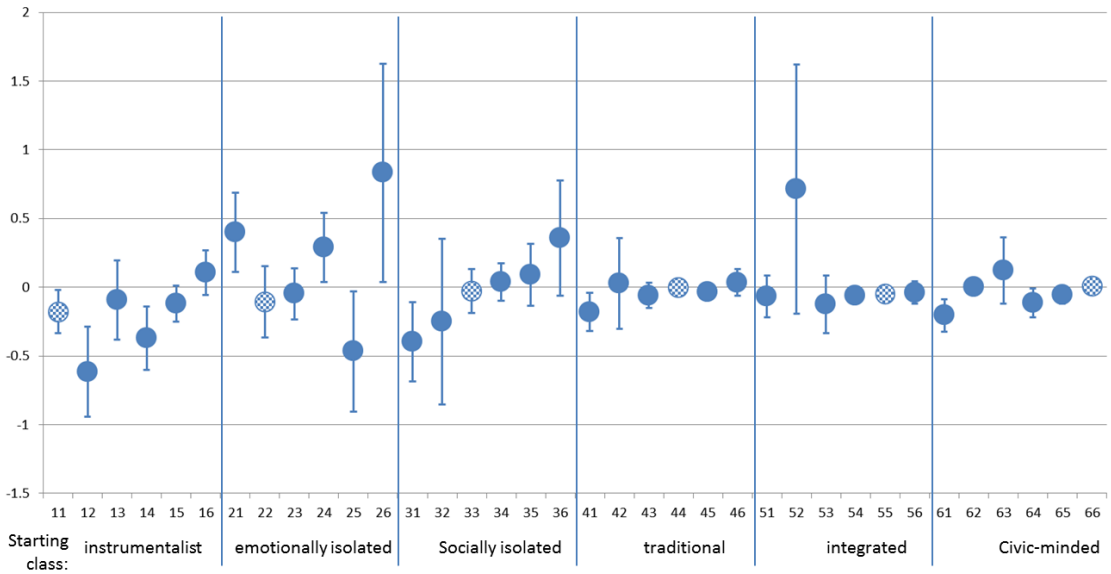


Figure 6.2 Average change in life satisfaction between 2004 and 2008 by transition type; bars represent 95% confidence intervals

Of the emotionally isolated at Time 1, those who stay or become socially isolated experience no change in life satisfaction. Those who go on to become civic-minded experience a large boost of 0.8. This is a substantial change, although being a small group, the confidence intervals are rather wide (0.04 – 1.6). However, their low starting point is noteworthy (fig 6.1) and perhaps suggests that emotional isolation was a particularly tough experience for this subgroup. The small number involved in this transition type (n = 11) means there is wide confidence intervals around the estimate. Those becoming instrumental or traditional also gain in satisfaction. Conversely, and counter to expectations, a transition to integration brings about a reduction in life satisfaction. For the socially isolated, a significant drop in satisfaction occurs among those who become instrumental, but no change is evident among other

transition patterns. The traditional echo this pattern exactly, with a significant shift seen only for those transitioning to class 1. Those who start out as integrated show no significant change by transition and the civic-minded experience a reduction when becoming instrumental or traditional.

Overall, the examination of change scores suggest that real change in life satisfaction does occur in response to connectedness changes over and above existing tendencies, though it is often small in magnitude and not always in the expected direction. Transitions into and out of the most and least connected statuses seem to have predictable and consistent effects on satisfaction while some specific transition patterns, such as emotional isolation to integration, are harder to explain.

6.4 Types of transition

The descriptive analysis has highlighted that certain transitions are associated with subjective well-being more than others, and further that the effect of a transition is contingent upon the starting type. The strategy to analyse the effect on resilience includes a specific focus on transition type, along with the transition into the other 'extreme' state of connectedness of emotional isolation. Dummy variables are created for these. In addition to these exact transition patterns, several other dummy variables are created to capture the range of possibilities in a broad manner. 'Non-changing' includes all those of any starting class who did not transition; 'other less' includes all those, aside from 'transitions to class 2', who move to a less connected state, while 'other more' captures increases other than 'transitions to class 6'. *Less* and *more* treat equally the type of tie so that, for example, one who drops a friend but picks up an organisation is neither more nor less, but is coded as 'transition to different', a category representing sideways moves of a qualitative rather than quantitative nature. The coding of transition types is summarised in Figure 6.3 based on the transition matrix. The subsample size for each possibility is shown beneath and aggregates in Table 6.3. The starting classes of each are kept in mind for the interpretation of results; transitions to class 2 can be from any class other than class 2, likewise for transitions to 6. Transitions to less on the other hand originate from the well-connected classes, 4, 5 and 6. Transitions to different are from more varied starting positions (1, 3 and 4).

latent status at occasion 1	latent status at occasion 2					
	1	2	3	4	5	6
1	non 203	transto2 31	different 74	different 104	more 151	transto6 90
2	more 63	non 108	more 134	more 126	more 46	transto6 11
3	different 54	transto2 28	non 147	more 192	more 67	transto6 14
4	different 232	transto2 115	less 443	non 2,452	more 1,163	transto6 242
5	less 240	transto2 44	less 105	less 826	non 1,214	transto6 382
6	less 163	transto2 4	less 33	less 247	less 617	non 826

Figure 6.3 Transition types by transition possibilities; N shown beneath is based on cases with non-missing data at both times

Transition type:	n
Non-changing	4,950
Trans to 2 (emotional isolation)	222
Trans to 6 (civic-minded)	739
Other more	1,942
Other less	2,674
Different	464
	10,991

Table 6.3 Totals of transition type; total n is individuals present at both Time 1 and Time 2

The reduction of the range of transition trajectories into these six broader types mainly serves the purpose of data reduction, that is, to add capacity in terms of statistical power, there being insufficient observations within each of the 36 possibilities. There is no doubt that here, as in other reductionist methods, some detail about the specific effects of particular trajectories will remain unexplored. However, this approach is not damaging to the purpose here. Firstly, the research question is concerned with the possibility of shifts in resilience; it is not necessary to demonstrate shifts along different pathways, but rather to establish if changes exist. The most obvious place to start to look is transitions into the most and least connected statuses.

Average life satisfaction by year and transition type is shown in Figure 6.4. It can be seen that those who transition into civic-minded have on average very stable life satisfaction and have on average score of between 5.3 and 5.4 in all seven years. A downward slope can be noted, on the other hand, for those who end up emotionally isolated in 2008, their satisfaction dropping from around 5 to just below 4.8. A move to a 'different' class is similarly associated with an overall downward trend in life satisfaction. Transitions of the types 'other more' and 'other less', as well as the non-changers, follow a similar trajectory to the overall average, although the 'other more' has a lower starting level.

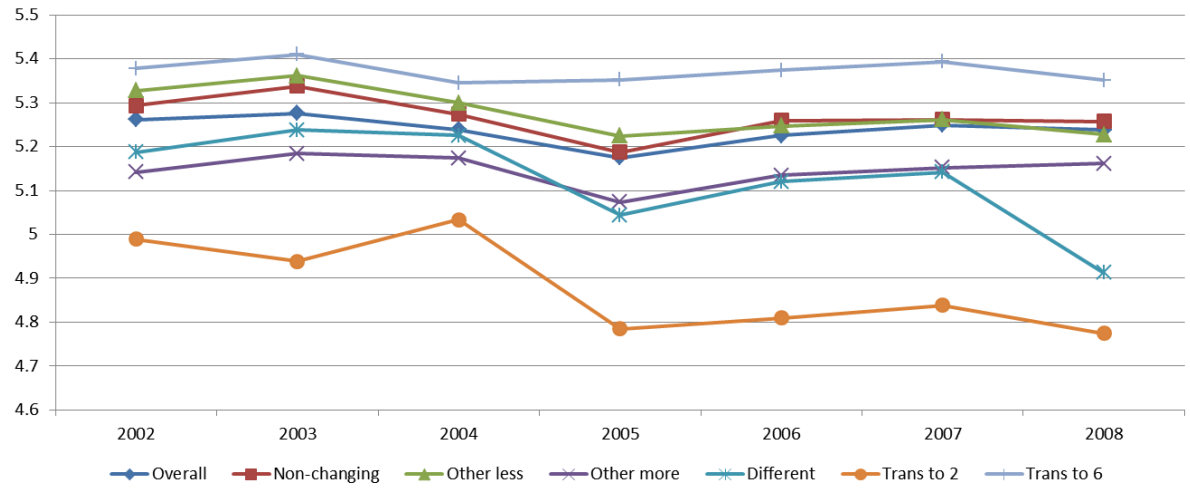


Figure 6.4 Trajectories of life satisfaction by transition type

6.5 Predictors for transitions

This section includes descriptive analysis to determine socio-economic and personality factors that are associated with transitions in connectedness. Its purpose is to identify possible confounders of changes in SWB and resilience that will receive attention later in the chapter. Marital status and job status are correlates of connectedness (as shown in section 4.4.2), and Table 6.4 shows the bivariate relationship between changes that occurred in marital and job status and changes that occurred in connectedness in the same period. The patterns of transition among those who have experienced any change in marital status between 2004 and 2008 largely echoes the patterns of the total sample, suggesting that it is not a key factor in driving patterns of transition in connectedness. We can see, for example, that of those with a new marital status in 2008 43% are non-changers, 5% transition to a different but quantitatively equivalent status, 24% move to a lesser connected type and 6% civic-minded. The rate of occurrence of these transition types is the same as for the total sample. There are, however, some small differences; those who have experienced a relationship change have a

slightly higher rate of becoming more connected (19% compared to 18% overall) and a slightly higher level of becoming emotionally isolated (3% compared to 2%). The particular type of relationship change similarly reveals that the effects on connectedness transition are minimal with difference never ranging above 5% in terms of difference to the overall sample, and usually well within. Some variations from average are that those who were widowed in the four-year period who are less likely than average to increase their network (13% compared to 18%) and more likely to transition to different (by 3 percentage points) and to emotional isolation (by 2 percentage points) compared to average.

In terms of changes to job status; any change seems to bring about a small reduction in a transition to less connectedness, but a small increase in transition to emotional isolation. Other differences to the average are minimal. The type of job status change provides more detail, and some more discernible patterns; the newly retired, for example, are slightly more likely than average to become civic-minded (8% compared to average of 7%). Less than average of those who have become ill (long term ill as their job status) move to a less well-connected status (19% compared to 26% overall). Although this seems to be counter-evidence to the established pattern that the unwell are more likely to become isolated, this group may depend on their personal networks to a larger extent and invest more in maintaining social ties, and may also perceive social support differently. Those becoming long term ill, however, do, on the other hand, also become emotionally isolated (7%) more than average (3%). Being newly employed is associated with a lower rate of transitioning to less connectedness (22% compared to 24%) and a higher rate of more (21% compared to 18%). For those becoming unemployed their patterns of transition are very similar to average with the exception of becoming civic-minded where just 3% of the newly unemployed transition to compared to 7% on average. Overall, there is evidence that work provides opportunities for connectedness, although the small percentages involved suggest that it is not the main driver of change in network.

Also included in Table 6.4 are the means of the big five personality trait scores. Many of the mean scores by transition are statistically different from the overall mean; however, the differences are substantively small. For example, those who transition to emotional isolation are less agreeable than those becoming civic-minded but the difference between them is 0.6 on a 27-point scale. Some of the bigger differences are seen in extraversion, such as those transitioning to civic-minded where the mean score of 13.8 compared to 12.2 for those falling into emotional isolation. A difference of similar magnitude is seen in openness. It seems that

extraversion, openness, agreeableness and conscientiousness can facilitate the forging of new ties, while neuroticism is associated with losing them. Therefore, despite the fact that connectedness is conceptualised as an external resource, internal resources such as personality traits may play a role in facilitating network changes.

	Connectedness transition type						
	non-changing	Less	more	diff	transto 2	transto 6	n
All	45%	24%	18%	4%	2%	7%	10,991
Change in marital status							
Any change	43%	24%	19%	5%	3%	6%	1,084
Split	44%	24%	19%	6%	2%	6%	245
New relationship	42%	23%	21%	5%	3%	7%	643
Widowed	43%	27%	13%	7%	5%	6%	392
Change in job status							
Any change	44%	22%	18%	5%	4%	7%	2,041
Newly unemployed	45%	25%	17%	6%	5%	3%	195
Newly retired	45%	22%	16%	6%	3%	8%	691
Newly long-term ill	46%	19%	17%	7%	7%	4%	204
Newly employed	43%	22%	21%	4%	3%	7%	595
Personality							mean
Agreeableness	16.4	16.3	16.4	16.4	**16.0**	**16.6**	16.3
Conscientiousness	**15.9**	**15.9**	**16.1**	**15.6**	**15.6**	**16.1**	15.8
Extraversion	**13.3**	13.4	13.4	**13.1**	**12.2**	**13.8**	13.5
Neuroticism	**10.9**	**10.8**	**11.2**	**11.4**	**11.9**	**10.8**	11.0
Openness	13.2	13.3	13.3	**12.7**	**12.4**	**14.0**	13.3
Change in financial stressors							mean
Change in income	-3.8	13.0	57.8	-27.4	66.2	21.0	13.2
Change in financial situation	-0.14	-0.12	-0.10	-0.19	-0.11	-0.15	-0.13
Change in worse off	18%	17%	17%	15%	10%	20%	17%

Table 6.4 Mean event occurrence by connectedness transition type; changes for connectedness, marital status and job status occur between Time 1 and Time 2; means of personality scores and financial stressors are shown, those significantly different to sample mean are in bold

Finally, the average change in the indicators of financial stressors is shown by transition type. The change is calculated by deducting the 2004 value from the 2008 for each individual. Household income is shown in real equivalised pounds (not logged). Change is calculated based on real income, that is, income deflated to 2002 pounds and the level of change is

modest, just £13.2 for the whole sample. The largest increases to household income are seen among those transitioning to more, and those transitioning to emotional isolation; however, these are still of modest size and are not significantly different from the mean. Self-rated financial situation exhibits an overall drop between 2004 and 2008 of 0.13 (on a five-point scale); a transition to different seems associated with a slightly larger drop of 0.19 but again this is not significantly different from the mean. Finally, change in the rate of declaring personal finances to be worse than the previous year has grown by a substantial 17% showing perhaps that the uncertainties generated by the financial recession were being felt by individuals in fairly large numbers. Those falling into emotional isolation experience the lowest rate of feeling worse off although as with the other financial indicators, the level of experiencing feeling worse off are not, for any transition type, significantly different to the average.

6.6 Testing for change: Multiple group models

This section sets out to determine whether changes in connectedness are associated with changes in resilience and in doing so ascertain whether the nature of the resilience resource can be understood as external as well as internal. Therefore this analysis seeks to establish connectedness as a resilience resource which is conceptually and empirically separable from the stable character traits which are known sources of resilience, coping, happiness and sociability. In order to demonstrate this it is necessary to analytically separate connectedness from the individual, in other words to look for changes in resilience within the *same* individuals at *different* points in time.

To achieve this, linear regression models are used with life satisfaction as the dependent variable at the two time points at which connectedness is measured. A binary year indicator is used as a grouping variable in the method of analysis known as multiple group modelling, a statistical procedure used to establish equivalence or difference of parameters among different groups of people, or, as here, the same people at different times.

An illustration of the conceptual model is shown in Figure 6.5. Each of the arrows represents a relationship being modelled between the outcome variable and covariates. In this basic model (realised with data in Model 1A, Table 6.5) both of the outcomes, that is, life satisfaction in 2004 and life satisfaction in 2008, have three covariates. The first, financial circumstances, is treated as time-varying; in other words, the relationships of interest are between the financial circumstances in 2004 and SWB in 2004 (arrow 1) and in a separate sub-model, the circumstances in 2008 and SWB in 2008 (arrow 2).

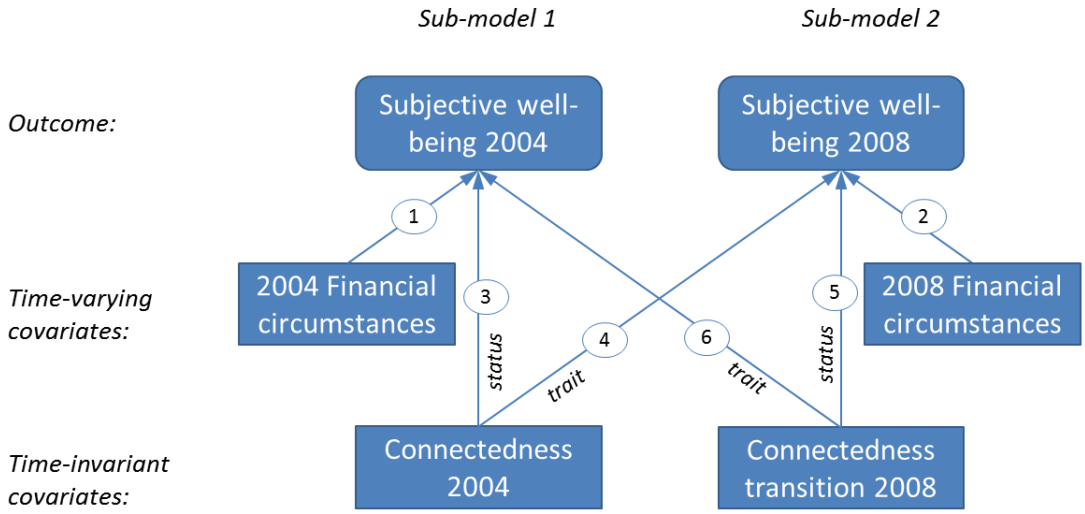


Figure 6.5 Conceptual model – multiple group model where Sub-model 1 is 2004 and Sub-model 2 is 2008

The pathways between connectedness and SWB are more complex in terms of their potential effects at the two different times. These variables are fixed by design, connectedness in 2004 is set as the starting class and connectedness in 2008 is set as one the five transition types described above for each individual with non-missing indicators at both time points. Despite the time-varying nature of connectedness, then, these variables are time-invariant, and are included as covariates in both sub-models, where they retain the same value for each case included in the model. The substantive interpretations of the effect of connectedness on the outcome are considered somewhat differently in the two groups. For example, arrow 3, which shows the relationship between connectedness in 2004 and satisfaction in 2004, has the relatively simple reading as being the effect of personal network status at that time on SWB at the same point in time. In contrast, the effect of the connectedness transition 2008 on life satisfaction in 2004 (arrow 6) cannot be understood as a result of a *status* attribute of the individual but rather may result from an underlying *trait* or *tendency* of that individual. Connectedness depends upon social structures and circumstances, and therefore despite a stable personality trait, an individual may be unable to have the network desired at a particular time due to time, economic, or geographical constraints, which are subject to change.

Values and personality attributes are two likely aspects of these traits or tendencies. Take, as an example for illustrative purposes, two individuals in emotional isolation in 2004: person A is generally agreeable, sociable and outgoing but happens to be experiencing relationship

problems at the time of observation, whereas person B has higher than average levels of neuroticism, low extraversion, and generally struggles to maintain good relationships. It would not be a surprise if person A is the one who, in 2008, has left isolation behind and acquired a more fulfilling network while person B remains isolated. Similarly, a leaning towards social or community values may explain a tendency to take up activity with organisations. Those with no organisational activities in 2004, for example, may have been constrained through financial resources or long working hours, but if and when opportunities arise will take up such activity because of their values and interests. In both of these hypothetical examples "connectedness transition in 2008" serves as a result or manifestation of underlying traits that existed within the individual in 2004. In the first example, the explanatory traits were those of personality which have a strong and direct effect on subjective well-being (Costa et al. 1987; Argyle and Lu 1990a), and in the second, pro-social values which are associated with subjective well-being (Kasser and Ryan 1993) as well as being able to explain the transition itself.

In the 2008 sub-model, on the other hand, connectedness transition represents a current status, while it is the starting connectedness that serves as an indicator of underlying traits of the individual. In both sub-models the presence of starting connectedness serves as an essential control because it is somewhat confounded with transition type (see Figure 6.3). The difference between the coefficient estimates in the two groups, for example, comparing arrow 3 with arrow 4, and arrow 5 with arrow 6, provides information on the extent to which the effect of connectedness is most apparent as a *status* which is to say, due to benefits from social relationships (such as belonging, support, feeling of self-worth etc.) being concurrent with the presence of (the right kind of) social ties. Estimates which look the same across sub-models, in contrast, would invoke explanations based on features of personality, values or other stable attributes of the individual or situation. Resilience levels, which are demonstrated through interactions between financial stress and connectedness, are not shown in this conceptual representation of the models in Figure 6.5, but are subject to the status or trait interpretation remains as described.

In summary, this modelling approach means that change within the individual can be explicitly explored by comparison of the effect of connectedness, directly and its interaction terms, in the two times. The model parameters are estimated for each sub-model defined by the grouping variable; '2004' and '2008'. The primary aim is to model the effects of transition before and after it has occurred; a significant result in the 2004 model would indicate, as I have described above and seen in the bivariate analysis, that individuals may be predisposed to

certain changes in connectedness, and that these predispositions are at the root of the observed patterns of subjective well-being and connectedness. On the other hand, if effects of transition are not apparent in the 2004 estimates but are so in 2008 it implies not a stable disposition-based aetiology but rather that a change in circumstances, such as a change in connectedness as hypothesised here, has a causal effect on levels of resilience.

The analysis is restricted to cases where connectedness from both times is known so that those leaving or entering the panel between these years are dropped, as are those with missing values on all the connectedness indicators at either time. As described in Chapter Three, evidence for change comes from two sources: the coefficient estimate and its standard errors and the Wald test which is applied on specific pairs or sets of coefficients to provide further statistical evidence for change as described in Chapter Three.

6.6.1 Changing connectedness: changing happiness?

In Model 1, shown in Table 6.5, the five dummy transition types (transition to civic minded; transition to emotional isolation; transition to other more; transition to other less; and transition to different; with the reference category being no change) as well as initial connectedness type and household income are regressed on life satisfaction. Where changes in the coefficient estimates in the two sub-models provide weak evidence for change, the parameters subjected to the Wald test for more robust evidence. Wald tests are done one parameter at a time, numbered next to the variable name and reported beneath.

The effect of starting class, the pattern of connectedness in 2004, has a very similar effect on satisfaction in 2004 and 2008 suggesting that underlying happiness or sociability traits may play a large role. There are some shifts in coefficient estimates, however, for example the satisfaction deficit of the emotionally isolated drops from 0.61 in 2004 to 0.43 in 2008, and from 0.52 to 0.44 for the socially isolated. These small shifts in effect size probably result from the 'distance' of four years from the point of measurement during which many members will have undergone a transition in connectedness. These variables serve mainly a control purpose here and are not subjected here to extensive review or difference testing, and we now examine the effects of transition type.

