Exploring the Relationships Between Mental Health and Sociostructural Inequalities.

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Abstract

According to the World Health Organisation, approximately 450 million people worldwide have a mental disorder. Moreover, mental disorders account for 23 percent of the global burden of disease, which is higher than that for cancers and cardiovascular disease. Influences on mental well-being are complex and often involve interactions between several different socio-economic and socio-demographic factors. A range of large-scale survey datasets are now available that feature information on mental health and allow the exploration of a wide-range of risk factors that might influence mental health, featuring designs, such as repeated contacts data, that could support new insights into influences on mental health. This study exploits a selection of contemporary survey data resources and explores the complexity of mental health and its relation to a range of economic and socio-demographic factors. Analytical chapters evaluate four key areas of influence on mental health: to explore the pattern and variation of mental health and well-being across socio-demographic and socio-economic indicators; to explore transitions in labour market status and their influence on mental health and well-being; to examine the relationship between mental health and fine-grained occupational differences; to explore cross-national differences in the way that happiness and subjective well-being is linked to socio-economic and socio-demographic differences during 2006, 2008 and 2010.

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Chapter 1 - Mental Health and Well-Being

1. Introduction

According to the World Health Organisation (WHO), approximately 450 million people worldwide have a mental disorder (WHO, 2001: 3). In the same report they state that mental disorders account for 12 percent of the global burden of disease, and in developed nations alone, this figure increases to 23 percent, which is higher than that for cancers and cardiovascular diseases (*ibid*: 3). Estimates regarding the prevalence of mental disorder vary between and indeed within countries. Several large-scale epidemiological studies have reported that in the United States, New Zealand, France, Colombia, Ukraine and the United Kingdom for example, one in four adults experience a mental disorder in any one year (Kessler et al. 2009; McManus et al. 2009). One-third of people in these same countries will experience a mental disorder during the course of their lifetime (Kessler et al. 2004; Wittchen and Jacobi, 2005). In Germany, Belgium and the Netherlands for example, the prevalence of mental disorder is slightly lower, where between 10 percent and 15 percent of the population have a mental disorder in any given year (Kessler et al. 2004), and one quarter will experience a mental disorder during their lifetime (Kessler et al. 2009). Countries such as Japan, China and Italy for example, typically report the lowest prevalence rates of mental disorder, where approximately nine percent of the population have a mental disorder in any one year (Kessler et al. 2004) and one in six people will experience a mental disorder in their lifetime (Kessler et al. 2009).

1.2 Prevalence of mental disorder

Not only are some mental disorders more or less prevalent than others, some people and groups alike are also more susceptible to experiencing mental disorder than others. With regards to the first point, the least prevalent mental disorders are often referred to as ‘severe (or serious) mental illnesses’ (SMI’s), or psychoses more broadly, and include schizophrenia, bipolar disorder, psychotic depression and delusional disorder for example (Ruggeri et al. 2000). Symptoms associated with severe mental illnesses are characterised by auditory and/or visual hallucinations, delusional beliefs and disorganised thinking for

example, and affect a person's cognition, perception and sense of reality (McManus et al. 2009: 13). Collectively, between one to four percent of the population in high-, low- and middle-income countries will experience a serious mental disorder (Kessler et al. 2004). In the United Kingdom, approximately 1 percent of the population has a serious mental disorder (Singleton et al. 2001).

The more prevalent, or 'common mental disorders' (CMDs), which were previously referred to as 'neurotic disorders', represent a broad classification of mental disorders characterised by different types of depression and anxiety (McManus et al. 2009: 27). Common mental disorders are understood to be 'functional' disorders, since symptoms do not affect cognition or perception of reality. This is not to suggest however that common mental disorders, or symptoms associated with common mental disorders are any less 'serious', life-limiting or debilitating than serious mental illnesses (Fryers et al. 2005). Disorders include anxiety disorder, depression, mixed anxiety and depression, generalised anxiety disorder (GAD), phobias, obsessive compulsive disorder (OCD), post-traumatic stress disorders (PTSD), and panic disorder for example. Common mental disorders have a combined global lifetime prevalence rate of approximately 20 percent, and a 12-month prevalence rate of almost 30 percent (Steel et al. 2014).

When comparing prevalence rates of common mental disorders across countries, a consistent finding is that Western developed nations record the highest prevalence rates, where anxiety disorders are the most frequently occurring, followed by mood disorders (Kessler et al. 2004). With specific reference to the United Kingdom, between 15 and 20 percent of adults experience a common mental disorder in any one year, and almost one-third of the population will develop a common mental disorder during their lifetime (Singleton et al. 2001).

1.2.1 Gender disparities in prevalence of mental disorders

As previously stated, mental disorders are not evenly distributed across society and some people and groups are more susceptible to, and likely to develop certain mental disorders than others. Demographic factors such as gender, age and ethnicity are important

determinants of health (including mental health) since they influence an individual's exposure to risks and protective factors, opportunities and experiences in many domains across the life course (Goldie et al. 2011). For example, it is well-established that in developed Western nations depression is twice as prevalent among females than it is in males (Van de Velde et al. 2010). Moreover, for most anxiety disorders, including panic-disorder, post-traumatic stress disorder (PTSD), social phobia and generalised anxiety disorder (GAD), women have higher rates of prevalence than men (Afifi, 2007: 387). However, men have higher rates of alcohol dependency and substance abuse disorders, and are more likely to be diagnosed with personality disorder than females (*ibid*: 387). Gender differences in lifetime and 12-month prevalence rates for schizophrenia and other serious mental illnesses are less pronounced (Astbury, 2001). However, even where prevalence rates for men and women for various mental disorders are similar, gender disparities may still exist in the age of onset, pattern, severity and duration of symptoms, response to treatment and recovery rates for example (Afifi, 2007).

A paradoxical finding is that while females are twice as likely as men to experience depression, men are *at least* twice as likely to commit suicide than females across many countries (Moller-Leimkuhler, 2003). In the United States for example, the ratio of female-to-male suicide is 1:6; in the UK as a whole, male suicide rates are three-and-a-half times the female rate; and in Scotland, males suicide rates are approximately 3 times higher than their female counterparts (Murphy, 1998; Scowcroft, 2014). However, it is important to be aware that while men are more likely to commit suicide than women, women are more likely to engage in non-fatal suicide, which has been referred to as the *gender paradox of suicidal behaviour* (Schrijvers et al. 2012: 19). There are several potential reasons why the aforementioned gender disparities in suicide and suicidal behaviour exist. Schrijvers et al. (2012) found that gender-related differences in psychosocial risk factors and life-events; in methods of suicide; in rates of psychiatric (co)morbidity; in reporting suicidal thoughts/ behaviour; in help-seeking behaviour; and differences in the duration of the suicidal process, contributed to the gender gap in suicide and suicidal behaviour (Schrijvers et al: 19).

1.2.2 Age-based disparities in prevalence of mental disorders

Age represents another important determinant of mental health and mental well-being. The onset of many mental disorders typically occurs during childhood or adolescence, and approximately half of all lifetime disorders start by the mid-teens and three-quarters by the mid-20's (Kessler et al. 2007: 359). Epidemiological studies have identified various risk factors that people may be exposed to at different stages of their life (from the prenatal period, early childhood and childhood, adolescence, adulthood and older adulthood), that contribute to the likelihood of experiencing poor mental (and indeed poor physical) health outcomes; mother drinking when pregnant; insecure attachment in early childhood; family violence; difficulties at school; neighbourhood crime; poor