The life satisfaction of those who transition into a civic-minded network is not statistically different to the reference category of 'no change' in 2004. In 2008 the coefficient increases slightly to 0.08 which is borderline significant. Thus there is both a lack of evidence for any substantial difference compared to the non-changers, and for change over time for this group. Although at first glance this may seem incongruent with the results of the descriptives (Figure

6.2), it can be explained by the fact that Model 1 takes into account the starting point of connectedness and captures the average effect of the transition, not the trajectory specific means. Those who become emotionally isolated appear to become less happy after the transition (b = -0.37) compared to before (b = -0.16), though this is not a significant change according to Wald test 2. A transition to a different type of network, such as a shift that is neither more nor less seems to be associated with the greatest change between the two times. Pre-transition they are not significantly (or substantively) different to the non-changers but afterwards have a satisfaction score 0.26 lower. The Wald tests on the before and after transition parameter estimates suggest that life satisfaction after a transition to 'different' network type is a true difference, that is, when constrained to be equal the model is significantly harmed. The other transition types are not associated with a change in life satisfaction according to the Wald test.

Finally, the model also includes household income. The coefficient of 0.07 rising to 0.13 in 2008 is a statistically significant increase with a p-value of 0.02 on the Wald test. This shows that income becomes more important for happiness as years go by, reflecting the shift in aspirations as pay-increases are assimilated (Easterlin 2003; Di Tella et al. 2010). It highlights that household income has a non-linear effect over time. The R-squares of the model are modest with around 2% of the variance in life satisfaction being explained by the connectedness and income independent variables, although this is not untypical in models of subjective well-being without other subjective indicators (E.g. Burt 1987; Blanchflower and Oswald 2004; Li 2007; Headey et al. 2010).

	1A: Main effects of changing connectedness				1B: With prior happiness			
	2004		2008		2004		2008	
	b	**SE**	**b**	**SE**	**b**	**SE**	**b**	**SE**
Household income[1]	**0.07**	**0.02**	**0.13**	**0.02**	**0.05**	**0.01**	**0.11**	**0.01**
Starting class (ref cat is civic-minded)								
Instrumental	**-0.15**	**0.06**	**-0.17**	**0.07**	-0.05	0.05	-0.08	0.06
Emotionally isolated	**-0.61**	**0.08**	**-0.43**	**0.08**	**-0.26**	**0.07**	**-0.18**	**0.07**
Socially isolated	**-0.52**	**0.07**	**-0.44**	**0.07**	**-0.23**	**0.05**	**-0.21**	**0.06**
Traditional	**-0.24**	**0.04**	**-0.22**	**0.04**	**-0.07**	**0.03**	**-0.08**	**0.03**
Integrated	*-0.07*	*0.04*	**-0.09**	**0.04**	0.02	0.03	-0.02	0.03
Transition into… (destination class)								
Civic-minded	0.05	0.05	*0.08*	*0.05*	0.00	0.04	0.04	0.04
Emotional isolation[2]	*-0.16*	*0.09*	**-0.37**	**0.15**	0.05	0.07	**-0.15**	**0.13**
Other less[3]	**-0.07**	**0.03**	**-0.11**	**0.03**	-0.03	0.03	**-0.07**	**0.03**
Other more	*0.06*	*0.04*	0.04	0.04	0.05	0.03	0.04	0.03
Different[4]	0.04	0.07	**-0.26**	**0.07**	0.04	0.05	**-0.22**	**0.06**
lifesat 2002					**0.59**	**0.01**	**0.49**	**0.01**
Constant	**5.44**	**0.03**	**5.41**	**0.03**	**2.17**	**0.05**	**2.70**	**0.06**
Model fit/test statistics								
R-squared	0.02		0.02		0.36		0.27	
Wald test[1] (1 df)	5.76	p = 0.02			9.34	p = 0.00		
Wald test[2] (1 df)	1.53	p = 0.22			1.86	p = 0.17		
Wald test[3] (1 df)	0.83	p = 0.36			1.14	p = 0.29		
Wald test[4] (1 df)	9.89	p < 0.01			10.07	p = 0.00		

Table 6.5 Multiple group linear regression model; grouping is 2004 compared to 2008

Model 1B includes life satisfaction from 2002 as a control intended to rule out dispositional happiness as a cause of the observed relationships. We can see that the effects of starting connectedness are reduced, as are the (weak) effects of transitioning to civic-minded and other more connected classes. Transitioning to emotional isolation or 'other less' on the other hand has a negative effect even when controlling for prior satisfaction, although as in Model 1A, the coefficients are not statistically different according to the Wald test in the two years. The negative influence of a transition to a different type of network continues to be significant. In short, the addition of lagged life satisfaction does not substantially change the results of Model 1A: once income and starting connectedness are controlled for there seems to be no change to life satisfaction after a transition to emotional isolation, civic-minded, other more or other less network types. This is consistent with the interpretation that much of the connectedness effect on SWB is brought about through dispositional factors. However, as I go on to show, once fully accounting for the effect of income for each transition type, changes associated with the state are evident over and above those associated with the trait.The

exception is a transition to a different network type which brings about a reduction in life satisfaction after, but not before the transition.

6.6.2 Changing connectedness: changing resilience? Protective factor models

The 'protective factor' models, as in Chapter Five, are characterised by the inclusion of interaction terms which show the differential effect of the stressor by connectedness transition. The protective factor models in the previous chapter showed that the degree to which money influences happiness is contingent upon connectedness (when connectedness is non-changing). The same approach is now extended to transition types. The three indicators of personal and household financial situation are interacted with transition type in three sets of models to which controls are added. The first, models 2A - D (tables 6.6 and 6.7) tests the effect of household income on life satisfaction by transition type, the omitted category for which is 'no change'. The same interactions are included in both parts of the multiple group model. Exactly the same cases (N = 10,991) are used in both sub-models. The interactions capture the average effect of income on the satisfaction of the same individuals before and after they make the transition, thus evidence for *difference* between the two groups, is evidence for *change* in resilience.

In Model 2A, there are differences between the coefficient estimates of the transition interactions in the two parts. The effect of income on the satisfaction of those becoming civic-minded goes from being not significantly different to the non-changers in 2004 to a significant -0.13 in 2008, which, in terms of coefficient size, cancels out completely the main effect of income. It therefore appears that only after the transition does the resilience come into force, suggesting that connectedness itself and not stable traits are responsible for the observed effect. The Wald test on constraining this single parameter to be equal in both years produces a value of 3.81 which has a significance level marginally above the conventional cut-off at of p = 0.055. This provides some evidence that money becomes a less important factor in the life satisfaction of this group of individuals compared to their previous selves pre-transition. The significance drops though the 'change' in coefficient size holds once prior life satisfaction is controlled in Model 2B.

	2A: Transition- income interactions					2B: with prior satisfaction			
		2004		2008		2004		2008	
		b	SE	b	SE	b	SE	b	SE
Starting class (ref cat is civic-minded)	Household income	0.03	0.02	**0.13**	**0.02**	0.02	0.02	**0.10**	**0.02**
	Instrumental	**-0.16**	**0.06**	**-0.17**	**0.07**	-0.05	0.05	-0.08	0.06
	Emotionally isolated	**-0.60**	**0.08**	**-0.42**	**0.08**	**-0.25**	**0.07**	**-0.18**	**0.07**
	Socially isolated	**-0.52**	**0.07**	**-0.44**	**0.07**	**-0.23**	**0.05**	**-0.21**	**0.06**
	Traditional	**-0.24**	**0.04**	**-0.22**	**0.04**	**-0.07**	**0.03**	**-0.08**	**0.03**
	Integrated	*-0.07*	*0.04*	**-0.09**	**0.04**	0.02	0.03	-0.02	0.03
Transition into… (destination class)	Civic-minded	*0.05*	*0.05*	*0.09*	*0.05*	0.00	0.04	0.05	0.04
	Emotional isolation	-0.13	0.10	**-0.38**	**0.16**	0.12	0.08	-0.12	0.14
	Other less	**-0.07**	**0.03**	**-0.11**	**0.03**	-0.03	0.03	**-0.07**	**0.03**
	Other more	*0.07*	*0.04*	0.04	0.04	*0.05*	*0.03*	0.04	0.03
	Different	0.06	0.07	**-0.21**	**0.07**	0.04	0.06	**-0.18**	**0.06**
Transitions * household income	Trans to civic * inc[1]	0.05	0.07	**-0.13**	**0.07**	0.01	0.06	**-0.11**	**0.06**
	Trans to emot-isol *inc[2]	0.14	0.12	-0.04	0.27	**0.24**	**0.10**	0.12	0.23
	Other more * inc[3]	**0.11**	**0.05**	0.02	0.04	0.05	0.04	0.01	0.04
	Other less * inc	0.06	0.04	-0.01	0.04	0.05	0.03	0.02	0.04
	Different trans * inc[4]	*0.15*	*0.08*	**0.25**	**0.10**	0.05	0.07	**0.21**	**0.09**
	lifesat 2002					**0.59**	**0.01**	**0.49**	**0.01**
	Constant	**5.44**	**0.03**	**5.41**	**0.03**	**2.16**	**0.05**	**2.70**	**0.06**
	Model fit/test statistics								
	R-squared	0.02		0.02		0.37		0.27	
	Wald test[1] (1 df)	3.56		P = 0.06		2.36		P = 0.12	
	Wald test[2] (1 df)	0.35		p = 0.55		0.22		p = 0.64	
	Wald test[3] (1 df)	2.04		p = 0.15		0.61		p = 0.44	
	Wald test[4] (1 df)	0.70		P = 0.40		2.13		p = 0.14	

Table 6.6 Multiple group linear regression model; grouping is 2004 compared to 2008

The effect of income on satisfaction for those moving into emotional isolation tells a different story in terms of the direction of change. In 2004 the coefficient of the interaction is a non-significant .14 in Model 2A though in Model 2B is larger (b = 0.24) and significantly different to the main effect. This above-average dependency on household income for subjective well-being actually precedes the transition, indicating that emotional isolation does not cause a lack of resilience per se. but may instead imply a common cause. Early life experiences, for example, may play a role with the prioritisation of financial success over pro-social goals more common among young adults with less nurturant parents (Kasser et al. 1995), while those who emphasise financial success on entering college go on to report lower satisfaction with friendships (Nickerson et al. 2003). What is interesting, yet perhaps harder to explain, is that the dependency on income seems to disappear in 2008 once the transition has occurred, a fact that seems to contradict the effect shown for the non-changing emotionally isolated. Two explanations are plausible; firstly that the change in the income-satisfaction relationship is a

statistical artefact, and not generalisable to the population; indeed the Wald test yields a non-significant p-value in both models. However, as controls are added, as will be described in more detail, the p-value seems to hover at borderline significance suggesting that a real change is captured by the data but that statistical power is lacking. Therefore, and secondly, the change may be real, which is to say that money does become less important once a person has found themselves emotionally isolated than before the connectedness change occurred. In this case additional analysis may be required to unravel the effects for those currently in, transitioning into, and transitioning out of isolation over time. The resilience patterns of those dipping in and out of isolation may be different to the long-term isolated. The low frequency of occurrence puts such an investigation out of scope for this analysis; but this may be a fruitful area of research for future projects.

The third interaction is with transitioning to another type (not civic) of more connected status. Here the change in coefficient between 2004 and 2008 seems to run in the same direction as for those becoming civic-minded in that the power of income to influence well-being is diminished after transition. Here, however, before the transition these individuals were on average more dependent on income than the non-changers with a significant interaction of 0.11, which then drops to a non-significant 0.02 in 2008. This positive interaction in 2004 may reflect the fact that those making the transition were likely to be in the less well-connected statuses to begin with. Again the Wald test does not provide robust evidence that this is a true difference between time-points with a p-value of 0.15, although as we see in the later models, the finding is consistent. The effect of income for those transitioning to another less connected status is not significantly different in the two years, nor to the non-changers in either year. Finally, those making the move to a differently-connected status have positive interactions at both times. The coefficient increases from a borderline significant 0.15 in 2004 to a significant 0.25 in 2008. The p-value of the Wald test tells us that there is not strong evidence for a change in the four-year gap, and that constraining the parameters to be equal does not harm the model fit at all.

		2C: with controls for age and sex				2D: with full set of controls			
		2004		2008		2004		2008	
		b	**SE**	**B**	**SE**	**b**	**SE**	**b**	**SE**
	Household income	**0.07**	**0.02**	**0.19**	**0.03**	0.02	0.02	**0.10**	**0.02**
Starting class (ref cat is civic-minded)	Instrumental	**-0.20**	**0.06**	**-0.21**	**0.06**	-0.03	0.06	-0.05	0.06
	Emotionally isolated	**-0.75**	**0.08**	**-0.61**	**0.09**	**-0.40**	**0.08**	**-0.26**	**0.08**
	Socially isolated	**-0.46**	**0.07**	**-0.28**	**0.06**	**-0.21**	**0.06**	-0.04	0.06
	Traditional	**-0.20**	**0.04**	**-0.15**	**0.04**	*-0.06*	*0.04*	-0.02	0.04
	Integrated	-0.05	0.04	-0.05	0.04	0.01	0.03	0.00	0.04
Transition into… (destination class)	Civic-minded	0.05	0.05	*0.09*	*0.05*	0.01	0.05	0.02	0.05
	Emotional isolation	**-0.23**	**0.08**	**-0.41**	**0.07**	*-0.14*	*0.07*	**-0.30**	**0.07**
	Other less	-0.05	0.03	**-0.07**	**0.03**	0.01	0.03	-0.04	0.03
	Other more	**0.10**	**0.04**	*0.07*	*0.04*	0.04	0.04	0.00	0.04
	Different	0.05	0.06	*-0.13*	*0.07*	0.07	0.06	*-0.12*	*0.06*
Interactions: transitions * household income	Trans to civic * inc[1]	0.07	0.07	*-0.12*	*0.06*	0.03	0.06	-0.06	0.06
	Trans to emot-isol *inc[2]	**0.30**	**0.13**	-0.01	0.10	0.06	0.12	-0.13	0.09
	Other more * inc[3]	**0.12**	**0.05**	-0.01	0.04	*0.08*	*0.04*	-0.01	0.04
	Other less * inc	0.04	0.04	-0.01	0.04	0.05	0.04	-0.02	0.04
	Different trans * inc[4]	0.12	0.08	**0.20**	**0.09**	0.04	0.07	0.10	0.09
Control variables									
	age	-0.03	0.00	**-0.02**	**0.00**	**-0.02**	**0.00**	**-0.02**	**0.00**
	age squared/ 100	0.04	0.00	**0.03**	**0.00**	**0.03**	**0.00**	**0.02**	**0.00**
	female	**-0.05**	**0.02**	-0.02	0.02	0.03	0.03	**0.06**	**0.03**
	live alone					-0.05	0.04	*-0.07*	*0.04*
Class - reference is professional/ managerial	Intermediate					0.04	0.03	0.03	0.04
	Routine					0.03	0.04	0.01	0.04
Job status - reference category is in employment (or self-employed)	not in employment					*0.11*	*0.06*	*0.11*	*0.06*
	trouble paying housing					**-0.53**	**0.06**	**-0.50**	**0.05**
	full time study					0.12	0.08	*0.20*	*0.12*
	unemployed					**-0.30**	**0.07**	**-0.40**	**0.07**
	retired					0.05	0.05	0.04	0.06
	family care					0.03	0.04	**-0.09**	**0.05**
	long term ill					**-0.87**	**0.06**	**-0.92**	**0.06**
Marital status - ref. is married/ cohabiting	divorced/ separated					**-0.39**	**0.04**	**-0.34**	**0.04**
	widowed					**-0.32**	**0.06**	**-0.33**	**0.06**
	never married					**-0.15**	**0.04**	**-0.16**	**0.04**
	agreeableness					**0.03**	**0.00**	**0.03**	**0.00**
	conscientiousness					**0.04**	**0.00**	**0.03**	**0.00**
	extraversion					**0.02**	**0.00**	**0.02**	**0.00**
	neuroticism					**-0.08**	**0.00**	**-0.07**	**0.00**
	openness					**-0.02**	**0.00**	**-0.01**	**0.00**
	Constant	**5.86**	**0.10**	**5.61**	**0.10**	**5.60**	**0.16**	**5.53**	**0.15**
	Model fit/test statistics								
	R-squared	0.04		0.04		0.18		0.17	
	Wald test[1] (1 df)	4.11	P = 0.04			1.20	p = .27		
	Wald test[2] (1 df)	3.42	p = 0.06			1.60	p = .21		
	Wald test[3] (1 df)	3.99	p = 0.04			2.25	p = 0.13		
	Wald test[4] (1 df)	0.49	P = 0.48			1.36	p = 0.24		

Table 6.7 Multiple group linear regression model with interactions between income and transition type, with socio-demographic and personality controls

Table 6.7 shows the same model with control variables added to eliminate possible confounding effects. It is demonstrated in Model 2C that the significant interaction terms and the Wald test hold after including age and sex. In fact, in this model the Wald test results produce p-values which are more significant; it seems likely that the difference between before and after for those who become civic-minded (p = 0.04), those who transition to 'different' (p = 0.04) and to a lesser extent, emotionally isolated (p = 0.06) represent real individual change. In Model 2D, on the other hand, with the addition of all controls namely, marital status, job status, living alone, trouble paying for housing, and the big five personality traits, the interaction effects disappear entirely, and the Wald tests are non-significant.

In an attempt to determine if any control in particular can be held responsible as the confounder, they are systematically added to the model one by one and the results of the Wald test noted. In the interest of space, the models are not reported in full but the p-values of the Wald tests summarised and shown in Table 6.8. The rows refer to the particular controls under scrutiny; job status refers to the model results when job status is the only control in the model, and so on. For all, the baseline model is 2C and in all cases the coefficient estimates remain similar to those reported in Table 6.7. The columns show the parameter being tested for equality and refer to the numbering of the interaction variables in tables 6.7, so that 1 refers to civic-minded, 2 to emotional isolation, 3 to other more, and 4 to different.

	Wald test p-values			
Controls	1	2	3	4
Job status	0.07	0.09	0.14	0.66
Housing pay probs	0.07	0.07	0.05	0.63
Marital status	0.06	0.06	0.05	0.54
Big five	0.13	0.17	0.04	0.37
Live alone	0.06	0.06	0.07	0.45

Table 6.8 P-values from Wald tests on constrained parameters in the presence of control variables; baseline model in Model 2C

Reading down the columns starting with civic-minded; the Wald test for a change in the income relationship has a borderline significant p-value when controlling for job status only, marital status only, living alone only, and trouble paying for housing. When the big five traits are added, however, the p-value increases to 0.13. For the transition to emotional isolation, the p-value similarly increases to well outside the zone of borderline significance only when controlling for personality. On the other hand, the change for those transitioning to 'other more' remains significant even with personality controls present. Overall, among these three

transition types it seems difficult to isolate a single confounder. The Wald test for transitioning to different does not approach significance in any model, so it is concluded that no change in the income-satisfaction relationship occurred for this group.

	3A: Transition financial situation interactions				3B: with prior satisfaction			
		2004		2008	2004		2008	
		b	**SE**	**B**	**SE**	**b**	**SE**	**b**	**SE**
	Household income	**-0.06**	**0.02**	-0.01	0.02	-0.02	0.01	0.01	0.01
	Financial situation	**0.43**	**0.02**	**0.40**	**0.02**	**0.23**	**0.02**	**0.29**	**0.02**
Starting class (ref cat is civic-minded)	Instrumental	-0.08	0.06	-0.08	0.06	-0.01	0.05	-0.03	0.06
	Emotionally isolated	**-0.43**	**0.08**	**-0.26**	**0.07**	**-0.19**	**0.06**	-0.09	0.07
	Socially isolated	**-0.42**	**0.06**	**-0.31**	**0.07**	**-0.19**	**0.05**	**-0.14**	**0.06**
	Traditional	**-0.15**	**0.04**	**-0.12**	**0.04**	-0.03	0.03	-0.02	0.03
	Integrated	-0.02	0.04	-0.03	0.04	0.04	0.03	0.02	0.03
Transition into… (destination class)	Civic-minded	0.07	0.17	-0.04	0.15	0.04	0.15	0.03	0.14
	Emotional isolation	**-0.22**	**0.27**	**-0.44**	**0.33**	-0.14	0.23	**-0.36**	**0.30**
	Other less	0.01	0.10	-0.04	0.09	-0.04	0.08	-0.10	0.08
	Other more	0.04	0.11	-0.07	0.10	0.10	0.09	0.06	0.09
	Different	0.17	0.18	**-0.42**	**0.17**	*0.26*	*0.15*	*-0.27*	*0.15*
Interactions: transitions * fisit	Trans to civic * fisit	-0.02	0.05	0.03	0.05	-0.02	0.05	0.00	0.04
	Trans emot_isol *fisit[1]	0.03	0.09	0.09	0.13	0.07	0.08	**0.12**	**0.11**
	Other more * fisit	0.01	0.04	0.04	0.03	-0.02	0.03	-0.01	0.03
	Other less * fisit	-0.01	0.03	-0.01	0.03	0.01	0.03	0.02	0.03
	Different trans * fisit	-0.03	0.06	0.08	0.06	-0.07	0.05	0.03	0.05
	lifesat 2002					**0.55**	**0.01**	**0.45**	**0.01**
	Constant	**4.09**	**0.07**	**4.19**	**0.06**	**1.67**	**0.06**	**2.06**	**0.07**
	Model fit/test statistics								
	R-squared	0.11		0.12		0.39		0.32	
	Wald test[1] (1 df)					0.17	P = 0.68		

Table 6.9 Multiple group linear regression model with interactions between financial situation and transition type

Turning now to the second indicator of financial stress the 5-point subjective scale 'financial situation'; again interaction terms are generated with the five non-changing transition types and then compared pre- and post-transition. The effects here are weaker than for household income, which is to say that there is less evidence overall for any individual change between 2004 and 2008 of the importance of financial situation on life satisfaction in conjunction with changes in connectedness. In Model 3A (Table 6.9) none of the transition interactions are

significantly different to the non-changing reference category. The 2004 sub-model of Model 3B which includes lagged life satisfaction shows that none of the interactions are statistically significant, in other words that the fisit-satisfaction relationship is the same for each of the transition types when compared to the non-changers. In 2008 there is a single significant interaction which is for those who have become emotionally isolated. The coefficient is positive and of moderate strength (0.12 compared to the main effect of 0.29) indicating that appraisals about personal finances are more important to those who are newly isolated in 2008. The Wald test suggests that there is no real difference between the two times.

As an aside; with financial situation in the model, the main effect of income is now significantly negative in 2004, a somewhat surprising change of direction of effect. Previous analysis has shown that income becomes non-significant when the subjective variable is included which indicates that any effect of objective income is entirely mediated through the subjective. Here, on the other hand, the negative effect of income suggests that if it does not positively influence subjective appraisals of financial circumstances, it actually reduces subjective well-being.

Model 4, in Table 6.10 shows the effect of feeling better or worse off on life satisfaction by transition type. “Worse off” captures changes to the personal financial situation in comparison to the previous year, and is the indicator most closely describing a stressor. The model output shows that none of the interactions between feeling worse off and transition types are significantly different from the main effect of the non-changers, that is, there appears to be no effect at all of a change in connectedness on the level of impact of the stressor. For feeling better off, there is a single significant interaction which is the positive coefficient for those becoming emotionally isolated, who have an additional boost to their satisfaction when things are improving financially when compared to the average among non-changers. This fits with the results revealed for household income, suggesting that by this indicator too, money matters more to the well-being of these individuals. The change between 2004 and 2008 is not statistically significant; therefore there is little evidence that a change takes place in resilience when a change takes place in connectedness by this measure.

	4A: Transition worse off interactions				4B: with prior lifesat			
	2004		2008		2004		2008	
	b	SE	b	SE	**b**	**SE**	**b**	**SE**
Household income	**0.03**	**0.01**	**0.07**	**0.01**	**0.03**	**0.01**	**0.09**	**0.01**
Ref. is 'about the same' — Better off	0.01	0.01	-0.01	0.02	**0.08**	**0.03**	0.02	0.04
Starting class (ref cat is civic-minded) — Worse off	**-0.15**	**0.01**	**-0.13**	**0.02**	**-0.29**	**0.04**	**-0.25**	**0.03**
Instrumental	**-0.03**	**0.01**	**-0.04**	**0.01**	-0.06	0.05	-0.10	0.06
Emotionally isolated	**-0.11**	**0.01**	**-0.08**	**0.01**	**-0.28**	**0.06**	**-0.21**	**0.07**
Socially isolated	**-0.09**	**0.01**	**0.08**	**0.01**	**-0.25**	**0.05**	**-0.24**	**0.06**
Traditional	**-0.10**	**0.01**	**-0.10**	**0.02**	**-0.08**	**0.03**	**-0.10**	**0.03**
Integrated	**-0.03**	**0.01**	**-0.04**	**0.01**	0.01	0.03	-0.02	0.03
Transition into… (destination class) — Civic-minded	0.02	0.01	0.03	0.02	0.04	0.06	0.08	0.07
Emotional isolation	-0.02	0.01	*-0.03*	*0.02*	0.02	0.09	-0.03	0.18
Other less	-0.01	0.01	**-0.03**	**0.02**	0.01	0.03	-0.06	0.04
Other more	0.01	0.01	**0.03**	**0.02**	0.02	0.04	0.06	0.05
Different	0.02	0.01	**-0.05**	**0.02**	0.10	0.07	**-0.25**	**0.08**
Interactions: transitions * better off compared to last year — Trans to civic * better	-0.01	0.01	-0.02	0.01	-0.10	0.10	-0.09	0.12
Trans to emot-isol * better[1]	*0.02*	*0.01*	0.00	0.02	**0.43**	**0.21**	0.18	0.51
Other more * better	0.01	0.01	-0.01	0.01	0.06	0.07	-0.02	0.08
Other less * better	-0.02	0.01	-0.01	0.01	*-0.12*	*0.06*	-0.02	0.08
Different trans * better	-0.01	0.01	0.00	0.01	-0.03	0.13	-0.04	0.16
Interactions: transitions * worse off compared to last year — Trans to civic * worse	0.00	0.11	-0.01	0.01	-0.04	0.11	-0.02	0.09
Trans to emot-isol * worse[2]	-0.02	0.01	-0.01	0.02	*-0.41*	*0.22*	-0.29	0.27
Other more * worse	0.01	0.01	-0.02	0.01	0.09	0.07	-0.03	0.06
Other less * worse	-0.02	0.01	-0.01	0.02	-0.06	0.06	-0.04	0.06
Different trans * worse	0.01	0.01	0.02	0.01	-0.17	0.13	0.09	0.12
lifesat 2002					**0.58**	**0.01**	**0.49**	**0.01**
Constant	**2.26**	**0.05**	2.832	**0.06**	**2.26**	**0.05**	**2.83**	**0.06**
Model fit/test statistics								
R-squared	0.04		0.04		0.04		0.04	
Wald test[1] (1 df)					0	P = 0.98		
Wald test[2] (1 df)					0	P = 0.92		

Table 6.10 Multiple group linear regression model with interactions between feeling better or worse off and transition type

Overall, the analysis provides indications that shifts occur in the degree to which money contributes to life satisfaction for three of the five transition types: becoming civic-minded, or another more-connected class, and less convincingly for those moving to emotional isolation. However, it seems only valid for the objective indicator, household income, whereas no change occurred in the relationship of the subjective indicators and satisfaction. The possible reasons for this finding are considered in the summary and conclusions section.

6.6.3 The role of extreme need

The descriptive analysis showed that overall changes in income were modest on average and not significantly patterned by transition type. To further test that the observed results are not driven by need, for example where the change in connectedness may have coincided with escaping poverty, the income model is re-run with an additional control for the lowest in quartile, where the cut-off for which is an equivalised monthly income of £1,218[26]. The results are shown in the appendix, Table A2.1. The findings relating to a transition to civic-minded remains robust both in terms of the coefficient estimates, which remain largely unchanged from those reported in Model 2A, and the p-values of the Wald test which remains at borderline significance level. The Wald tests for transition to emotional isolation and to 'other more' with income are not significant once low income is controlled for, although the coefficient estimates remain largely unaffected.

6.6.4 Additional robustness checks

Several additional checks are carried out to exclude other potential unobserved confounders. Firstly, because the transition types may be associated with clusters of starting connectedness, for example, those transitioning to other less are all from the fairly well-connected classes 4, 5 and 6, it is necessary to rule out any masked effects of starting class. To the income protective factor model interaction terms are added for the starting class with the indicator of financial stress. The model is shown in the appendix, Table A2.2. Again we see the findings for 'other more' and emotional isolation drop to non-significant while the Wald test for change in the interaction term for transition to civic-minded remains borderline significant.

Secondly, the controls in models 2C and 2D included marital status and job status. However, there is a possibility that the average effect of these factors is not the same as the effect of a status change such as those shown in Table 6.4. The effect of a change in status may be more powerful than the status itself as suggested by the literature on life events (e.g. Headey and Wearing 1989; Suh et al. 1996). Additionally, status change is known to influence longer terms patterns of income, including the possibility of financial stressors; a new relationship, for example, is linked to a pattern of 'rising' income, relationship dissolution or the onset of disabling illness increase the likelihood of 'fluctuating' income, while retirement or having a child are linked to 'falling' income patterns (Rigg and Sefton 2006). Given that becoming retired is associated with an increased chance of a move to civic-mindedness, a life change that is also likely to see changes in income and increases in satisfaction, this specific life

[26] I take a different approach to Chapter 5, where the models are re-run excluding the lowest quartile, to avoid the problem of whether to exclude those who were in this quartile at Time 1, Time 2, or both.

trajectory needs to be controlled for. Similarly, the newly ill as an economic status and the newly unemployed are slightly more likely to transition to emotional isolation, both of which are likely to bring about drops in life satisfaction; again these life events need to be eliminated as possible confounders.

An additional set of controls are added to the income model which capture the possible status changes. Firstly for job status: newly retired, newly employed, newly unemployed, newly studying, and newly ill are included. Secondly, for changes to relationship status: new relationship, relationship split, and widowed are added (Table A2.3). In the presence of all these status change controls the income interaction coefficients for transitioning to civic-minded are of similar magnitude and significance as reported above. Again the changes associated with a transition to emotional isolation or 'other more' are similar according to the coefficient estimates but not by the Wald test.

Overall, it seems that the change in resilience for those transitioning to civic-mindedness is robust to all the additional controls. For this transition, then, it is factors associated with the connectedness driving the change in resilience. The loss of significance for other transition types may indicate some confounding with (changes to) socio-economic conditions.

6.7 Summary and conclusions

This analysis has explored the dynamics of psychosocial resilience and provided evidence in support of the hypothesis that changes in connectedness bring about changes in resilience, particularly where changes to a more connected network type are observed. Accepting this evidence is to implicitly take resilience as a dynamic factor, and connectedness understood as an external resource that has an effect on the individual. All of the evidence for the changeable nature of resilience comes from the protective factor models where the indicator of financial circumstances (or level of the stressor) is household income, the most objective measure of the three used. The model showed that the effect of income on happiness was reduced after a transition into a more connected status taken place, either to civic-minded or another. This means that, from whichever starting connectedness type, adding social ties can seemingly bring about a change in the extent to which income is necessary for subjective well-being. This shift suggests a reframing process whereby the role of income is relegated to a lesser role in the evaluation of satisfaction with life. The shift in effect size of the main effect of income between Time 1 and Time 2 is suggestive of a hedonic treadmill effect whereby pay increases are assimilated and aspirations accordingly raised (Easterlin 2003; Di Tella et al 2007; Stutzer 2004); those increasing their social ties in this time seem immune to this effect. The change in

the role of income for happiness holds when controlling for age, sex, marital status, living alone, job status, and severe financial difficulty, and is weakened but not entirely diminished by controlling for prior levels of happiness and personality.

In spite of this strong evidence for a change in the role of income, the results relating to subjective financial situation rating and feeling better off or worse off runs counter to the idea of changeable levels of resilience. Coping with feeling worse off does not appear to change with increases in connectedness. Neither are any of the transition type interactions significant at either time, which is to say that there is no evidence for a predisposition to resilience to financial shocks before a transition in personal network type.

We need to ask why, if resilience is increased by adding social ties as is suggested by patterns of household income on life satisfaction, there is no evidence that those making these types of transition find coping with feeling worse off, or with financial struggles any easier. This partial evidence can be interpreted as indication that the measurement matters. It is conceivable that household income is not a good indicator of stress and of the coping mechanisms implied in the definition of resilience. Feeling worse off, on the other hand, is a much more direct marker of financial stress, as are the low-end items of the financial situation rating. This situation rating is also dependent to some degree on comparison to previous years and probably also on a host of other personally relevant factors. This interpretation would imply that a shift to civic-mindedness or 'other more' influences aspirations, goals and the importance of money, while having little impact on the coping mechanisms in the presence of stressors.

A second explanation is that if the mechanism of effect is through a 'reframing' of life satisfaction, which is to say that it is construed through meaningful social ties rather than financial circumstances, it perhaps follows that these financial factors are themselves differently appraised. In short, the lack of change in resilience by subjective measures can be explained by a modification in the relationship between the objective and subjective through similar mechanisms hypothesised to influence life satisfaction. This explanation can account for the lack of effect seen in the two subjective measures while an effect is observed in the objective. There are studies to support the idea, for example, those with a higher degree of support reported less economic hardship in the USA (Henly et al. 2005). This second explanation receives specific attention and support in Chapter Seven.

The significant interactions of household income, financial situation, and feeling better off with moving to emotional isolation are positive thus indicating that more income is needed, or a

higher subjective rating, to achieve the same level of satisfaction as others. For the subjective measures, the evidence for change pre- and post-transition is limited but it is clear that having low resilience to financial concerns, or, in other words, a greater dependence on money for happiness is associated with becoming emotionally isolated. Poverty is ruled out as a driver of this pattern, although one plausible explanation is that placing too much emphasis on material matters may be harmful to personal relationships. Another is that the absence of reliable supportive ties (through time) generates unhappiness and stress, a backdrop against which sense of worth and self-esteem may be generated through financial rather than social rewards (Kasser and Ryan 1996; Kasser et al 1995). Individuals experiencing low self-esteem and stress may consume goods to feel better about themselves, a strategy that may be doomed to makes things worse (Ruvio et al. 2013). This adds an additional dimension to the relationship between connectedness and resilience; here it appears that low resilience is a possible cause of social isolation and not the other way round.

In summary, this analysis has two main findings. Firstly, that a move into a personal network of type 'civic-minded' or 'other more' changes the extent to which household income is needed for SWB. Despite this, it is not evident that any change occurs in resilience to financial shocks as they are subjectively felt. Secondly, the models have highlighted that those who become emotionally isolated had low resilience in terms of income before the change in network. As the effect holds in terms of coefficient estimates when the lowest income quartile is controlled, it is probable that an emphasis on material goals rather than social ones can explain the pattern.

As for the nature of resilience, the observed changes in time which coincide with changes in connectedness show that the degree to which income brings satisfaction is not stable within individuals and thus is separable from the stable traits such as dispositional happiness and personality. Despite the evidence for separability, the presence of lagged life satisfaction and personality do bring about a weakening in the evidence for difference between times, so it is likely that they play a part in enabling changes to connectedness and shifts in the appraisal of income. However, the findings, especially as regards the transition to the most-connected network type, are not explained away by either of these factors. It can be concluded, therefore, that despite the strong role of dispositional factors, there is something about the network and not just the person that brings about psychosocial resilience.

Chapter 7. Who cares what the neighbours earn? An examination of the effects of social comparison on the well-connected and the isolated

The focus on social comparison in this chapter is intended to unravel two puzzles that have emerged throughout this study. Firstly, the analyses in Chapters Five and Six showed that the effect of connectedness as a resilience resource depends upon the stressor, with bigger differences evident for household income than perceived financial situation. The proposed reason for this disparity is that connectedness influences the appraisal of financial circumstances as well as satisfaction with life overall. The second point to address arises from the theoretical framework and concerns the conflicting hypotheses of psychological benefits and social comparison, particularly for those who are not well off but with extensive social networks. We saw in Chapter Five that the happiness of the civic-minded is resilient to income across the income distribution. This leads to the conclusion that even at low incomes the well-connected can maintain high SWB despite the likelihood of their network including people better off than themselves. In turn, this suggests that well-connected people do not use their relative income position when appraising their life satisfaction. The literature on social comparison suggests, on the other hand that exposure to a reference group increases the effects of social comparison and the position of the well-connected may therefore be considered somewhat paradoxical. It implies new possibilities about the mechanism of social comparison and relative income. Greater exposure to, and therefore greater knowledge of, the earnings and lifestyles of others, may lead to a *reduction* in the effect of relative income and conversely that *less* knowledge of the habits of one's neighbours brings about *increased* consequences for well-being. There is evidence that supports the assumption that exposure increases comparison. Luttmer et al. (2005) and Stutzer (2004), for example, show that the more social interaction in the neighbourhood, the greater the comparison effect. However, this chapter extends the mechanism of psychological benefits to social comparison and hypothesises that social contact may reduce negative comparison effects.

7.1 The mechanisms of social comparison

Festinger asserts, in one of his seminal works: "there exists, in the human organism, a drive to evaluate his opinions and his abilities" and "[t]o the extent that objective, non-social means are not available, people evaluate their opinions and abilities by comparison respectively with

the opinions and abilities of others." (1954, pp. 117-8) The importance of comparison is thus theorised to be greater where there is no objective measure available; life satisfaction and perceived financial situation are entirely subjective in their nature and therefore bring relative standing to the fore as a means of appraisal.

At the core of social comparison theory is the idea of the reference group, the specific or generalised "others" which serve as the point against which personal aspects of one's life can be appraised. It has its roots in the work of symbolic interaction theorists such as Cooley (1902), Mead (1934) and Goffman (1959) in which it is noted that opinions of others form the major source of the self (Suls and Miller 1977; Thoits 2013). These opinions that others have about us, or more particularly our *perceptions* of those opinions, guide our self-evaluations and thus "we see ourselves mirrored or reflected in the eyes of other people" (Thoits, 2013, p. 360). This theory is one that emphasises external causes as the source from which 'self-concepts' (such as self-esteem and self-efficacy) are constructed (Gecas and Schwalbe 1983). The highly socialised nature of people in this account is endorsed by research showing that individuals have a lack of awareness of (or at least a reluctance to admit to) their comparison habits (Gibbons and Buunk 1999) and that comparison is "spontaneous, effortless, and unintentional" (Gilbert et al. 1995, p. 227). Brickman and Bulman (1977), based on their laboratory experiment with college students, describe comparison as an 'inevitable' consequence of social interaction. This assertion will be scrutinised here; experiments cannot replicate the social forces experienced in daily life, and it is unlikely that findings relating to young adults can be generalised to all.

This account of comparison as inevitable does not explain individual differences in the extent to which evaluations depend upon comparison. However, several studies do emphasise such sources of variation; Gecas and Schwalbe (1983), for example, show that autonomy and self-efficacy play a role in determining the strength of the "looking-glass" effect of reference groups. The degree to which comparison matters for evaluations of the self has been shown to vary by neuroticism and openness, age, health and by the uncertainty that might be associated with times of stress or change (Gibbons and Buunk 1999). In addition, as mentioned above, the degree of social interaction may influence the size of the comparison effect.

The psychological goods argument outlined in Chapter Two stated that the self-worth and sense of control gained from strong and weak social ties reduce the need for money for life satisfaction. This argument is backed by social comparison research which provides evidence that similar psychological factors are associated with lower comparison. Gecas and Schwalbe

(1983) demonstrate that those with low self-esteem and who are lower in the status hierarchy are more dependent upon the opinions of others for self-evaluation. They theorise a distinction between *inner* self-esteem which is earned rather than given and based on feelings of one's own capacity and competence, and *outer* self-esteem which is concerned entirely with the approval of others. It is expected that individuals in civic-minded networks are more likely to have this inner self-esteem brought about by their wider and more varied social roles which in turn bring self-esteem, purpose and meaning (Thoits 2013) and a sense of control (Johnson and Krueger 2006; Ross and Mirowsky 2013). Having a strong sense of inner self-esteem displaces or diminishes the importance of reference groups as a source of information for self-appraisal. While a dependence on outer self-esteem might suggest that more social comparison occurs overall, some suggest that low self-esteem is associated with comparison in a particular direction. From the symbolic consumption perspective, it may be that individuals with restricted networks, and/ or low self-esteem may be more reliant on 'conspicuous consumption' to feel equal and worthy in their social setting. In a study of perceptions of academic achievement, for example, Wayment and Taylor (1995) showed that those with low self-esteem report using more social comparison that was upward in direction, which is to say towards people achieving higher grades.

It may also be too simplistic to suggest that the socially integrated or the civic-minded engage in less comparison altogether. People who have these wide reaching networks are also more likely to meet others who are experiencing, or have experienced, tough times and who can provide advice and 'threat appraisal' (Thoits 2011). Threat appraisal is akin to downward comparison in its net effect that, relative to others, current circumstances are made to seem less bad. Therefore, it may be that the well-connected are not completely untouched by social comparison, but rather choose, or are unconsciously oriented towards downward rather than upward comparison. Individual choice has been shown to influence the reference group used for comparison (Falk and Knell 2004); similarly, comparison can be directed in such a way so that appraisal information is sought but psychological costs avoided (Brickman and Bulman 1977).

Comparison research has tended to follow one of two tracks. On one hand, there is a body of work focusing on 'similar others' in which it is demonstrated that people may use others with similar levels of education, in the same occupation, or experiencing similar life situations as their point of reference against which to compare (Clark and Oswald 1996; Wood et al. 1985; Gibbons and Buunk 1999). On the other hand, there is a literature showing that the local area

also provides a point of reference, with the effect of average neighbourhood income bringing down SWB in a way that is 'equal and opposite' to that of personal income (Clark et al. 2008; Shields et al. 2009; Luttmer 2005; Stutzer 2004). It is this second track that is under investigation here; this choice is not intended to suggest that neighbours have a stronger effect than peers do as a reference point, but rather that it is the relationship to the wider community, the neighbourhood, which is of particular interest in the context of this research.

Further, a focus on neighbourhood as the reference group allows a way to examine all types of connectedness without addressing the complexity of the different socio-economic profiles of each, which implies that "similar others" may be differently defined for each group. Being emotionally isolated, for example, is associated with just a 35% chance of being in the labour market, so comparisons to colleagues are not particularly relevant. On the contrary it is reasonable to suppose that everyone in the sample has opportunity to be influenced by their neighbours, due to visible wealth and 'conspicuous consumption' patterns if not from knowledge based on inter-personal relationships (Firebaugh and Schroeder 2009); Miles (1998) describes consumption as a non-verbal mode of communication. Indeed, Stutzer (2004) describes community members as "a reference group that can hardly be avoided in everyday life" (p. 3). A further point of interest in a neighbourhood-based approach is that the social activity that defines weak, extended ties is *local* in nature, including Parent Teacher Associations, social groups, and church activities and so on. The assumption that the weak ties are local is the basis from which to test that social interaction with non-intimate others reduces the degree to which comparison with those others can reduce personal SWB. A focus on the geographically local therefore provides a way to unravel the paradox. As organisational activities are likely to be local, it is assumed that the classes with organisations have local ties. The results of this analysis, therefore, can be interpreted as the effect of exposure to the reference group on the degree of comparison with that reference group.

As well as attempting to unravel the social comparison puzzle, this chapter also investigates whether appraisals of financial circumstances are influenced by connectedness and comparison. The findings in Chapter Six revealed that resilience increased after a change to become civic-minded where the stressor is household income, but no change was discerned with perceived financial situation. A possible explanation for these seemingly contradictory findings is that change occurs within the appraisal of financial situation itself, thus making the measurement of the stressor too subjective to detect the change. Therefore, as an extension to the main hypotheses on social comparison, this chapter also sets out to test if

connectedness reduces the degree to which comparison influences perceived financial circumstances.

7.2 Hypotheses

This analysis follows the numerous studies showing that comparison is not 'automatic', and explores connectedness as a further factor that influences the degree of comparison that individuals engage in. Studies of neighbourhood comparison have suggested that costs of upward comparison are greater when having more social interaction with the reference group, and that social isolation may be protective. However, this conclusion is taken to be too simplistic as it fails to take account of opportunities for threat appraisal among the well-connected, and the low self-esteem of the isolated who are expected to compare upward more, not less, than others. This more subtle asymmetrical approach to comparison is explored for both life satisfaction and subjective financial situation. The hypotheses also take account of the established findings from previous analyses in the thesis and therefore focus on specific types of connectedness. The overarching hypothesis is:

> H_3: The well-connected will be protected from the negative effects of being worse off while the isolated will not be.

Which is broken down into the following sub-hypotheses:

> $H_{3.1}$: The civic-minded will have greater gains to their life satisfaction when relatively well-off compared to the neighbours.
>
> $H_{3.2}$: The emotionally isolated will suffer higher costs to their life satisfaction when worse off than the neighbours.
>
> $H_{3.3}$: Appraisals of financial situations vary by social connectedness, with the better-connected being more positive than the socially isolated.
>
> $H_{3.4}$: The civic-minded will have greater gains to their perceived financial situation from being better off than the neighbours
>
> $H_{3.5}$: The emotionally isolated will suffer higher costs to their perceived financial situation from being worse off

7.3 Operationalizing social comparison

Among researchers exploring comparison with neighbours, there is considerable variation in the neighbourhood measurement unit. Luttmer (2005), for example, uses micro-data areas in

the USA which each have a population of 150,000, while Blanchflower and Oswald (2004) use US states. Shields et al. (2009), on the other hand, take advantage of the design of the Household, Income and Labour Dynamics in Australia survey, and use census districts each containing around 200 households. The unit of analysis used in this chapter, Middle Super Output Area (MSOA), is a 'middle-level' geographical unit, of which there are 7,194 in England and Wales, each containing an average population of 7,200 (White et al. 2011). MSOA is a suitable unit for testing hypotheses about comparison as the area is small enough to assume that the individuals are exposed to this reference group, that is, they are likely to see consumption patterns, even if the social interaction is limited. A limitation of using geographical units such as MSOA is that they may not be well aligned to neighbourhoods as perceived by the people living within them and the boundaries may be somewhat arbitrary. This is a potential source of measurement error, with the risk being that the individual's social activity may not be within the same MSOA.

This analysis uses average MSOA income from data generated by the Office for National Statistics. The estimates are based on data collected in 2007 and are thus aligned time-wise with the fieldwork for the 17th wave of the BHPS. The analysis in this chapter is restricted to England and Wales, rather than the entire UK, as the area level data generated by the ONS are based on the MSOAs for just these two countries.

The effect of social comparison is often empirically tested by taking the average income for the reference group of interest and including that, alongside personal income, in the same regression model. The literature shows that effects tend to be equal and opposite; the personal (or household) income coefficient is positive while the coefficient for the mean income of the reference group is negative, therefore pulling down, and in many cases cancelling out the positive effect of money on happiness. Using such an approach, significant comparison effects have been found where the reference group is others in a similar occupation (Clark and Oswald 1996), or the neighbours (Luttmer 2005; Shields et al. 2009; Firebaugh and Schroeder 2009).

This analysis follows a lesser used approach (such as Shields et al. 2009) and aims to empirically separate upward from downward comparison in order to address the hypotheses. Accordingly, rather than having a single variable based on the mean income of the reference group, two dummy variables are generated: one for being better off in comparison to the neighbours and one for being comparatively badly off. This is done, firstly, by splitting both household and neighbourhood income into quintiles, which has the effect of standardising the

differences in the income measures[27]. The area average quintile is then deducted from household quintile resulting in a scale in which a positive number indicates that your household income is high compared to the neighbourhood, while a negative number indicates that the household is relatively badly off. This scale is recoded into a categorical variable with three categories. Scores between -4 and -2 are recoded to "relatively badly off", while scores between 2 and 4 are "relatively well off". Scores of -1 and 1, along with zero, are considered to be "about the same" because these income differences may be too small to be noticeable[28]. This recoding of an ordinal variable enables the hypothesised non-monotonic relationship to be modelled. "Relatively badly off" provides an indication that the position of the individual looking towards their neighbours is in an upward direction, and thereby offers a means of testing for upward comparison. "Relatively well off", conversely, tests for an effect of downward comparison.

Table 7.1 shows, by connectedness type, the frequency and percentage of being relatively well or badly off. Overall about 23% of the sample is quite well off in comparison to the neighbourhood they live in and 17% are badly off. There is some variation by connectedness. Just 13% of the emotionally isolated, for example, are well off compared to their neighbours, and more than average (26% compared to 17%) are relatively badly off. The subsample sizes of the emotionally isolated, with just 19 being well-off and 37 being badly off, are rather small and a possible limiting factor in terms of statistical power to the analysis. The subsample sizes for the instrumental and socially isolated classes are modest at just over 100 in each case. The integrated are slightly more likely to be well off and less likely to be badly off, a difference of around 1 percentage point in each case, whereas the percentage of civic-minded better off or worse off than their neighbours is around average. The distribution of connectedness in MSOAs is shown in Table 7.2. It reveals that the isolated classes are over-represented in the areas falling in the lowest 20% of average incomes, and they are similarly under-represented in the richer areas. This fits with previous findings that isolation is associated with a lack of financial resources.

[27] The difference is the use of a weekly average for MSOA compared to usual monthly income for the household. Both income measures are equivalised for household composition.
[28] The construction of these variables is subjected to sensitivity analysis in section 7.4.

		Relatively well off		Relatively badly off	
	n	n	%	n	%
Instrumental	571	115	20.1	115	20.1
Emotionally isolated	143	19	13.3	37	25.9
Socially isolated	672	118	17.6	124	18.5
Traditional	3,093	744	24.1	478	15.5
Integrated	2,473	600	24.3	387	15.6
Civic-minded	1,290	289	22.4	236	18.3
	8,242	**1,885**	**22.9**	**1,377**	**16.7**

Table 7.1 Count and percentage of respondents relatively well or badly off compared to their neighbourhood, by connectedness type; BHPS Wave 17, 2007

	Lowest quintile	2	3	4	Highest quintile
Instrumental	29%	21%	17%	16%	16%
Emotionally isolated	28%	19%	20%	17%	16%
Socially isolated	34%	19%	18%	16%	13%
Traditional	29%	18%	21%	18%	15%
Integrated	24%	18%	20%	21%	18%
Civic-minded	19%	16%	19%	22%	24%
	26%	**18%**	**20%**	**19%**	**17%**

Table 7.2 MSOA income quintile distribution by connectedness

7.3.1 Additional controls

In addition to the controls used in previous chapters that may confound connectedness, money and satisfaction, the comparison literature highlights the need for some additional specific controls for local area effects. Firstly, local areas with high average incomes also have less crime, better schools and so on. Therefore, despite potential for upward comparison, area income appears to have a positive relationship to "satisfaction with town or city" suggesting that people recognise and appreciate that they live in a nicer area (Luttmer 2005) and perhaps benefit from "the better address" prestige effect (Firebaugh and Schroeder 2009). This would be expected to have a reverse effect on SWB to upward comparison. To separate the 'pleasantness of the area' as a source of well-being, Shields et al. (2009) include percentage lone parents and percentage non-English speaking immigration as indicators of deprivation. These have a negative effect on individual SWB and average income (social comparison) has an independent negative effect. Taking a similar approach, the control variable used here is the

percentage of households in the neighbourhood experiencing three or more deprivation factors as defined by the ONS using census data. The deprivation factors are counted at a household level and include unemployment (or long-term sickness), education level below level 2 (5 GCSEs), having poor health or a disability, and overcrowded accommodation (Office for National Statistics 2001). This control is correlated with average area income at -0.58, which although moderately high, does not present a risk to the reliability of estimates due to multicollinearity, and brings the advantage that it allows the separation of the comparison effect from the better address effect.

A control for home ownership, either outright or with a mortgage, is also included because of the potential benefit that could offset the negative consequences of upward comparison. For example, renting in an area in which home ownership is prevalent reduces satisfaction with housing and with life overall (Vera-Toscano 2008). It is also necessary to control for length of time spent in the neighbourhood as this is shown to have a positive effect on SWB (Shields et al. 2009) and may be confounded with connectedness, because opportunities for social ties increase with length of time in the neighbourhood (Cattell 2001). It is also possible that newcomers into an area are particularly susceptible to comparison effects perhaps due to its very unfamiliarity, or because they are more likely to be dissimilar to others in the neighbourhood. This is operationalised with a single binary control variable "recent move" which takes the value of 1 if a move has occurred in the last year, or 0 if not. Region is also added as a control to ensure that results are not skewed by a particular region such as London where costs of living are high.

A final control is life satisfaction from a prior wave to rule out the reverse causal explanation that intrinsically happy people may be better equipped to be resilient to the 'rougher aspects' of low-income areas (Luttmer 2005). In addition, unhappy people appear to be more affected by unfavourable comparison than happy people are (Lyubomirsky and Ross 1997) and the inclusion of the lagged dependent variable is intended to control for such dispositional factors.

7.4 The models

The analysis is based on a single wave of the BHPS, 2007, this being the one most closely aligned in terms of data collection timing to the available income estimates for MSOAs. Respondents in Scotland and Northern Ireland are dropped; this reduction in the sample is offset by the benefit of having a reliable and consistent area income measure available for England and Wales. Multilevel models are used to account for the clustered nature of the responses. Individuals are at level 1, nested within households at level 2, nested within MSOAs

at level 3. The models used are random intercept models, where the mean (i.e. intercept) of the outcome is allowed to vary for each of the three levels thus producing an error term of residuals from the group means. The level-specific error term variances are divided by the total variance to determine the intra-class coefficients (ICC) which are used to gauge the degree of similarity among the observations within-group. The baseline partition of variance is established in the 'empty model', a model with no covariates. The models are fitted using maximum likelihood and the log likelihood and AIC are reported for each.

7.4.1 Empty models

The empty models for both life satisfaction and perceived financial situation are shown in Table 7.3. To compare like with like in terms of the residual variances and fit statistics the sample in Model 1A is restricted to cases with non-missing financial and connectedness data. The Sample for life satisfaction consists of 7,932 individuals, within 4,623 households and 2,033 neighbourhoods, and is consistent across the main models before controls are added. For perceived financial situation the sample contains 8,028 individuals, 4,660 households and 2,040 neighbourhoods and is consistent across the main models.

Model 1A shows that 77.9% of the variance in life satisfaction can be explained at the individual level, 20.4% at household level, and just 1.7% explained by clustering within MSOA. The variance components for the subjective rating of financial situation are somewhat different, with a greater impact of household (43.6%) clustering and a smaller percentage of the variance at individual level (51.7%). Household therefore has a stronger influence on appraisals of financial matters than on appraisals of life satisfaction, perhaps because of the pooling of resources and material aspirations within households. The low level of variance explainable at the MSOA level is not surprising, and fits with similar research on well-being in the UK (e.g. Ballas and Tranmer 2011; Propper et al. 2005).

1A: Null model - life satisfaction			
Fixed part of model	**b**	**SE**	
Constant	**5.23**	**0.02**	
Random Intercepts	**var**	**SE**	**ICC**
Level 3: MSOA	0.03	0.01	**1.7%**
Level 2: Household	0.31	0.03	**20.4%**
Level 1: Individuals	1.18	0.03	**77.9%**
Log likelihood	-12788.43		
AIC	25584.9		

1B: Null model - financial situation			
Fixed part of model	**b**	**SE**	
Constant	**2.95**	**0.01**	
Random Intercepts	**var**	**SE**	**ICC**
Level 3: MSOA	0.04	0.01	**4.7%**
Level 2: Household	0.39	0.02	**43.6%**
Level 1: Individuals	0.46	0.01	**51.7%**
Log likelihood	-10396.52		
AIC	20801.0		

Table 7.3 Three-level variance components models for life satisfaction and financial situation

7.4.2 Life satisfaction

The main effects of connectedness, household income and area income on life satisfaction are shown in Table 7.4. Model 2A, firstly, includes the area-level explanatory variables and shows no effect of area income independently of being better or worse off. Living in an area where household income is substantially lower than average area income has a small negative effect on life satisfaction (b = -0.07, SE = 0.04) although this estimate is not significantly different to zero at the $p < 0.05$ level. On the other hand, being relatively well off has a significant positive effect (b = 0.19, SE = 0.04). The proportion of deprived homes in the neighbourhood has a negative effect on satisfaction (b = -0.03, SE = 0.01). The proportional reduction of error (PRE) at the MSOA level, once these area-level independent variables are added is 30%. This may suggest that area income characteristics are able to explain a moderate amount of the higher level variance, although examination of the standard errors of the residual variance estimates indicates that this shift is not statistically significant.

The addition of household income in Model 2B reduces the effect of being relatively badly off to zero, and the effect of being well off compared to the neighbours is reduced to 0.12 (SE =

0.05). The PRE at level 2 is 2% having added the household-level variable. Connectedness, the individual-level variable, is included in Model 2C. Concurring with previous chapters, there is a main effect of connectedness whereby all types have lower life satisfaction than the civic-minded. This is statistically significant for all but the integrated and largest for the emotionally isolated whose satisfaction is 0.65 lower than the civic-minded having taken into account their financial circumstances. Comparing Model 2C with the null model, the PRE at individual level is less than one per cent while the PRE at household level is 8%[29]. The AIC reduces with each additional explanatory variable suggesting that each is able to explain significantly more variance in the dependent variable.

Life satisfaction	Model 2A			Model 2B			Model 2C		
Fixed part of model	**b**	**SE**		**b**	**SE**		**b**	**SE**	
Area income	0.09	0.12		-0.09	0.13		-0.13	0.13	
Relatively badly off	*-0.07*	*0.04*		0.01	0.05		0.02	0.05	
Relatively well off	**0.19**	**0.04**		**0.12**	**0.05**		**0.11**	**0.05**	
Deprived homes in area	**-0.03**	**0.01**		**-0.03**	**0.01**		**-0.03**	**0.01**	
Household income				**0.09**	**0.03**		**0.08**	**0.03**	
Instrumental							**-0.16**	**0.06**	
Emotionally isolated							**-0.65**	**0.12**	
Socially isolated							**-0.25**	**0.06**	
Traditional							**-0.18**	**0.04**	
Integrated							-0.05	0.04	
Constant	**5.37**	**0.04**		**5.36**	**0.04**		**5.47**	**0.05**	
Random Intercepts	**var**	**SE**	**ICC**	**var**	**SE**	**ICC**	**var**	**SE**	**ICC**
Level 3: MSOA	0.02	0.01	**1.2%**	0.02	0.01	**1.2%**	0.02	0.01	**1.2%**
Level 2: Household	0.30	0.03	**20.3%**	0.30	0.03	**20.1%**	0.28	0.03	**19.2%**
Level 1: Individuals	1.17	0.03	**78.5%**	1.17	0.03	**78.7%**	1.17	0.03	**79.5%**
Log likelihood	-12758.94			-12754.56			-12728.02		
AIC	25533.9			25527.12			25484.04		

Table 7.4 Three-level random intercepts models testing the effect of relative income position on life satisfaction; Coefficients highlighted in bold are statistically significant at p < 0.05

The life satisfaction models with connectedness and interaction terms are shown in Table 7.5. In addition to the interactions with well and badly off in Model 3A, interactions with income are included as a control variable in Model 3B so that the relative income coefficients are not

[29] This suggests that connectedness, though an individual level variable, has an effect that is felt at the household level. This is interesting and worthy of further investigation but falls outside the scope of this project.

vulnerable to confounding effects of the personal financial situation. Due to their extensive discussion in previous chapters, the connectedness effects and interactions with household income are not described in detail here. In brief, they show that, as found in Chapter Five, all the income interactions are positive indicating that income is more important to the life satisfaction of all other groups in comparison to the civic-minded.

The interaction terms with being relative well off and relatively badly off are similar in terms of effect size and significance in both models 3A and 3B. Turning first to the interaction terms with being relatively well off; the effect for the instrumental is of borderline significance and negative (b = -0.28, SE = 0.16) suggesting that they gain less life satisfaction from having an income higher than their neighbours compared to the civic-minded. The other classes do not appear to be any more or less influenced by being better off than the neighbours. The main effect of being better off than the neighbours represents the size of effect for the civic-minded and is larger (b= 0.19, SE = 0.09) than the average effect in Model 2C. For badly off, there is one statistically significant interaction in Model 3A, namely the emotionally isolated, who, when living in close proximity to others better off than themselves suffer a cost to their life satisfaction of a full point on the 7-point scale (b = -1.15, SE = 0.30). A further two interaction terms are of borderline significance with a p value between 0.05 and 0.1; these relate to the integrated (b = - 0.22, SE = .012) and the instrumental (b = -0.27, SE = 0.16) who both suffer a greater loss in satisfaction than the civic-minded when relatively badly off. The other connectedness types do not experience effects to their life satisfaction any differently to the civic-minded when having a lower income than the area average. It is interesting that the main effect of 'badly off' is positive, and of borderline significance in Model 3A though not in Model 3B. This may suggest that the civic-minded are able to take positives from living in an area with higher average income than their own, perhaps appreciating the better features of the houses or neighbourhood without experiencing any 'envy' effects. The emotionally isolated stand out as being the only group who have a lot to lose by comparing themselves to their neighbours.

The log likelihoods improve in each subsequent model of life satisfaction, and the log likelihood ratio tests confirm that the goodness of fit improves in the model with interactions, compared to without. However, the AICs are increased in Models 3A and 3B compared to 2C, suggesting that the addition of the interaction terms reduces the residual error but the models with the greater number of parameters are not parsimonious. Overall, this model provides just weak evidence in support of hypothesis 1A; the effect of being relatively well off on life satisfaction is similar across all classes of connectedness with the possible exception of the

instrumental. There is, on the other hand, stronger evidence in support of hypothesis 1B, that the emotionally isolated are the most vulnerable to the effects of being relatively badly off on their happiness.

To check the robustness of this result a series of controls are added. For reasons of space these are shown in the appendix. Firstly, in Table A3.1, area-level controls are added. A dummy variable for each region of England is included where the reference category is Wales; none have a substantive effect or are statistically significant. With region in the model, the main finding relating to the negative interaction between being emotionally isolated and badly off holds, and in addition the interaction of emotional isolation and well off is now significantly negative. On the other hand, the integrated and instrumental interactions with being badly off are no longer borderline significant. The ICC at level 3 is increased compared to Model 3A; thus region does not contribute to the reduction of area-level variance.

In Table A3.2, controls relating to the household level are added, namely, recent house move, trouble paying for housing and being a home owner. A recent move has no effect on satisfaction while being a home owner has a significant positive effect (b = .23, SE = 0.04). As pervious chapters have shown, trouble paying for housing has a strong negative influence (b = -.61, SE = 0.07). The interaction effects remain largely unaffected by these controls: the interaction term for the emotionally isolated retains a similar effect size and significance level. The controls reduce the level 2 residual variance by a small amount, and the ICC drops to 18%.

Controls relating to the factors that may influence the effects of relative income position at the individual level are added in three blocks, Table A3.3. Lagged life satisfaction, firstly, has a strong positive effect on current life satisfaction (b = 0.61, SE = 0.01). With prior satisfaction controlled, the emotionally isolated and badly off interaction remains similar in magnitude and significance (b = -1.04, SE = 0.25). In addition, two of the 'well off' interactions become significant: for the instrumental and emotionally isolated, adding support for hypothesis 3.1. The main finding for the emotionally isolated remains robust to the presence of socio-economic controls though is slightly reduced in magnitude (b = -0.87, SE = 0.30). With these controls in place the interactions relating to the instrumental become statistically significant both for being badly off (b = -0.32, SE = 0.16) and well off (b = -0.33, SE = 0.15).

The big five personality traits are introduced separately because they are available in just a single wave (2005) and reduce the effective sample size. Here the emotional isolation interaction coefficient is reduced in magnitude by around a half (b = -.47) and is no longer

significant. This suggests that personality may be able to explain this relationship, at least partially. On the other hand, the instrumental interaction with both badly and well off remain robust, and the interaction terms for the traditional are now of borderline significance. Overall, personality, nor indeed any of the other individual controls, can entirely explain away the findings.

Life satisfaction	Model 3A		Model 3B	
Fixed part of model	**b**	**SE**	**B**	**SE**
Area income (centred)	-0.13	0.13	-0.12	0.13
Relatively badly off	*0.17*	*0.10*	0.11	0.10
Relatively well off	**0.19**	**0.09**	**0.23**	**0.09**
Deprived homes in n'hood	**-0.03**	**0.01**	**-0.03**	**0.01**
Household income (centred)	**0.08**	**0.03**	-0.01	0.06
Instrumental	-0.05	0.08	-0.06	0.08
Emotionally isolated	**-0.38**	**0.15**	**-0.37**	**0.16**
Socially isolated	**-0.32**	**0.07**	**-0.33**	**0.08**
Traditional	**-0.12**	**0.05**	**-0.13**	**0.05**
Integrated	0.01	0.05	0.00	0.05
Instrumental * badly off	*-0.27*	*0.16*	-0.23	0.17
Emotionally isol * badly off	**-1.15**	**0.30**	**-1.04**	**0.32**
Social isolated * badly off	0.13	0.16	0.19	0.16
Traditional * badly off	-0.18	0.11	-0.07	0.12
Integrated * badly off	*-0.22*	*0.12*	**-0.19**	**0.12**
Instrumental * well off	*-0.28*	*0.16*	*-0.30*	*0.17*
Emotionally isol * well off	-0.18	0.35	-0.28	0.37
Social isolated * well off	0.22	0.15	0.18	0.16
Traditional * well off	-0.12	0.10	*-0.19*	*0.11*
Integrated * well off	-0.10	0.10	-0.12	0.11
Instrumental * income			0.06	0.11
Emotionally isolated * inc			**0.25**	**0.26**
Socially isolated * income			0.10	0.11
Traditional * income			**0.17**	**0.07**
Integrated * income			0.05	0.07
Constant	**5.43**	**0.06**	**5.44**	**0.06**

Random Intercepts	**var**	**SE**	**ICC**	**var**	**SE**	**ICC**
Level 3: MSOA	0.02	0.01	**1.3%**	0.02	0.01	**1.2%**
Level 2: Household	0.28	0.03	**19.3%**	0.28	0.03	**19.2%**
Level 1: Individuals	1.17	0.03	**79.5%**	1.17	0.03	**79.5%**

AIC	25475.9	25477.24
Log likelihood	-12713.9	-12709.62
Log Likelihood base	-12728.02	
-2 LLR test	28.24*(signif at 10 df)	36.8* (signif at 15df)

Table 7.5 Three-level random intercepts models testing the effect of relative income position by connectedness; coefficients in bold are significant at p > 0.05, those in italics are borderline significant at p >0.1

7.4.3 Financial situation

The models exploring the main effects on perceived financial situation are shown in Table 7.6. Model 4A shows the effects of area-level explanatory variables and shows that average income has a large and positive effect on how personal finances are perceived (b = 0.76, SE = 0.10), as does being relatively well off (b = 0.38, SE = 0.03). Being relatively badly off has a negative effect (b = -0.29, SE = 0.03), as does the proportion of deprived homes in the neighbourhood (b= -0.03, SE = 0.01). The addition of these variables reduces the proportional error at the higher levels substantially; the PRE at level 3 is 37% and for level 2 is 10%. Once household income is introduced into Model 4B, the effect of area income (0.28, SE = 0.11) and being better off than the neighbours (b = 0.20, SE = 0.04) are substantially reduced, while the effect of being worse off than the neighbours drops and is no longer statistically significant. Household income has a significant and positive effect on how one's financial situation is perceived (b = 0.24, SE = 0.02). The PRE at level 2 is 4% compared to Model 4A. Connectedness is added to Model 4C; here it is evident that there are differences in the perception of financial circumstances by network type, independent of household and area income. There is a significant effect of having a traditional network (b = -0.13, SE = 0.03) and being socially isolated (b = -0.12, SE = 0.03) as well as a borderline effect of being emotionally isolated (b = -0.14, SE 0.08). When compared to the civic-minded, people with these network types therefore have a general tendency to rate their financial situation less favourably, even when personal income and area characteristics are controlled.

The interaction terms are added to the model and are reported in Table 7.7, firstly without (Model 5A) and then with (5B) income interactions as controls. In both models there is strong evidence that relative income position has different effects depending upon patterns of social ties. The coefficients for the well-off interactions are negative for all; they are statistically significant for the socially isolated, traditional, and integrated and of borderline significance for the instrumental. The main effect, representing the effect for the civic-minded, of being well off compared to others, is 0.36 (SE = 0.07), an effect largely annulled by being socially isolated (b = -0.31, SE = .11) and substantially reduced for the others who have coefficients between -0.21 to -0.19. Overall it seems that the civic-minded have enhanced life satisfaction from when their income level is higher than that of others in the area; through their expansive networks they are in a position to appreciate how well off they are and accordingly will appraise their finances more positively. Conversely, there does not seem to be any influence of connectedness on the effect of being badly off. The log likelihood ratio test which compares the saturated model 5A to model 4C produces a test statistic of 15.06 which at 10 degrees of

freedom is not significant at the 95% level; it must therefore be acknowledged that in this instance that the addition of interaction terms does not improve the fit of the model. However, the comparison between model 5B and 4C does produce a statistically significant test statistic and indicates the goodness of fit to be significantly better where interactions for income are included alongside interactions for relative income position.

Financial situation	Model 4A			Model 4B			Model 4C		
Fixed part of model	**b**	**SE**		**b**	**SE**		**b**	**SE**	
Area income	**0.76**	**0.10**		**0.28**	**0.11**		**0.27**	**0.11**	
Relatively badly off	**-0.29**	**0.03**		-0.06	0.04		-0.06	0.04	
Relatively well off	**0.38**	**0.03**		**0.20**	**0.04**		**0.20**	**0.04**	
Deprived homes in area	**-0.03**	**0.01**		**-0.03**	**0.01**		**-0.03**	**0.01**	
Household income				**0.24**	**0.02**		**0.24**	**0.02**	
Instrumental							-0.01	0.04	
Emotionally isolated							*-0.14*	*0.08*	
Socially isolated							**-0.12**	**0.04**	
Traditional							**-0.13**	**0.03**	
Integrated							*-0.05*	*0.03*	
Constant	**3.08**	**0.03**		**3.05**	**0.03**		**3.12**	**0.04**	
Random Intercepts	**var**	**SE**	**ICC**	**var**	**SE**	**ICC**	**var**	**SE**	**ICC**
Level 3: MSOA	0.03	0.01	**3.2%**	0.02	0.01	**2.8%**	0.02	0.01	**2.7%**
Level 2: Household	0.35	0.02	**41.9%**	0.34	0.02	**41.0%**	0.33	0.02	**40.9%**
Level 1: Individuals	0.46	0.01	**55.0%**	0.46	0.01	**56.2%**	0.46	0.01	**56.4%**
Log likelihood	-10234.05			-10183.97			-10170.93		
AIC	20484.1			20385.93			20369.86		

Table 7.6 Three-level random intercepts models of perceived financial situation; coefficients in bold are significant at p > 0.05, those in italics are borderline significant at p >0.1

The controls are added to Model 5A in the same order as for life satisfaction and these are reported in tables A3.1, A3.2 and A3.4. The addition of region as a control, firstly, does not influence the results at all. One region has a significant and negative effect on financial situation which is the South West of England (b = -.13, SE = 0.05), and the level 3 ICC is reduced to 1.1% suggesting that, unlike life satisfaction, region does exert a small impact on subjective appraisals of finances. Secondly, the household level controls do weaken the findings slightly. The social isolation and well off interaction drops to borderline significance, and instrumental interaction to non-significance. The traditional/ integrated effects remain robust. This weakening of effects suggests that household circumstances may influence the observed pattern to some degree. Being a home owner improves perceptions of financial situation,

while having difficulties paying for housing, unsurprisingly, has a strong negative effect. The ICC at household level is reduced to 37% with these controls added.

Financial situation	Model 5A		Model 5B	
Fixed part of model	**b**	**SE**	**B**	**SE**
Area income (centred)	**0.27**	**0.11**	**0.27**	**0.11**
Relatively badly off	-0.07	0.07	-0.10	0.08
Relatively well off	**0.35**	**0.07**	**0.36**	**0.07**
Deprived homes in n'hood	**-0.03**	**0.01**	**-0.03**	**0.01**
Household Income (centred)	**0.24**	**0.02**	**0.19**	**0.04**
Instrumental	0.02	0.06	0.02	0.06
Emotionally isolated	-0.12	0.10	-0.09	0.10
Socially isolated	-0.06	0.05	-0.05	0.05
Traditional	**-0.10**	**0.04**	**-0.11**	**0.04**
Integrated	0.00	0.04	0.00	0.04
Instrumental * badly off	0.04	0.11	0.07	0.12
Emotionally isol * badly off	0.06	0.19	0.15	0.19
Social isolated * badly off	-0.08	0.11	-0.02	0.11
Traditional * badly off	0.08	0.08	0.13	0.09
Integrated * badly off	-0.06	0.08	-0.07	0.09
Instrumental * well off	*-0.19*	*0.11*	*-0.21*	*0.11*
Emotionally isol * well off	-0.12	0.23	-0.22	0.24
Social isolated * well off	**-0.23**	**0.11**	**-0.31**	**0.11**
Traditional * well off	**-0.16**	**0.07**	**-0.20**	**0.07**
Integrated * well off	**-0.20**	**0.07**	**-0.19**	**0.07**
Instrumental * income			0.05	0.08
Emotionally isolated * inc			0.21	0.16
Socially isolated * income			*0.15*	*0.08*
Traditional * income			*0.08*	*0.05*
Integrated * income			-0.01	0.05
Constant	**3.08**	**0.04**	**3.09**	**0.04**

Random Intercepts	**var**	**SE**	**ICC**	**Var**	**SE**	**ICC**
Level 3: MSOA	0.02	0.01	2.7%	0.02	0.01	2.7%
Level 2: Household	0.33	0.02	41.1%	0.33	0.02	41.1%
Level 1: Individuals	0.46	0.01	56.2%	0.46	0.01	56.2%
AIC	20374.9			20373.85		
Log likelihood	-10163.4			-10157.92		
Log likelihood base	-10170.93					
-2 LLR test	15.06 (10 df, non-signif)			26.02* (signif at 15 df)		

Table 7.7 Three-level random intercepts models testing relative income position by connectedness; coefficients in bold are significant at p > 0.05, those in italics are borderline significant at p >0.1

Finally, individual-level controls are added (A3.4). The well-off interactions remain similar in coefficient size and significance to Model 5A in the presence of socio-demographic controls. As for life satisfaction, personality and prior satisfaction weaken the effects, with social isolation and traditional interactions with well-off dropping in significance. Despite the weakening of effect, no single control explains the connectedness-comparison differentials completely. Personality and prior happiness appear to have larger influence in explaining away the effects of the isolated classes than others.

7.4.4 Marginal effects

The results are illustrated by plotting marginal effects from models 3A for life satisfaction, and 5A for financial situation. In both cases, area income and household income are held at the median, though a slightly unrealistic scenario, it means the marginal effects represent just those relating to social comparison and can be interpreted as an average effect at all levels of income. Non-significant results are shown in dashed lines. Figure 7.1, firstly, demonstrates quite clearly the size of the relative income effect for the life satisfaction of the emotionally isolated; the remaining five connectedness types look to have fairly flat lines in comparison. Figure 7.2 shows the additional boost that the civic-minded get to their perceived financial situation when well off compared to their neighbours, this being a far steeper jump than the rest. The non-monotonic shape of the relationship is clearly visible in both. The effect is not equal or linear, but differs greatly by the relative position in combination with connectedness.

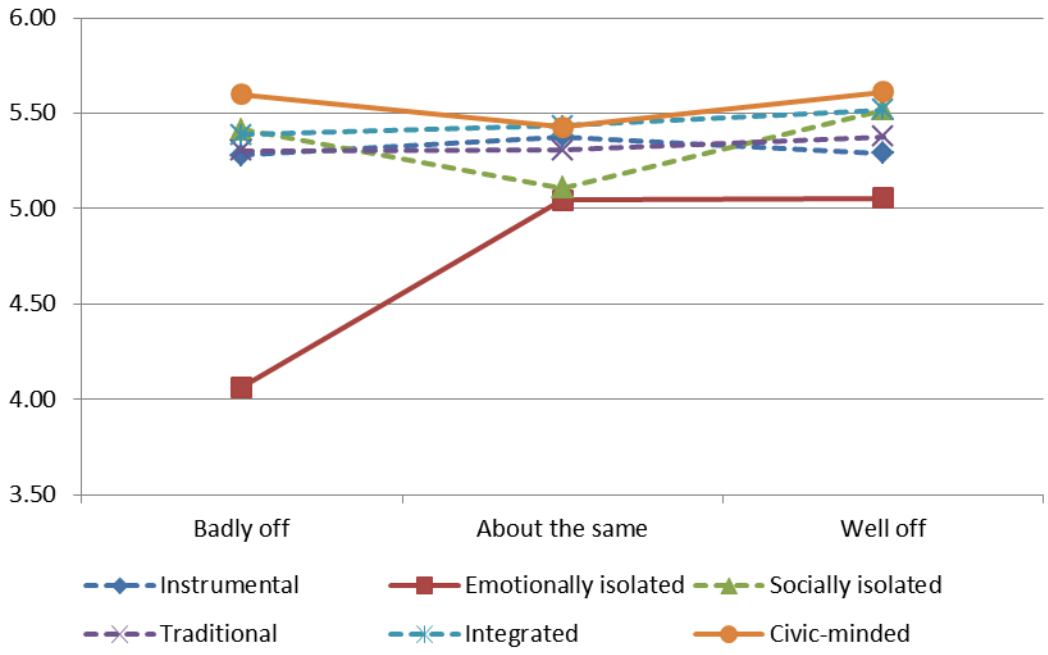


Figure 7.1 Life satisfaction, marginal effects based on Model 3A

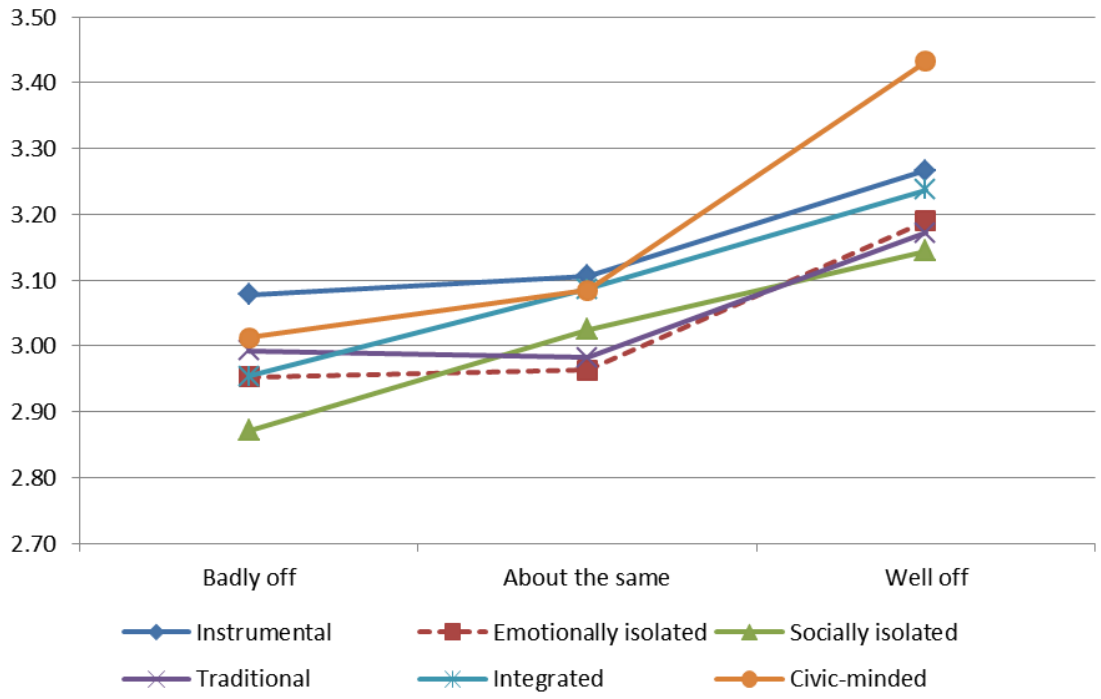


Figure 7.2 Financial situation, marginal effects based on Model 5A

7.4.5 Robustness checks and sensitivity analysis

The construction of the well off and badly off variables used a cut-off point between household income and neighbourhood income of more than one quintile's difference. This is to say that if an individual is poorer or richer than their neighbours but just by a small amount (less than the span of one quintile) then they were classified as 'about the same' which was taken as the reference category. To understand if this cut-off point has biased the results in any way, a sensitivity analysis was carried out so that the same models were examined with the variables generated with new cut-offs. This helps to determine the robustness of the findings and the degree to which the size of the income gap matters.

Firstly, the well off and badly off categories were widened to include any difference including of just one quintile, so that the only cases falling into the reference category include those whose household income is in the same quintile as the average income in their local area. This coding means that many more in the sample are classified as well off (43%) or badly off (32%). The findings with this new version of the relative income variable are weaker. The emotionally isolated still have lower life satisfaction when badly off, but the effect is weaker (b = -0.55, SE = 0.10). For the effect on financial situation, none of the connectedness interactions are now significant. This suggests that small income differences are less relevant for appraisals.

Model 3A with alternative relative income variables			
Fixed part of model	**b**	**SE**	
Area income (centred)	0.09	0.10	
Relatively badly off (> 2 quintile)	**-0.21**	**0.10**	
Relatively well off (> 2 quintile)	**0.27**	**0.09**	
Deprived homes in n'hood	**-0.02**	**0.01**	
Household Income (centred)	**0.28**	**0.02**	
Instrumental	-0.03	0.05	
Emotionally isolated	*-0.16*	*0.08*	
Socially isolated	**-0.13**	**0.04**	
Traditional	**-0.13**	**0.03**	
Integrated	-0.03	0.03	
Instrumental * badly off	**0.31**	**0.15**	
Emotionally isol * badly off	0.34	0.23	
Social isolated * badly off	0.24	0.16	
Traditional * badly off	**0.29**	**0.11**	
Integrated * badly off	0.03	0.12	
Instrumental * well off	-0.06	0.15	
Emotionally isol * well off	-0.20	0.44	
Social isolated * well off	-0.17	0.15	
Traditional * well off	*-0.18*	*0.10*	
Integrated * well off	**-0.23**	**0.10**	
Constant	**3.13**	**0.04**	
Random Intercepts	**var**	**SE**	**ICC**
Level 3: MSOA	0.02	0.01	2.7%
Level 2: Household	0.34	0.02	41.2%
Level 1: Individuals	0.46	0.01	56.2%
Log likelihood	-10172.74		
AIC	20393.47		

Table 7.8 Model 3A with alternative relative income measures; dependent variable is financial situation

Secondly, the well off and badly off variables are narrowed to include only cases where a 3 or 4 quintile gap exists between household and area income and thus represent the effects of relative income across a larger economic divide. To illustrate, being badly off by this measure means that household income is on average £313 lower per week than the neighbourhood average. This is compared to a £220 average gap based on a 2-quintile gap. Fewer cases fall into the relative income categories here with just 7% being badly off and 9% being well off. With the variables constructed in this way, the findings are similar in that it is only the emotionally isolated whose life satisfaction suffers from living in an area with an average income much higher than personal income. However, using this new measure it appears that

the civic-minded experience *worse* outcomes when worse off than the neighbours compared to others when rating their financial situation. The results are shown in Table 7.8. The main effect is -0.21 (SE = 0.10) and the interactions are similar in absolute size, positive, and significant for the instrumental and traditional. This finding is somewhat contradictory to the main models, and suggests that as predicted by the exposure hypothesis, having more social interaction in the local area brings about greater effects from being worse off as well as being better off. This appears the case where the difference in incomes is large, but not where the difference is moderate.

Further robustness checks include re-running the models with the low income observations removed from the sample to check that the observed results, particularly relating to the emotionally isolated do not stem from extreme low income or need. Here, the check is applied to both household income (tables A3.5 and A3.6 in the appendix) and MSOA income (A3.7 and A3.8). The cut-offs applied are the 25th percentile so that the lowest quarter of observations is dropped, and separately the 5th percentile so that potential measurement error is minimised but low earners retained. In both cases, the findings are robust to this check, which is to say that all statistically significant findings reported in the analysis section hold firm. In fact, as we have seen in prior chapters, the findings seem to strengthen with low income removed, with several of the 'badly off' interactions becoming statistically significant lending further support to the distinct pattern of the civic-minded being protected from the negative effects of relative income position where the gap is not too large. As a final check, I fitted models 3A, 3B, 5A and 5B again with the reduced sample available from the models with controls. There are no changes to the results.

7.5 Limitations

People are not randomly allocated into neighbourhoods, and it has not been possible to rule out the self-selection effect in this analysis. This is perhaps particularly salient for downward comparison as it is difficult to imagine that individuals would self-select into an area that makes them feel bad, such as the badly off emotionally isolated. However, it is feasible that the civic-minded, rather than experiencing more downward comparison, have moved into neighbourhoods in which they will feel happy. Longitudinal analysis that explores changes in the individual-area income relationship, either through changing circumstances or through residential mobility, would be necessary to rule out the possibility of self-selection as cause.

A second limitation is that the data do not include variables that allow us to further explore the proposed mechanisms at work, the most important of which being self-esteem in its 'inner'

and ‘outer’ forms. We have, however, ruled out dispositional happiness as the cause, and the big five personality traits. An avenue for further research could involve the examination of precise psychological mechanisms. The research would also be fruitfully expanded by exploring other, perhaps more salient, reference groups such as colleagues. It would also be beneficial to understanding the processes at work by searching for thresholds in the size of the income gap that individuals with certain levels of psychological resources would be able to withstand before feeling the negative effect.

A further limitation may relate to the effects of comparison for those at high incomes. The ranges of income present in the top quintile of both income measures may mean that it is possible to be categorised as living in an situation classified as “about the same” but where household income is, nonetheless, substantially below that of the neighbours. In this case, the measurement schema may be letting real comparison opportunities slip through the net. In this regard, however, this potential weakness may simply be reflecting that, as elsewhere, income scales and percentiles are inadequate measures by which to examine the well-off.

A fourth limitation is that, despite showing that the size of the gap matters, this analysis has not addressed inequality per se. It may be a worthy extension to this analysis to examine the effects of inequality in areas; the variance of MSOA income may be as important as the median for exploring the negative consequences of social comparison.

The data are modelled without weights for the reason that the sampling weights provided by ISER for the BHPS data adjust for unequal sampling probabilities due to geographical clustering and therefore, to some extent perform the same function as the multilevel model (Snijders and Bosker 2009). By not applying weights, the results may be biased by non-response at the household level which is corrected in the BHPS weighting. Nonetheless, as many of the factors predictive of non-response (see Chapter 3) are included as controls, any risk to the accuracy of the results is minimal. A further limitation is that the models including connectedness do not explain much additional variance, so the effect of the explanatory variables must be acknowledged to be small. However, this level of variance explained is customary in research on subjective well-being which proves hard to predict. The AICs support the fact that the models with connectedness are better fitting than those without.

7.6 Summary and conclusions

This chapter has explored the role of the local area as a stressor and the protective function of connectedness as a buffer against the potentially negative forces of social comparison. Despite what some consider 'universality' in the desire to learn about the self through comparison, this analysis suggests that the effect of a given reference group plays out differently according to the social and psychological resources of the individual.

The connectedness-comparison relationship is less than straightforward, firstly, because it is not symmetrical with respect to the direction of the comparison. The civic-minded group engage in more downward comparison than everyone else, presumably because of the substantial range of social interactions with other residents in the area, they get chance to appreciate how difficult other people's lives are, and therefore have a sense of how well off they are. They do not, on the other hand, have an equivalent negative reaction when the direction of comparison is upward, at least where the gap in income is moderate. The literature suggests the reasons for this include the inner self-esteem and feelings of control, purpose and worth that are derived from the wide and active social ties which override the need for comparison. Coming back to Festinger's (1954) assertion that comparison is more necessary where there is a lack of other appraisal information, we might suppose that the positive 'self-concepts' forge a source of appraisal information that diminishes the need to look towards others. A second way in which the civic-minded can avoid having their well-being pulled down by being surrounded by richer others is that their network is wide enough to include others 'in the same boat' or perhaps worse off in other, non-financial, ways. This reach to similar others provides an opportunity for threat appraisal (Thoits 2011). In this explanation it would appear that the individual rejects the larger reference group and chooses a point of reference that allows the psychological costs of comparison to be avoided (Falk and Knell 2004; Brickman and Bulman 1977).

Also demonstrating asymmetrical comparison behaviour are the emotionally isolated. Evidence showing that increased contact with the reference group increases the comparison effect (Stutzer 2004) would predict that social isolation might protect against comparison. However, this is not the case with the emotionally isolated, who, in spite of their small networks, engage in more upward comparison than any other connectedness group. They do not, in the opposite scenario, engage in more downward comparison. In Stutzer's study contact with neighbours was a binary variable; quite unlike the measurement schema here which takes account of social support and voluntary associations. There may be scope for future studies to explore more precisely the role of type of contact. Although the theory on

self-esteem and social comparison might suggest that low self-esteem would result in more comparison overall (Gecas and Schwalbe 1983), the findings here agree with Wayment and Taylor (1995) who demonstrated increased upward comparison. Chapter Six highlighted that the emotionally isolated cared more about money before they became isolated. It seems likely, therefore, that they have low self-esteem and/ or are more materialistic, which explains both the comparison patterns and the state of isolation.

These asymmetrical patterns of comparison support the idea that upward and downward comparison should be empirically separated. The large body of work in which the stressor is considered as a single continuous variable (e.g. Stutzer 2004; Firebaugh and Schroeder 2009; Luttmer 2005; Wolbring et al. 2011) may be misrepresenting what is in fact a non-linear relationship.

Further evidence that the stressor has non-linear effects is provided in the sensitivity analysis which demonstrates that whether the comparison group exerts an influence or not depends upon the size of the income gap. When the definition of "badly off" is narrowed to having household income 3 or 4 quintiles below the average neighbourhood income, the results change. People with civic-minded network types in this situation have a greater cost to their well-being than any other type of connectedness.

When the well-connected are not doing well financially, they manage to maintain better life satisfaction than everyone else (Chapter Five), and this in spite of their increased opportunity for comparison. This paradox has been somewhat unravelled by this analysis; it seems they refrain from upward comparison, at least when the income gap is not too large. In general, we can conclude that having a civic-minded network type brings benefits to SWB in almost any situation, with the exception that in very dissonant economic contexts where the social ties to much richer people are detrimental.

In the preceding chapters, the resilience of the integrated has been shown to be close to that of the civic-minded in many cases. The similarity between them was considered unsurprising as the networks types are similar expect for the extent of organisational activity. The results here suggest otherwise; having ties to several organisations produces outcomes that are substantively different to activity with just one. The effect of downward comparison on perceived financial situation appeared similar in magnitude to all other groups, including the integrated, when compared to the civic-minded. This may suggest that a threshold effect is at

work, or that a minimum economic diversity is required in the social circle to bring about this increased downward comparison effect.

A further puzzle that this section set out to explain was that individuals who became civic-minded saw a shift in the income needed for life satisfaction but no change in the effect of perceived financial situation. The proposed reason for the inconsistent finding was that once an individual has moved from a less well-connected group into civic-minded, they are not only in a position to displace the role of money in their lives, but also are able to appraise their financial circumstances more positively. This analysis has provided support for this idea; as a main effect, the civic-minded are more positive than those with traditional or socially isolated networks, once income and area characteristics are accounted for. They also appraise much more positively while in a position of downward comparison and can withstand a moderate upward income gap with no costs to how they perceive their situation. This support for the hypothesis that the civic-minded appraise more positively also extends the evidence from the previous chapter for the role of connectedness itself, not just the psychological factors that predispose individuals towards social activity.

Chapter 8. Conclusion

The findings can be summarised thus: people who have both strong and weak ties are more resilient to financial stress, in that their subjective well-being suffers less at these times in comparison to those with just one type of tie or neither. They maintain high levels of satisfaction at all levels of household income, and are likely to appraise their financial situation more positively. In part, this is because the extensive ties out into the community are associated with a boost to satisfaction from being better off than those living close by, suggesting that having social interactions with a wide circle of others has the capacity to make you realise how well-off you are. On the other hand, it is the isolated who suffer the biggest cost to their subjective well-being if they are worse off financially to their neighbours. The cost to satisfaction is substantial and shows that isolation should not be interpreted as a lack of knowledge of others; people lacking emotional confidants and friends continue to look to the lives of others even without the existence of ties between them. Further, it was shown that resilience has the capacity to change with connectedness, and therefore is not a spurious finding that can be explained away by features of the individual. Connectedness itself exerts an influence on SWB and resilience.

8.1 How the conclusions were reached

These conclusions were reached after an extensive secondary analysis of a large and nationally representative data set, the BHPS, which is of high quality and offers the main advantage of panel data, namely that the effects of the explanatory variables can be separated from the effects of the person. These data provided a set of measures of social connectedness that enabled a latent variable approach to determine type of connectedness. The 'types' of connectedness were determined largely from attention to the literature which highlighted the benefits of weak and strong ties, the negative consequences of social isolation and the advantage of social integration.

Once the measurement schema was established, it was used as an explanatory variable in three empirical chapters exploring the money-happiness relationship and resilience to financial stress. The first of these, Chapter Five, took a subsample of individuals whose connectedness had remained unchanged, and pooled seven waves of data to ensure that there was individual variation in subjective and objective income measures and in feeling better or worse off in comparison to previous years. The hypotheses were tested by the introduction of interaction terms of the stressor (financial stress, income) and the resilience resource (connectedness)

into the model. The interaction terms revealed statistically significant differences in the degree to which financial matters influence life satisfaction.

Chapter Six set out to show that resilience changes when connectedness changes, thus offering support for the theorised mechanism and ruling out unmeasured traits of the person as a confounding factor. It did this by comparing resilience before and after a change in connectedness and revealed robust effects, particularly that income becomes less important for happiness after an expansion to the social network. The chapter concluded that the findings were slightly puzzling in that after taking into account changes in connectedness, the connectedness-resilience relationship was robust to the objective measure of household income, while the subjective measures did not change their influence on outcomes. To unravel this contradiction, the final empirical chapter included an analysis of appraisals of financial circumstances in addition to life satisfaction. Chapter Seven measured the effects of income relative to others in the local neighbourhood by calculating the gap between household and area income, and testing how this gap influences appraisals of satisfaction and finances.

8.2 Summarising the empirical findings

Selected findings from Chapter Five and Chapter Seven are summarised in Figure 8.1 and 8.2. Both show predicted levels of life satisfaction based on the protective factor models, which is to say that the estimates are calculated from the interaction terms as well as the simple effects. The first, Figure 8.1, compares the effects of the more objective measures of the financial situation, namely household and local area income. The 1st and 99th percentiles of income are used to predict satisfaction, as well as being well-off or badly-off relative to the area average. Figure 8.2 shows the subjective measures. The stressors are shown in red while positive financial circumstances are shown in green. It is evident in Figure 8.1 that there is greater variation by either measure under the condition of financial stress than when things are going well. The civic-minded with both strong and weak ties consistently stood apart from the other network types throughout the empirical chapters. It is well exemplified by the clustering of life satisfaction predictions which are between 5.4 and 5.6 regardless of the circumstances. This pattern of 'clustering' can be interpreted as low volatility and directly relates to the degree of resilience. For this group financial difficulties have a small cost to life satisfaction. The resilient clustering pattern is also seen, to a lesser degree, among the integrated whose satisfaction remains between 5.2 and 5.5 regardless of the situation. The satisfaction gap between the positive and negative circumstances begins to widen a little along the axis of the traditional who have a satisfaction score of 4.9 at low incomes compared to 5.4 when they are better off than their neighbours.

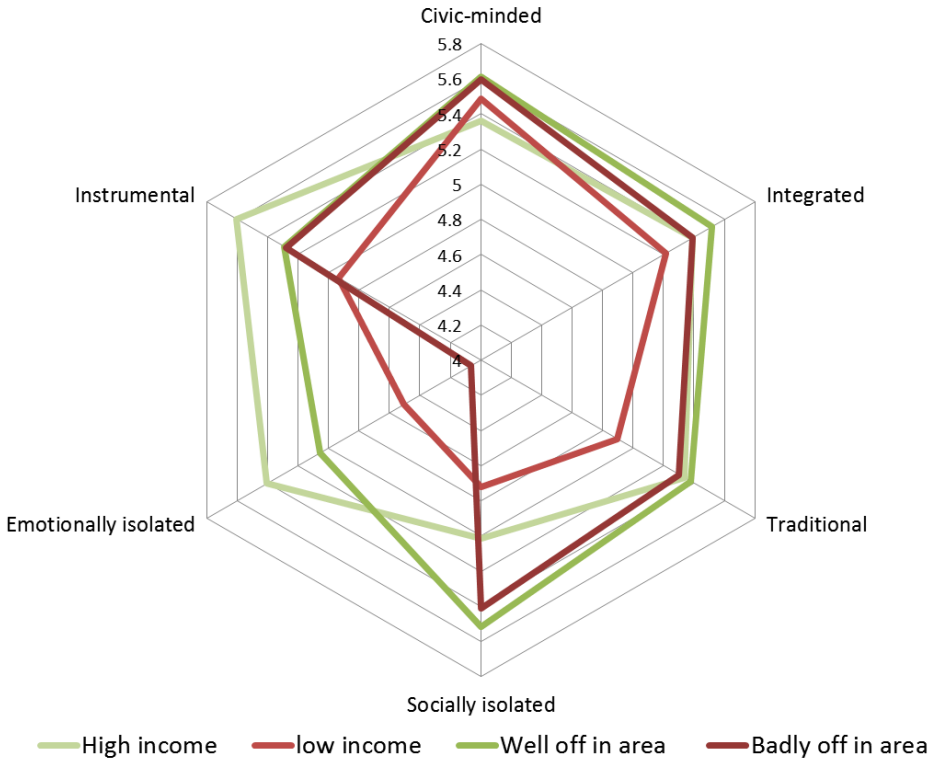


Figure 8.1 Predicted life satisfaction in 'good' (green) and 'bad' (red) situations; based on objective income measures (models shown in Chapters Five and Seven, Tables 5.12 and 7.5)

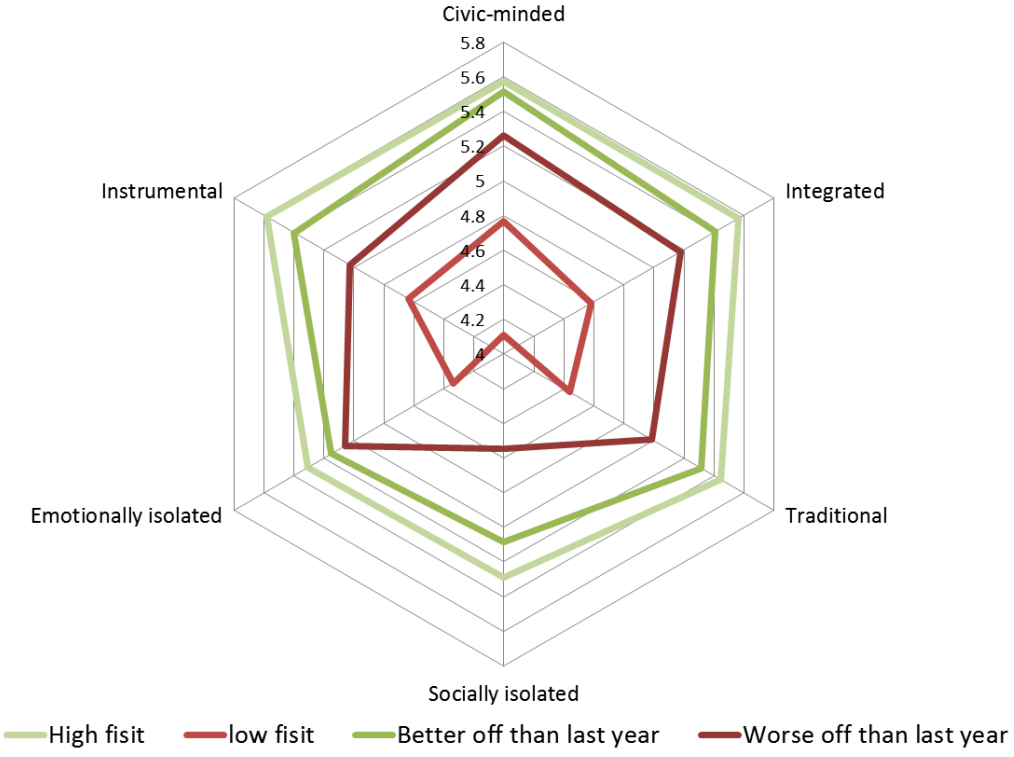


Figure 8.2 Predicted life satisfaction in 'good' (green) and 'bad' (red) situations; based on subjective measures (models shown in Chapters Five and Seven, tables 5.9 and 5.10)

Bigger gaps, however, are seen among the isolated classes, particularly the emotionally isolated where the gap between the green and red lines is more than a full point of satisfaction. The contrast between the socially and emotionally isolated is illustrated here; the socially isolated experience no negative consequences of being poor compared to their neighbours, while this brings about a large negative effect for the emotionally isolated. All three of the more isolated classes have greater losses to their satisfaction from low income than others.

Figure 8.2 shows a 'cleaner' pattern in that the red lines fall within the green in all cases. In most cases, the negative effect of the stressors is stronger than the objective stressors shown in Figure 8.1. This reflects the analysis in Chapter Seven that showed endogeneity of subjective appraisals, that is, the perceptions and appraisals themselves vary considerably by connectedness. Despite the differences, the subjective measures follow the same basic pattern as the objective in that there is greater variation at times of stress than otherwise. Connectedness matters more when things are not going well than when they are[30].

The civic-minded are the least affected by money; there is no effect of household income on their satisfaction, and the effect of subjectively rated financial situation or from being worse off in comparison to the previous year has a smaller negative impact than for the other groups. The civic-minded are more resilient than the closely related integrated group indicating that an extensive range of organisation-based social activity leads to better outcomes than just one. Those with ties to organisations but having a restricted network of close ties do not experience good outcomes. Income makes a greater contribution to the satisfaction of those in this mixed type of network, and under the stress of being worse off than the previous year they are less resilient than those with traditional networks. This underscores the fact that the benefit of weak ties comes only when they are in addition to a solid foundation of supportive strong ties, accurately considered to be a "necessary condition" for happiness (Diener and Biswas-Diener 2008).

Unlike much of the research around social capital and social connectedness, this study had the benefit of using longitudinal data, providing a means to empirically separate the effect of social connectedness from unmeasured traits of the individual. The analysis showed that connectedness itself, not just personality or other stable characteristics, is at least partially responsible for the resilience to financial circumstances. Equally, through a series of

[30] The charts include the estimated satisfaction levels even where the protective factor coefficients were non-significant. Therefore, some patterns look surprising, such as the emotionally isolated who appear to enjoy feeling worse off compared to last year and the socially isolated who appear to gain from both living in an area where they are comparatively well- or badly-off.

robustness checks, resource-based explanations, for example, that the benefits come from material resources provided by social ties, are also shown to be an unlikely cause of the observed protective effect of social ties. A summary of the hypotheses is shown in Table 8.1.

#	Hypothesis	Status
H1	**The SWB gap between connectedness types will be greater under conditions of financial stress and narrower when things are going well.**	**Supported**
H1.1	The interaction terms of connectedness with income and with subjective financial situation will be positive compared to the reference category of civic-minded	Supported
H1.2	The interaction terms with the stressor 'worse off' will be negative	Partially supported
H1.3	The magnitude of effect will be largest for the emotionally isolated, followed by the socially isolated. Traditional and instrumental classes will have more moderate differences while the smallest gap will be evident for the integrated.	Partially supported
H2	**Changes in connectedness will bring about changes in subjective well-being and in resilience.**	**Partially supported**
H2.1	For those who transition into a civic-minded or other more-connected network type, money will have a reduced effect on life satisfaction, compared to before.	Largely supported
H2.2	For those who transition into emotionally isolation or other less-connected network type, money will have an increased effect on life satisfaction, compared to before.	Not supported
H3	**The well-connected will be protected from the negative effects of being worse off while the isolated will not be.**	**Partially supported**
H3.1	The civic-minded will have greater gains to their life satisfaction when relatively well-off compared to the neighbours.	Not supported
H3.2	The emotionally isolated will suffer higher costs to their life satisfaction when worse off than the neighbours.	Supported
H3.3	Appraisals of financial situations vary by social connectedness, with the better-connected being more positive than the socially isolated.	Partially supported
H3.4	The civic-minded will have greater gains to their perceived financial situation from being better off than the neighbours	Partially supported
H3.5	The emotionally isolated will suffer higher costs to their perceived financial situation from being worse off	Not supported

Table 8.1 A summary of hypotheses and their status; over-arching hypotheses are in bold

8.3 Linking the findings to theory

8.3.1 The money-happiness relationship

This study has confirmed the assertion that money does not bring about satisfaction in a direct and casual way (Layard 1981; Boyce et al. 2010; Easterlin 2003). The essential finding is that the size of effect is different across groups of individuals classified according to their social networks, including a group for whom household income has zero effect on their satisfaction. As this holds true even controlling for severe financial hardship, and when excluding those on low incomes, it suggests that the mechanism cannot be direct and causal. This is an addition to a small but important literature showing that the money-happiness relationship is mediated by other aspects of life including personal values and aspirations (Kasser and Ryan 1993; Nickerson et al. 2003), religion (Lelkes 2006), and political orientation (Di Tella and MacCulloch 1999).

The direct and causal mechanism is defended in work showing that absolute income makes a better predictor of happiness than relative income. The absolute versus relative debate is still alive with recent contributions from Boyce et al. (2010), on the one hand, showing that ranked income is a better predictor than absolute income in a model of life satisfaction and that adding absolute income to the model does not account for any additional variance. On the other hand, Wolfers et al. (2013) show that average country satisfaction has a linear relationship with the log of income, and country-year averages of growth in GDP and satisfaction have a linear relationship. The authors conclude, therefore, that absolute income must matter.

The analysis in this thesis has demonstrated the importance of the average income of those living close by, and therefore that the relative income hypothesis cannot be rejected. However, absolute income may contribute to SWB where the individual is isolated, or prioritises material goals, two factors that may well be connected as shown in Chapter Six. Consumption is likely to function as an alternative means to engage in the social world around, and to feel a sense of worth for those not gaining such benefits from their social ties. The socially isolated provide an interesting example; their happiness increases by more than average with household income, but they appear completely resilient to relative income effects, perhaps they are socially 'aloof' rather than isolated. This pattern of results implies that relative income is not a contributor of satisfaction to this group, which in turn suggests that neither absolute nor relative income can always explain happiness; they may both matter, as do perceptions. However, despite being unable to reject the absolute income hypothesis, the direct and causal mechanism is not

supported while such variation between groups is evident. The psychological benefits mechanism may prove to be the only framework that can explain the results. Income is a sign of regard in itself even when not comparing to others.

8.3.1.1 Social comparison

In general, the findings have supported the results of earlier studies of social comparison (such as Luttmer 2005; Blanchflower and Oswald 2004; Shields et al. 2009; Stuzer 2004) in that individuals notice the riches of those living close to them, and that the more those co-inhabitants earn, the lower personal satisfaction becomes. However, Chapter Seven's results emphasised the need for a more nuanced approach. Firstly, the degree of comparison may vary systematically by connectedness, or the degree of psychological resources available. 'Resilience' was described by Zautra et al. (2010) as "the *ability* to see the silver lining" (p. 4, emphasis added). While this sounds rather elusive and difficult to measure, the findings here suggest that individuals need the *opportunity* to see the silver lining, and that that is a measurable and real effect. Secondly, the direction of comparison may be asymmetrical with some individuals able to benefit from downward comparison whilst avoiding the costs of upward comparison, but others overwhelmingly feel the negative effects. This supports previous work showing that people with low self-esteem are more prone to compare upwards (Wayment and Taylor 1995). Thirdly, the effect of neighbourhood income is non-linear; income gaps can be ignored more easily when they are moderate, but even those with the most psychological resources are susceptible to negative effects of big disparities in income. Just how large a gap can be tolerated before psychological costs are incurred is a subject worthy of further study.

The effect of connectedness on social comparison is contradictory to the studies that have found social interaction in the neighbourhood increases the degree to which relative income position matters (Stutzer 2004; Luttmer 2005). The disparate findings may be explained by further examination of asymmetrical opportunities for comparison, and by accounting for further features of social networks or psychological resources among those who mix with their neighbours. For the moment, however, this remains an inconsistency that needs further examination to be unravelled.

The "Easterlin Paradox" was a critical turning point in the economics of happiness as it showed us that increasing the wealth of a country does not increase the average happiness of the people living in it. This, along with much of the research on social comparison and relative income might suggest that one person's gain in happiness comes at the necessary price of

another's. The positional goods hypothesis (Hirsch 1977), for example, is often interpreted to mean that one individual getting ahead of the crowd comes at a cost to everyone else, and the sum of benefits is inevitably zero. The role of connectedness as demonstrated in this research, on the other hand, suggests that the assumption of happiness as a zero-sum game is mistaken. It provides evidence that certain patterns of social connectedness enable individuals to feel fully satisfied with their lives even when finding things difficult financially and when living surrounded by people somewhat better off than themselves. In short, comparison is not inevitable, nor is consumerism an unavoidable by-product of modern society. However, as the tendency for increased downward comparison falls away when income gaps are large, this work also highlights the role of inequality and suggests that social connectedness is no 'magic bullet' to overcome economic inequalities.

8.3.2 The effect of connectedness on SWB

Thoits (2011) states a case for the role of weak or secondary ties for health and well-being. This thesis offers support for that theory. Secondary ties are relevant as a source of comparison and self-evaluation and as an aid to "rational appraisal" (Jahoda 1982), and multiple roles provide access to wider components of society (Moen et al. 1989). When a financial shock occurs, the socially isolated have worse outcomes, as do the instrumental whose activity with organisations does not provide the same protection in this regard. The differing outcomes for those with weak but no strong ties shows that a network of strong ties may be a foundation to which weak ties can be added for additional SWB, but that weak ties cannot replace strong ties in their protective effects. Indirect effects to SWB should also be considered. The patterns of network change of those starting out as 'instrumental' also suggest that organisations may play a key role as a stepping stone to network expansion. The results also confirm the importance of social support as a buffer against negative consequences of adverse effects. The better SWB and resilience of the civic-minded and the integrated are in line with findings on mortality that showed ties with organisations had benefits over and above informal ties alone (Berkman and Syme 1979).

However, the results provide a point of disagreement with other studies of the effect of ties to organisations on happiness in the UK. Li (2007) showed, using BHPS data, that organisational membership had no effect on life satisfaction. There are a few elements of difference in the analytic approach; Li uses membership rather than activity, and the control for neighbourhood attachment may be competing for variance. In addition, the effect of organisations may be positive if interacted with informal ties as demonstrated through the measurement schema applied in this thesis.

8.3.3 Social capital

In keeping with much of the literature on social capital, the analysis in this thesis has shown that social capital and economic capital are interwoven. The class gradient in social capital is also evident here, and those with greater economic resources have greater chances of being integrated or civic-minded. These groups may have the double benefit of being better off on average but are also more resilient when things are not going so well financially. Resource-based mechanisms may have some explanatory power but as I showed by excluding cases where need is likely, resources that are fungible with economic capital are unlikely to entirely account for the benefits to well-being. There is no doubt that social capital research would benefit from further attention to the mechanisms at work and consideration of psychological factors.

The analysis of connectedness in Chapter Four showed that personality traits have effects similar in magnitude to socio-demographic factors as predictors of social connectedness. Much research in this field is restricted by the measures available, but where possible dispositional factors should be considered. This may be particularly salient with subjective measures such as life satisfaction, satisfaction with neighbourhoods, and social trust. Further, social capital research would also benefit from exploring and explaining the consequences of dynamic aspects of networks. The concept of bridging social capital may be constructive to examine the effects of bridging across economic divides.

8.3.4 Set-point theory

The empirical work in this thesis did not set out to address set-point theory or to determine the degree to which happiness is a stable trait. However, the evidence largely supports Heady and Wearing's (1989) assertion that happiness is both stable and changeable. Low happiness was shown to predict a move to a more isolated network type and high happiness predicts network expansion. This suggests a happiness set-point and endogenous life events, or the role of stable characteristics such as neuroticism and extraversion. It also supports the idea that it is easier for happy people to make new social connections (Diener and Biswas-Diener 2008). However, analysis of the changers also revealed that real changes in satisfaction occur when social networks expand or shrink. Looking at SWB before and after a network change also showed that those who go on to become emotionally isolated had a larger than average effect of income before they transitioned. This pattern may be explained by materialistic values; this link between isolation and a need for money to be happy may not be causal but

resulting from an unmeasured third cause of early socialisation with non-nurturant parents (Kasser et al. 1995).

8.3.5 Resilience

Despite the fact that the term resilience is usually reserved for child psychology, its application in this thesis has shown that it can be advantageously be applied elsewhere with little adjustment to the definition or analytical methods. The 'protective factor' approach is useful for examining differential effects on positive outcomes at times of stress. The trait versus process models discussed in the psychology literature provided a sound basis for examining the mechanisms at work. Social connectedness was shown to be, in part, an 'external' resource, which is to say that it is not entirely dependent upon 'internal' resources such as self-esteem, positive affect, or extraversion. This distinction is particularly important when considering the policy implications of the findings. Individuals may be able to build up their resilience by building up social connectedness if opportunities to do so are available. Like in child psychology the resources required to bring about resilience are not uncommon or out of reach, but "ordinary magic" (Masten 2001).

8.4 Implications for National Well-Being and policy

This research has implications for applications of the National Well-Being measures. The ONS domains of well-being include subjective well-being, social well-being, and material well-being. However, rather than being separate pieces of an ideally constructed total well-being, the findings in this research show that these are intertwined in experience. Attending to single domain measurements as a tool for policy-making runs the risk of attending to the correlates rather than the causes of happiness.

The findings could be taken as supporting the argument that subjective measures are simply too subjective to be useful and susceptible to the problem of adaptive preferences (Teschl et al. 2005). It would be fraught with complications for example, to gauge how much income people should have based upon how much satisfaction can be bought. On the contrary, however, this work has emphasised the benefit of subjective measures as a way of demonstrating inequalities in the experience of stress. This particular advantage of subjective measures also applies to the measure "finding things difficult" which has been taken up by the ONS as one indicator in the material well-being domain. Again, this may be better understood as a way to recognise disparities in the way that financial stress is perceived and experienced, rather than being taken as a reliable indicator of objective conditions.

The analysis of changes in connectedness suggested that having a dependency on material circumstances may predict future social isolation and the root cause may lie in early life. In his campaign to improve the happiness of society by focusing on mental health, Layard (2012b) has suggested that resilience programmes in the school and workplace would be advantageous. Pilot studies in the USA have focused on teaching children to understand the thoughts and feeling of others and were associated with improved outcomes including drug use and anti-social behaviour. The benefits may extend to preventing social isolation in later life and in turn improve resilience to financial stress. The findings of this thesis also imply that there will be unintended consequences of the spending cuts to voluntary associations, local services, local spaces and charities arising from austerity measures. These lost spaces are lost opportunities for social integration and therefore for SWB and resilience, as well as spaces that allow isolated individuals to expand their networks.

There is, perhaps, potential for the findings to mistakenly interpreted as a way of dealing indirectly with economic inequality. On the dangers of social capital research, Wilkinson (2000) has pointed out that: "[n]o doubt it is a popular concept because it holds out the idea that there are costless ways of making society and the economy work better—implying that poor communities can pull themselves up by the boot-straps without extra money" (p. 411). However, this would be a simplistic reading of the headline findings. Low income is a risk factor for social exclusion, and even among those with the greatest psychological resources from their networks, income gaps that are too large are detrimental to SWB. Therefore, if these findings were applied to the question of how best to raise the happiness of as many people as possible, the answer in lies stemming the growth of economic inequality and in addressing the risk factors for social isolation. These might include providing opportunities for social engagement particularly for those who might be socially excluded due to unemployment or long-term illness.

Vulnerability to social isolation shares many risk factors with economic vulnerability, such as having low income, being unemployed or having a long-term illness, or being in a routine occupation. This does not mean that the argument is circular, or that isolation and economic vulnerability are inevitably linked, but that social isolation comes with the double cost of risk of economic vulnerability and greater costs to happiness when hard times do strike. At the same time, the well-connected have a lower risk of experiencing economic hard times, but if they do, then the happiness costs will be lower.

8.5 Limitations and opportunities for future research

8.5.1 Theory and measurement

One of the limitations of this research is that activity with all types of organisation was considered to be equal in terms of their potential to bring psychological benefits that may bring happiness directly or indirectly as a buffer against stressors. The type of organisation has been shown to matter, for example Argyle (2001) describes how activities including dance, music and voluntary work can bring about joy, while involvement in a political organisation may reduce it. Swindells et al. (2013) show that community arts participation brings about 'eudaimonic' well-being, by bringing purpose and encouraging autonomy. Such participation might therefore be expected to exert greater effects on the money-happiness relationship than other activities. Further, Kroll (2014) has noted the variable effects of involvement with organisations and suggests that it may be dependent upon other sources of social approval and self-esteem including meaningful work and raising children. For some, depending upon life course circumstances, involvement with organisations may result from obligation and have costs to well-being rather than benefits.

The mechanism of psychological benefits that formed the theoretical foundation for this study also comes with limitations. The lack of relevant measures means that the mechanism remains theoretical rather than proven. Attention to a more complete set of factors providing psychological resources may be required to lend weight to the theory in future research.

8.5.2 Social isolation and statistical power

One of the challenges in this research has been in the difficulty of studying the effects of social isolation in a large national data set. The isolated and the unhappy are more likely to leave the panel, and those with volatile levels of satisfaction are also under-represented. It is likely, therefore, that the level and effects of isolation may be under-stated. The measurement schema may not, seen in this light, have been the most productive way to examine isolation. While the emotionally isolated were separated from the socially isolated on strong theoretical and empirical grounds, the small subsamples resulted in a lack of clarity in the results on occasion. It was unclear, for example, in Chapter Six, if the move to emotional isolation was associated with a change or not. In Chapter Five, they appeared to do better than the civic-minded when feeling worse off, a finding contradicting the hypotheses but with coefficients of borderline significance bringing uncertain interpretation. Combining social and emotional isolation into a single category may have brought about more statistical power, though at the cost of greater heterogeneity within the category. Other network features for which measures

were not available may also be important such as network density or network range as indicated by Lin's (2001) position generator. The possibilities for the measurement schema are numerous and many of them potentially enlightening; however, robust enquiry will require extensive or more targeted samples.

There are further limitations in terms of statistical power. The models of life satisfaction were able to explain just a small amount of the variance, and fit statistics suggested that the protective factor models were not parsimonious. While this is fairly standard in happiness research, it also serves as a good reminder that there is still work to be done to fully understand the processes that bring about life satisfaction.

8.5.3 Unexplored avenues

Due to space limitations, there are many interesting lines of enquiry generated by the analyses in this research that have not been explored in full. It has shown, for example, that connectedness is remarkably dynamic. This has implications for the social capital thesis; are the theorised benefits of social capital such as social trust and effective democracy dependent upon the longevity of social ties? Other analytical methods such as state-trait analysis may be able to unravel whether occasional civic participation is equivalent in its consequences to continual participation.

Further, on the dynamics question, it is interesting that some life events such as becoming retired are linked to increased probabilities of both becoming isolated and becoming socially integrated. It may be that interactions of life events, personality and circumstances combine to shape personal networks.

The three-level models in Chapter Seven showed that connectedness reduces residual variance at the household level to a greater degree that the individual. An interesting extension to this study would be an examination of how social networks cluster within households and combine to influence subjective and material well-being where spill over effects may be at work. The original scope of this research included an examination of area effects, and the effects of social connectedness on the individual examined here may have interesting consequences for the area effects.

8.6 Summing up

Although this study is sociological in its attention to social networks and social status, it is the psychological elements that formed the explanatory framework. Self-esteem, self-worth, and perceived control are mechanisms supported by the literature on life satisfaction, social

networks, the effects of income, and social comparison and as such the theoretical foundations of this thesis were based on using these factors as a 'common denominator'. The resilience demonstrated in this thesis is *psychosocial*: individual psychologies are formed from social interaction. The role of psychosocial factors has been brought to the fore by Marmot's *Status Syndrome* (2007), and the findings of this thesis support the notion that status, as subjectively felt, and its associated benefits of strong self-concepts and perceptions of control have explanatory value.

This study has "[thrown] light on the conditions conducive to happiness" (Layard 2012a) by showing the money-happiness relationship is dependent upon other factors. It has shown that social context matters. The over-arching conclusion of this research is that the extent to which money can contribute to the happiness of an individual is contingent upon the social connectedness of the individual. The shape of the relationship varies according to the personal network type in which an individual is sited, whether the social network is restricted and inward-looking or extensive and outward-looking, and according to the measure of 'money'. This conclusion has implications for our understanding of the money-happiness relationship as the findings support the idea that the nature of the relationship is indirect. The mechanism, once basic needs have been fulfilled, is that money buys happiness as a result of psychological benefits rather than from direct and casual effects of consumption. Strong ties to family and friends offer support and are an essential buffer against the negative influence of low income and other financial stressors. Weak ties serve an important role too by providing additional and separable benefits than strong ties alone; they provide a wide pool of others who can facilitate threat appraisal; they provide less emotive and perhaps stronger role models and sources of comparison, as well as the sense of control and efficacy gained from taking on a variety of social roles.

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Appendix

Additional tables to Chapter 5

Maximum class probability > .9						
	Income		Fisit		Worse off	
fixed effect	**b**	**SE**	**b**	**SE**	**b**	**SE**
Year	**-0.010**	**0.003**	**-0.006**	**0.003**	-0.004	0.003
Instrumental	-0.087	0.076	-0.130	0.144	-0.033	0.079
Emotionally isolated	**-0.407**	**0.110**	**-0.431**	**0.205**	**-0.466**	**0.113**
Socially isolated	**-0.525**	**0.086**	**-0.874**	**0.154**	**-0.478**	**0.089**
Traditional	**-0.255**	**0.039**	**-0.326**	**0.077**	**-0.258**	**0.040**
Integrated	**-0.089**	**0.043**	**-0.183**	**0.086**	*-0.078*	*0.044*
Household income	-0.013	0.029	0.002	0.011	**0.031**	**0.012**
Financial situation			**0.201**	**0.019**		
Better off than last year					**0.067**	**0.032**
Worse off than last year					**-0.186**	**0.031**
Instrumental*income	**0.144**	**0.074**				
Emotional_isol*income	0.115	0.103				
Socially_isol*income	0.080	0.075				
Traditional*income	**0.100**	**0.033**				
Integrated*income	0.033	0.037				
instrumental*fisit			0.036	0.042		
emot_isol*fisit			0.042	0.063		
socially_isol*fisit			**0.148**	**0.044**		
traditional*fisit			**0.050**	**0.021**		
integrated*fisit			*0.044*	*0.024*		
Instrumental*betteroff					-0.084	0.084
Emotional_isol*betteroff					0.101	0.148
Socially_isol*betteroff					0.050	0.097
Traditional*betteroff					0.066	0.038
Integrated*betteroff					-0.028	0.042
Instrumental*worseoff					**-0.200**	**0.082**
Emotional_isol*worseoff					*0.259*	*0.133*
Socially_isol*worseoff					**-0.237**	**0.086**
Traditional*worseoff					-0.022	0.037
Integrated*worseoff					-0.004	0.041
Constant	**5.449**	**0.033**	**4.791**	**0.068**	**5.467**	**0.034**
Intra-class correlation	0.569		0.538		0.565	
AIC	89901.72		88724.21		89251.2	
N: obs / individuals	32444 / 4790		32412 / 4790		32337 / 4789	

Table A1.1 Protective factor models with observations removed where latent class assignment was on a probability below 0.9; based on models 4A, 5A, 6A in Chapter 5

2002-2007 only						
	Income		Fisit		worse off	
fixed effect	**b**	**SE**	**b**	**SE**	**b**	**SE**
Year	**-0.015**	**0.003**	**-0.014**	**0.003**	**-0.014**	**0.003**
Instrumental	-0.073	0.077	-0.092	0.155	-0.025	0.081
Emotionally isolated	**-0.416**	**0.111**	**-0.468**	**0.217**	**-0.484**	**0.114**
Socially isolated	**-0.495**	**0.087**	**-0.938**	**0.166**	**-0.485**	**0.091**
Traditional	**-0.262**	**0.039**	**-0.394**	**0.083**	**-0.266**	**0.040**
Integrated	*-0.084*	*0.044*	**-0.204**	**0.094**	*-0.074*	*0.045*
Household income	-0.007	0.031	0.001	0.012	**0.031**	**0.012**
Financial situation			**0.195**	**0.021**		
Better off than last year					**0.060**	**0.035**
Worse off than last year					**-0.180**	**0.035**
Instrumental*income	*0.146*	*0.079*				
Emotional_isol*income	0.090	0.105				
Socially_isol*income	**0.162**	**0.081**				
Traditional*income	**0.093**	**0.035**				
Integrated*income	0.015	0.040				
instrumental*fisit			0.026	0.046		
emot_isol*fisit			0.050	0.068		
socially_isol*fisit			**0.173**	**0.049**		
traditional*fisit			**0.069**	**0.023**		
integrated*fisit			*0.049*	*0.026*		
Instrumental*betteroff					-0.063	0.091
Emotional_isol*betteroff					0.131	0.155
Socially_isol*betteroff					0.136	0.104
Traditional*betteroff					*0.071*	*0.040*
Integrated*betteroff					-0.025	0.045
Instrumental*worseoff					**-0.224**	**0.093**
Emotional_isol*worseoff					**0.351**	**0.153**
Socially_isol*worseoff					**-0.214**	**0.097**
Traditional*worseoff					-0.050	0.041
Integrated*worseoff					-0.035	0.047
Constant	**5.442**	**0.034**	**4.803**	**0.074**	**5.458**	**0.035**
Intra-class correlation	0.573		0.541		0.568	
AIC	79664.1		78637.49		89251.2	
N: obs / individuals	28367 / 4933		28338 / 4933		28279 / 4932	

Table A1.2 Protective factor models with observations from 2008 removed; based on models 4A, 5A, 6A in Chapter 5

Multilevel ordered logit: income		
fixed effect	**log odds**	**SE**
Year	**-0.025**	**0.006**
Instrumental	-0.087	0.202
Emotional isolated	**-0.681**	**0.295**
Socially isolated	**-1.102**	**0.228**
Traditional	**-0.618**	**0.101**
Integrated	**-0.222**	**0.113**
Household income	-0.139	0.089
Instrumental*income	*0.423*	*0.241*
Emotional isol*income	*0.697*	*0.379*
Socially isol*income	0.145	0.261
Traditional*income	**0.393**	**0.103**
Integrated*income	0.185	0.115
Cut 1	**-7.282**	**0.113**
Cut 2	**-6.056**	**0.100**
Cut 3	**-4.457**	**0.093**
Cut 4	**-2.673**	**0.090**
Cut 5	**-0.297**	**0.088**
Cut 6	**2.832**	**0.090**
Random intercept: person	5.435	0.144

Table A1.3 Multilevel ordered logit 'protective factor' models – household income

Multilevel ordered logit: fisit		
fixed effect	**log odds**	**SE**
Year	**-0.016**	**0.005**
Instrumental	-0.337	0.360
Emotional isolated	*-0.998*	*0.520*
Socially isolated	**-1.917**	**0.382**
Traditional	**-0.823**	**0.184**
Integrated	**-0.430**	**0.209**
Household income	-0.013	0.021
Financial situation	**0.471**	**0.045**
Instrumental*fisit	0.138	0.104
Emot_isol*fisit	0.180	0.162
Socially_isol*fisit	**0.351**	**0.110**
Traditional*fisit	**0.130**	**0.051**
Integrated*fisit	*0.105*	*0.057*
Cut 1	**-5.773**	**0.177**
Cut 2	**-4.543**	**0.170**
Cut 3	**-2.929**	**0.167**
Cut 4	**-1.124**	**0.165**
Cut 5	**1.259**	**0.165**
Cut 6	**4.363**	**0.167**
Random intercept: person	4.833	0.129

Table A1.4 Multilevel ordered logit 'protective factor' models – subjective financial situation

Multilevel ordered logit: Better/ Worse off		
fixed effect	**log odds**	**SE**
Year	**-0.014**	**0.005**
Instrumental	0.046	0.205
Emotional isolated	**-0.896**	**0.288**
Socially isolated	**-1.005**	**0.228**
Traditional	**-0.647**	**0.103**
Integrated	-0.181	0.116
Household income	0.034	0.021
Better off than last year	**0.163**	**0.077**
Worse off than last year	**-0.455**	**0.073**
Instrumental*betteroff	-0.218	0.209
Emotional_isol*betteroff	0.353	0.361
Socially_isol*betteroff	0.022	0.237
Traditional*betteroff	0.129	0.089
Integrated*betteroff	-0.106	0.099
Instrumental*worseoff	**-0.457**	**0.196**
Emotional_isol*worseoff	**0.827**	**0.343**
Socially_isol*worseoff	**-0.405**	**0.209**
Traditional*worseoff	-0.007	0.086
Integrated*worseoff	0.032	0.096
Cut 1	**-7.302**	**0.112**
Cut 2	**-6.084**	**0.101**
Cut 3	**-4.491**	**0.095**
Cut 4	**-2.707**	**0.091**
Cut 5	**-0.341**	**0.090**
Cut 6	**2.757**	**0.092**
Random intercept: person	5.309	0.139

Table A1.5 Multilevel ordered logit 'protective factor' models – better or worse off than last year

	Instrumental	Emotionally isolated	Socially isolated	Traditional	Integrated	Civic minded
Log income	**0.182**	**0.358**	**0.150**	**0.203**	**0.071**	0.052

Table A1.6 Separate simple linear regression models by type of connectedness, single wave 2008; summary of coefficients and significance.

Additional tables to Chapter 6

	2A: controlling for lowest income quartile	2004		2008	
		b	**SE**	**b**	**SE**
	Household income	0.00	0.03	**0.12**	**0.03**
Starting class (ref cat is civic-minded)	Instrumentalist	**-0.15**	**0.06**	**-0.17**	**0.07**
	Emotionally isolated	**-0.59**	**0.08**	**-0.42**	**0.08**
	Socially isolated	**-0.51**	**0.07**	**-0.44**	**0.07**
	Traditional	**-0.24**	**0.04**	**-0.22**	**0.04**
	Integrated	*-0.07*	*0.04*	**-0.09**	**0.04**
Transition into… (destination class)	Civic-minded	0.05	0.05	*0.09*	*0.05*
	Emotional isolation	-0.12	0.10	**-0.38**	**0.16**
	Other less	**-0.07**	**0.03**	**-0.11**	**0.03**
	Other more	**0.07**	**0.04**	0.04	0.04
	Different	0.06	0.07	**-0.21**	**0.07**
Interactions: transitions * household income	Trans to civic * inc[1]	0.05	0.07	**-0.13**	**0.07**
	Trans to emot-isol *inc[2]	0.13	0.12	-0.04	0.27
	Other more * inc[3]	*0.11*	*0.05*	0.02	0.04
	Other less * inc	0.05	0.04	-0.01	0.04
	Different trans * inc[4]	*0.15*	*0.08*	**0.25**	**0.10**
	Lowest income quartile	**-0.09**	**0.04**	-0.02	0.04
	Constant	**5.46**	**0.03**	**5.42**	**0.04**
	Model fit/test statistics				
	R-squared	0.02		0.02	
	Wald test[1] (1 df)	3.62	P = 0.06		
	Wald test[2] (1 df)	0.35	p = 0.56		
	Wald test[3] (1 df)	1.92	p = 0.17		
	Wald test[4] (1 df)	0.70	P = 0.40		

Table A2.1: Model 2A with an additional control for low income

2A: controlling for starting class interactions		2004		2008	
		b	**SE**	**b**	**SE**
	Household income	**-0.09**	**0.04**	-0.01	0.05
Starting class (ref cat is civic-minded)	Instrumentalist	**-0.16**	**0.07**	-0.18	0.07
	Emotionally isolated	**-0.62**	**0.09**	**-0.44**	**0.08**
	Socially isolated	**-0.51**	**0.07**	**-0.47**	**0.07**
	Traditional	**-0.24**	**0.04**	**-0.23**	**0.04**
	Integrated	**-0.08**	**0.04**	*-0.10*	*0.04*
Interactions starting class * household income	Instrumentalist * inc	0.12	0.10	0.11	0.09
	Emotionally isol * inc	0.09	0.13	0.11	0.11
	Socially isolated * inc	**0.19**	**0.10**	0.02	0.09
	Traditional * inc	**0.18**	**0.05**	**0.19**	**0.06**
	Integrated * inc	0.07	0.05	0.09	0.06
Transition into… (destination class)	Civic-minded	0.04	0.05	*0.09*	*0.05*
	Emotional isolation	-0.14	0.10	**-0.38**	**0.16**
	Other less	**-0.06**	**0.03**	**-0.11**	**0.03**
	Other more	0.06	0.04	0.03	0.04
	Different	0.06	0.07	**-0.21**	**0.07**
Interactions: transitions * household income	Trans to civic * inc[1]	0.04	0.07	**-0.13**	**0.06**
	Trans to emot-isol *inc[2]	0.10	0.13	-0.05	0.27
	Other more * inc[3]	0.06	0.05	0.00	0.05
	Other less * inc	**0.12**	**0.05**	0.05	0.05
	Different trans * inc[4]	0.11	0.09	**0.24**	**0.10**
	Constant	**5.45**	**0.03**	**5.42**	**0.03**
	Model fit/test statistics				
	R-squared	0.02		0.02	
	Wald test[1] (1 df)	3.23	P = 0.07		
	Wald test[2] (1 df)	0.25	p = 0.62		
	Wald test[3] (1 df)	0.51	p = 0.47		
	Wald test[4] (1 df)	0.95	P = 0.33		

Table A2.2: Model 2A with additional interaction terms for starting class and income

	2A: additional controls for employment/ relationship change							
		2004		2008		2004		2008	
		b	**SE**	**b**	**SE**	**b**	**SE**	**b**	**SE**
	Household income	0.02	0.02	0.10	0.02	0.03	0.02	**0.12**	**0.02**
Starting class (ref cat is civic-minded)	Instrumentalist	**-0.14**	**0.06**	-0.15	0.07	**-0.16**	**0.06**	**-0.17**	**0.07**
	Emotionally isolated	**-0.56**	**0.08**	**-0.36**	**0.08**	**-0.60**	**0.08**	**-0.42**	**0.08**
	Socially isolated	**-0.49**	**0.07**	**-0.39**	**0.07**	**-0.52**	**0.07**	**-0.44**	**0.07**
	Traditional	**-0.22**	**0.04**	**-0.20**	**0.04**	**-0.24**	**0.04**	**-0.23**	**0.04**
	Integrated	*-0.06*	*0.04*	*-0.08*	*0.04*	**-0.07**	**0.04**	**-0.09**	**0.04**
Transition into… (destination class)	Civic-minded	0.04	0.05	0.08	0.05	0.04	0.05	0.09	0.05
	Emotional isolation	-0.10	0.10	*-0.30*	*0.16*	-0.14	0.10	*-0.38*	*0.16*
	Other less	**-0.06**	**0.03**	**-0.11**	**0.03**	**-0.07**	**0.03**	**-0.11**	**0.03**
	Other more	0.06	0.04	0.03	0.04	*0.07*	*0.04*	0.04	0.04
	Different	0.06	0.07	**-0.22**	**0.07**	0.06	0.07	**-0.21**	**0.07**
Interactions: transitions * household income	Trans to civic * inc[1]	0.04	0.07	*-0.11*	*0.07*	0.05	0.07	*-0.13*	*0.07*
	Trans to emot-isol *inc[2]	0.16	0.12	0.01	0.26	0.11	0.12	-0.04	0.27
	Other more * inc[3]	**0.10**	**0.05**	0.02	0.04	**0.11**	**0.05**	0.02	0.04
	Other less * inc	0.05	0.04	0.00	0.04	0.06	0.04	-0.01	0.04
	Different trans * inc[4]	*0.14*	*0.08*	**0.21**	**0.10**	*0.14*	*0.08*	**0.25**	**0.10**
	Newly studying	**-0.38**	**0.15**	-0.02	0.15				
	Newly Unemployed	**-0.48**	**0.09**	**-0.69**	**0.09**				
	Newly retired	0.06	0.05	**0.26**	**0.05**				
	Newly ill	**-0.76**	**0.09**	**-1.16**	**0.09**				
	Newly employed	**-0.14**	**0.05**	**-0.12**	**0.05**				
	Split up					**-0.48**	**0.08**	**-0.36**	**0.08**
	New relationship					0.05	0.05	**0.15**	**0.05**
	Newly widowed					0.07	0.09	-0.01	0.09
	Constant	**5.45**	**0.03**	**5.42**	**0.03**	**5.45**	**0.03**	**5.42**	**0.03**
	Model fit/test statistics								
	R-squared	0.03		0.04		0.02		0.02	
	Wald test[1] (1 df)	2.59	P = 0.10			3.41	P = 0.06		
	Wald test[2] (1 df)	0.25	p = 0.62			0.25	p = 0.62		
	Wald test[3] (1 df)	1.55	p = 0.21			2.01	p = 0.15		
	Wald test[4] (1 df)	0.25	P = 0.61			0.70	P = 0.40		

Table A2.3: Model 2A with additional controls for changes in economic activity and changes in marital status

Additional tables to Chapter 7

Controls 1) Area-level	Life Satisfaction			Financial Situation		
Fixed part of model	**b**	**SE**		**b**	**SE**	
Area income	-0.20	0.17		*0.26*	*0.13*	
Relatively badly off	0.18	0.10		-0.06	0.07	
Relatively well off	0.19	0.09		**0.34**	**0.07**	
Deprived homes in n'hood	**-0.03**	**0.01**		**-0.03**	**0.01**	
Household income	*0.08*	*0.03*		**0.24**	**0.02**	
Instrumental	-0.05	0.08		0.02	0.06	
Emotionally isolated	**-0.39**	**0.15**		-0.12	0.10	
Socially isolated	**-0.32**	**0.07**		-0.06	0.05	
Traditional	*-0.12*	*0.05*		**-0.10**	**0.04**	
Integrated	0.01	0.05		0.00	0.04	
Instrumental * badly off	-0.27	0.16		0.03	0.11	
Emotionally isol * badly off	**-1.17**	**0.30**		0.04	0.19	
Social isolated * badly off	0.13	0.16		-0.09	0.11	
Traditional * badly off	-0.18	0.11		0.07	0.08	
Integrated * badly off	-0.21	0.12		-0.06	0.08	
Instrumental * well off	-0.27	0.16		*-0.19*	*0.11*	
Emotionally isol * well off	**-0.17**	**0.35**		-0.13	0.23	
Social isolated * well off	0.22	0.15		**-0.23**	**0.11**	
Traditional * well off	-0.12	0.10		**-0.16**	**0.07**	
Integrated * well off	-0.10	0.10		**-0.20**	**0.07**	
North East	-0.11	0.08		0.04	0.07	
North West	-0.03	0.06		0.05	0.04	
Yorkshire and Humber	0.05	0.06		*0.09*	*0.05*	
East Midlands	-0.01	0.06		0.05	0.05	
West Midlands	-0.06	0.06		-0.01	0.05	
East of England	0.05	0.06		-0.02	0.05	
London	0.11	0.09		0.10	0.07	
South East	-0.08	0.06		-0.07	0.05	
South West	0.02	0.06		**-0.13**	**0.05**	
Constant	**5.45**	**0.06**		**3.10**	**0.05**	
Random Intercepts	**var**	**SE**	**ICC**	**var**	**SE**	**ICC**
Level 3: MSOA	0.02	0.01	2.1%	0.02	0.01	1.1%
Level 2: Household	0.34	0.02	41.5%	0.28	0.03	19.3%
Level 1: Individuals	0.46	0.01	56.5%	1.17	0.03	79.6%
Log likelihood	-12703.01			-10147.28		
AIC	25472.0			20360.6		

Table A3.1: Social comparison models with region controls

Controls 2) Household-level	Life Satisfaction			Financial Situation		
Fixed part of model	**b**	**SE**		**b**	**SE**	
Area income	-0.10	0.13		**0.31**	**0.10**	
Relatively badly off	0.14	0.10		-0.09	0.07	
Relatively well off	0.15	0.09		**0.27**	**0.06**	
Deprived homes in n'hood	**-0.02**	**0.01**		**-0.01**	**0.01**	
Household income	0.05	0.03		**0.20**	**0.02**	
Instrumental	-0.06	0.08		0.02	0.05	
Emotionally isolated	**-0.32**	**0.15**		-0.09	0.09	
Socially isolated	**-0.28**	**0.08**		-0.05	0.05	
Traditional	*-0.09*	*0.05*		*-0.07*	*0.04*	
Integrated	0.01	0.05		0.01	0.04	
Instrumental * badly off	-0.21	0.16		0.05	0.11	
Emotionally isol * badly off	**-1.08**	**0.31**		0.01	0.19	
Social isolated * badly off	0.15	0.16		-0.04	0.11	
Traditional * badly off	-0.15	0.11		0.11	0.08	
Integrated * badly off	-0.16	0.12		-0.02	0.08	
Instrumental * well off	*-0.26*	*0.16*		-0.14	0.11	
Emotionally isol * well off	-0.15	0.35		-0.04	0.22	
Social isolated * well off	0.16	0.15		*-0.18*	*0.11*	
Traditional * well off	-0.14	0.10		**-0.16**	**0.07**	
Integrated * well off	-0.11	0.10		**-0.17**	**0.07**	
Recent house move	0.03	0.05		-0.05	0.04	
Trouble paying housing	**-0.61**	**0.07**		**-1.04**	**0.05**	
Home owner	**0.23**	**0.04**		**0.24**	**0.03**	
Constant	**5.23**	**0.07**		**2.90**	**0.05**	
Random Intercepts	**var**	**SE**	**ICC**	**var**	**SE**	**ICC**
Level 3: MSOA	0.01	0.01	**1.0%**	0.02	0.01	**2.3%**
Level 2: Household	0.26	0.03	**18.3%**	0.28	0.02	**37.4%**
Level 1: Individuals	1.16	0.03	**80.7%**	0.45	0.01	**60.3%**
Log likelihood	-12357.52			-9661.577		
AIC	24769.0			19377.2		

Table A3.2: Social comparison models with household-level controls

Controls 3) Individual-level	Life Satisfaction								
				+ big 5			+ lifesat		
Fixed part of model	**b**	**SE**		**b**	**SE**		**b**	**SE**	
Area income	-0.10	0.13		-0.11	0.13		0.01	0.10	
Relatively badly off	0.13	0.10		0.13	0.09		0.09	0.08	
Relatively well off	**0.22**	**0.09**		**0.20**	**0.09**		**0.08**	**0.07**	
Deprived homes in n'hood	**-0.02**	**0.01**		**-0.02**	**0.01**		**-0.01**	**0.01**	
Household income	*0.05*	*0.03*		**0.08**	**0.03**		*0.03*	*0.02*	
Instrumental	-0.02	0.08		0.02	0.08		0.01	0.07	
Emotionally isolated	**-0.33**	**0.15**		-0.19	0.16		**-0.10**	**0.12**	
Socially isolated	**-0.22**	**0.07**		**-0.15**	**0.07**		**-0.10**	**0.06**	
Traditional	-0.05	0.05		-0.01	0.05		-0.04	0.04	
Integrated	0.03	0.05		0.05	0.05		0.00	0.04	
Instrumental * badly off	**-0.32**	**0.16**		**-0.34**	**0.16**		-0.04	0.13	
Emotionally isol * badly off	**-0.87**	**0.30**		-0.47	0.31		**-1.04**	**0.25**	
Social isolated * badly off	0.06	0.15		0.05	0.15		0.04	0.13	
Traditional * badly off	*-0.18*	*0.11*		*-0.17*	*0.11*		*-0.10*	*0.09*	
Integrated * badly off	-0.17	0.11		-0.15	0.11		-0.12	0.09	
Instrumental * well off	**-0.33**	**0.15**		**-0.30**	**0.15**		***-0.13***	***0.13***	
Emotionally isol * well off	-0.18	0.34		-0.25	0.36		***-0.54***	***0.29***	
Social isolated * well off	0.14	0.15		0.15	0.15		0.11	0.12	
Traditional * well off	-0.16	0.10		*-0.19*	*0.10*		-0.08	0.08	
Integrated * well off	-0.13	0.10		-0.16	0.10		-0.04	0.08	
Age	**-0.03**	**0.01**		**-0.03**	**0.01**				
Age squared	**0.00**	**0.00**		**0.00**	**0.00**				
Full time study	0.05	0.08		0.09	0.09				
Unemployed	**-0.50**	**0.09**		**-0.49**	**0.09**				
Retired	**0.19**	**0.06**		**0.25**	**0.05**				
Caring for home/ family	**-0.16**	**0.06**		**-0.10**	**0.06**				
Long term ill	**-1.22**	**0.07**		**-1.05**	**0.07**				
Divorced/ separated	**-0.26**	**0.05**		**-0.26**	**0.05**				
Widowed	**-0.25**	**0.07**		**-0.34**	**0.07**				
Never married	**-0.15**	**0.05**		**-0.15**	**0.05**				
Live alone	**-0.13**	**0.05**		**-0.09**	**0.05**				
Intermediate (class)	0.02	0.04		0.03	0.04				
Routine	-0.02	0.04		-0.01	0.04				
Not working	-0.03	0.08		-0.01	0.08				
Female	-0.04	0.03		0.05	0.03				
Agreeableness				**0.02**	**0.00**				
Conscientiousness				**0.04**	**0.00**				
Extraversion				**0.02**	**0.00**				
Neuroticism				**-0.07**	**0.00**				
Openness				**-0.01**	**0.00**				
Life satisfaction 2006							**0.61**	**0.01**	
Constant	**6.05**	**0.15**		**5.86**	**0.19**		**2.11**	**0.07**	
Random Intercepts	**var**	**SE**	**ICC**	**var**	**SE**	**ICC**	**var**	**SE**	**ICC**
Level 3: MSOA	0.01	0.01	1.1%	0.02	0.01	1.7%	0.00	0.01	0.2%
Level 2: Household	0.24	0.03	17.6%	0.19	0.03	16.0%	0.09	0.02	9.8%
Level 1: Individuals	1.11	0.03	81.3%	1.00	0.03	82.3%	0.82	0.02	90.1%
Log likelihood	-12270.27			-10693.31					
AIC	24618.5			21474.6					

Table A3.3: Social comparison models with individual-level controls – life satisfaction

Controls 3) Individual-level	Financial Situation			+ big 5			+ lifesat		
Fixed part of model	**b**	**SE**		**b**	**SE**		**b**	**SE**	
Area income	**0.32**	**0.10**		**0.30**	**0.11**		**0.27**	**0.10**	
Relatively badly off	*-0.13*	*0.07*		-0.12	0.07		-0.09	0.07	
Relatively well off	**0.40**	**0.06**		**0.38**	**0.07**		**0.29**	**0.06**	
Deprived homes in n'hood	**-0.02**	**0.01**		**-0.01**	**0.01**		**-0.02**	**0.01**	
Household income	**0.22**	**0.02**		**0.23**	**0.02**		**0.23**	**0.02**	
Instrumental	0.01	0.05		0.02	0.06		0.04	0.06	
Emotionally isolated	-0.14	0.09		-0.05	0.11		-0.05	0.10	
Socially isolated	-0.01	0.05		-0.03	0.05		-0.02	0.05	
Traditional	-0.02	0.04		0.00	0.04		-0.09	0.04	
Integrated	0.05	0.04		0.06	0.04		-0.01	0.04	
Instrumental * badly off	0.04	0.11		0.02	0.12		0.09	0.11	
Emotionally isol * badly off	0.08	0.18		-0.09	0.22		0.04	0.20	
Social isolated * badly off	-0.14	0.11		-0.09	0.11		-0.07	0.11	
Traditional * badly off	0.06	0.08		0.08	0.08		0.12	0.08	
Integrated * badly off	-0.03	0.08		-0.04	0.08		-0.04	0.08	
Instrumental * well off	*-0.18*	*0.11*		*-0.18*	*0.11*		-0.13	0.11	
Emotionally isol * well off	-0.11	0.22		-0.18	0.25		-0.26	0.23	
Social isolated * well off	**-0.27**	**0.10**		-0.13	0.11		-0.17	0.11	
Traditional * well off	**-0.21**	**0.07**		**-0.21**	**0.07**		*-0.12*	*0.07*	
Integrated * well off	**-0.22**	**0.07**		**-0.22**	**0.07**		**-0.17**	**0.07**	
Age	**-0.02**	**0.00**		**-0.02**	**0.00**				
Age squared	**0.00**	**0.00**		**0.00**	**0.00**				
Full time study	0.08	0.05		0.08	0.05				
Unemployed	**-0.51**	**0.06**		**-0.51**	**0.06**				
Retired	0.06	0.04		0.06	0.04				
Caring for home/ family	**-0.15**	**0.04**		**-0.15**	**0.04**				
Long term ill	**-0.37**	**0.05**		**-0.37**	**0.05**				
Divorced/ separated	**-0.30**	**0.04**		**-0.30**	**0.04**				
Widowed	-0.05	0.05		-0.05	0.05				
Never married	**-0.11**	**0.03**		**-0.11**	**0.03**				
Live alone	0.05	0.04		0.05	0.04				
Intermediate (class)	**-0.11**	**0.03**		**-0.11**	**0.03**				
Routine	**-0.16**	**0.03**		**-0.16**	**0.03**				
Not working	-0.05	0.05		-0.05	0.05				
Female	**0.04**	**0.02**		**0.04**	**0.02**				
Agreeableness				0.00	0.00				
Conscientiousness				**0.01**	**0.00**				
Extraversion				0.00	0.00				
Neuroticism				**-0.02**	**0.00**				
Openness				0.00	0.00				
Life satisfaction 2006							**0.17**	**0.01**	
Constant	**3.35**	**0.11**		**3.38**	**0.14**		**2.15**	**0.06**	
Random Intercepts	**var**	**SE**	**ICC**	**var**	**SE**	**ICC**	**var**	**SE**	**ICC**
Level 3: MSOA	0.02	0.01	**2.7%**	0.02	0.01	**3.1%**	0.02	0.01	**2.6%**
Level 2: Household	0.29	0.02	**38.2%**	0.28	0.02	**38.7%**	0.29	0.02	**38.7%**
Level 1: Individuals	0.44	0.01	**59.1%**	0.43	0.01	**58.2%**	0.44	0.01	**58.7%**
Log likelihood	-9766.756			-8722.311			-9457.085		
AIC	19611.5			17532.6			18964.17		

Table A3.4: Social comparison models with individual-level controls – financial situation

Life satisfaction Model 3A	< P5 household income excluded		< P25 household income excluded	
Fixed part of model	**b**	**se**	**b**	**se**
Area income (centred)	-0.16	0.15	-0.24	0.15
Relatively badly off	*0.20*	*0.10*	**0.26**	**0.12**
Relatively well off	*0.16*	*0.09*	**0.18**	**0.09**
Deprived homes in n'hood	**-0.03**	**0.01**	**-0.02**	**0.01**
Household Income (centred)	**0.11**	**0.04**	**0.17**	**0.05**
Instrumental	-0.02	0.08	0.05	0.09
Emotionally isolated	**-0.34**	**0.15**	-0.21	0.17
Socially isolated	**-0.33**	**0.08**	**-0.23**	**0.09**
Traditional	**-0.11**	**0.05**	-0.03	0.06
Integrated	-0.01	0.05	0.02	0.06
Instrumental * badly off	**-0.40**	**0.17**	-0.36	0.22
Emotionally isol * badly off	**-1.33**	**0.31**	**-1.46**	**0.42**
Social isolated * badly off	0.11	0.16	-0.09	0.21
Traditional * badly off	-0.21	0.12	**-0.33**	**0.15**
Integrated * badly off	**-0.25**	**0.12**	**-0.24**	**0.15**
Instrumental * well off	**-0.32**	**0.16**	**-0.38**	**0.15**
Emotionally isol * well off	-0.22	0.35	-0.35	0.35
Social isolated * well off	0.23	0.15	0.14	0.15
Traditional * well off	-0.13	0.10	**-0.20**	**0.10**
Integrated * well off	-0.08	0.10	-0.11	0.10
Constant	**5.42**	**0.06**	**5.34**	**0.06**

Table A3.5: Model 3A, with lowest household income observations removed. P5 cut-off = £815, P25 cut-off = £1455 equivalised income per month

Financial situation Model 3B	< P5 household income excluded		< P5 household income excluded	
Fixed part of model	**b**	**se**	**b**	**se**
Area income (centred)	-0.05	0.12	-0.06	0.12
Relatively badly off	0.07	0.08	**0.21**	**0.09**
Relatively well off	**0.22**	**0.07**	**0.23**	**0.07**
Deprived homes in n'hood	**-0.02**	**0.01**	**-0.02**	**0.01**
Household Income (centred)	**0.42**	**0.03**	**0.42**	**0.04**
Instrumental	0.04	0.06	0.07	0.06
Emotionally isolated	-0.06	0.10	-0.02	0.12
Socially isolated	-0.05	0.05	0.00	0.06
Traditional	**-0.08**	**0.04**	-0.06	0.04
Integrated	0.00	0.04	0.02	0.04
Instrumental * badly off	0.04	0.12	-0.03	0.16
Emotionally isol * badly off	0.02	0.19	0.11	0.27
Social isolated * badly off	-0.12	0.11	**-0.27**	**0.15**
Traditional * badly off	0.07	0.08	-0.08	0.11
Integrated * badly off	-0.09	0.08	**-0.21**	**0.11**
Instrumental * well off	*-0.19*	*0.11*	**-0.22**	**0.11**
Emotionally isol * well off	-0.16	0.22	-0.20	0.23
Social isolated * well off	**-0.23**	**0.11**	**-0.27**	**0.11**
Traditional * well off	**-0.17**	**0.07**	**-0.19**	**0.07**
Integrated * well off	**-0.18**	**0.07**	**-0.21**	**0.07**
Constant	**3.05**	**0.04**	**3.01**	**0.05**

Table A3.6: Model 5A with lowest household income observations removed. P5 cut-off = £815, P25 cut-off = £1455 equivalised income per month

Life satisfaction Model 3A	< P5 MSOA income excluded		< P5 MSOA income excluded	
Fixed part of model	**b**	**se**	**b**	**se**
Area income (centred)	-0.14	0.14	-0.13	0.14
Relatively badly off	*0.17*	*0.10*	*0.17*	*0.10*
Relatively well off	*0.19*	*0.09*	**0.22**	**0.10**
Deprived homes in n'hood	**-0.03**	**0.01**	**-0.03**	**0.01**
Household Income (centred)	**0.07**	**0.03**	**0.06**	**0.03**
Instrumental	-0.05	0.08	-0.01	0.09
Emotionally isolated	**-0.38**	**0.15**	-0.34	0.16
Socially isolated	**-0.29**	**0.08**	**-0.38**	**0.08**
Traditional	**-0.11**	**0.05**	-0.09	0.06
Integrated	0.01	0.05	0.01	0.06
Instrumental * badly off	**-0.28**	**0.16**	**-0.32**	**0.16**
Emotionally isol * badly off	**-1.16**	**0.30**	**-1.20**	**0.30**
Social isolated * badly off	0.10	0.16	0.19	0.16
Traditional * badly off	-0.19	0.11	**-0.21**	**0.11**
Integrated * badly off	**-0.22**	**0.12**	**-0.23**	**0.11**
Instrumental * well off	**-0.27**	**0.16**	-0.26	0.19
Emotionally isol * well off	-0.10	0.41	-0.22	0.51
Social isolated * well off	0.20	0.16	0.36	0.19
Traditional * well off	-0.12	0.10	**-0.15**	**0.12**
Integrated * well off	-0.09	0.10	-0.11	0.12
Constant	**5.44**	**0.06**	**5.43**	**0.06**

Table A3.7: Model 3A, with lowest area income observations removed. P5 cut-off = £350, P25 cut-off = £400 equivalised income per week

Financial situation Model 3B	< P5 MSOA income excluded		< P5 MSOA income excluded	
Fixed part of model	**b**	**se**	**b**	**se**
Area income (centred)	**0.29**	**0.11**	**0.26**	**0.12**
Relatively badly off	-0.07	0.07	-0.04	0.07
Relatively well off	**0.37**	**0.07**	**0.38**	**0.08**
Deprived homes in n'hood	**-0.03**	**0.01**	**-0.02**	**0.01**
Household Income (centred)	**0.24**	**0.02**	**0.25**	**0.03**
Instrumental	0.04	0.06	0.11	0.06
Emotionally isolated	-0.09	0.10	-0.04	0.10
Socially isolated	-0.05	0.05	-0.06	0.06
Traditional	**-0.09**	**0.04**	*-0.07*	*0.04*
Integrated	0.00	0.04	0.02	0.04
Instrumental * badly off	0.02	0.11	-0.04	0.11
Emotionally isol * badly off	0.03	0.19	-0.02	0.19
Social isolated * badly off	-0.09	0.11	-0.08	0.11
Traditional * badly off	0.07	0.08	0.05	0.08
Integrated * badly off	-0.06	0.08	-0.07	0.08
Instrumental * well off	**-0.24**	**0.11**	**-0.43**	**0.13**
Emotionally isol * well off	-0.23	0.25	**-0.64**	**0.31**
Social isolated * well off	**-0.27**	**0.11**	-0.14	0.14
Traditional * well off	**-0.19**	**0.07**	**-0.23**	**0.08**
Integrated * well off	**-0.21**	**0.07**	**-0.22**	**0.08**
Constant	**3.08**	**0.04**	**3.06**	**0.05**

Table A3.8: Model 5A, with lowest area income observations removed. P5 cut-off = £350, P25 cut-off = £400 equivalised income per week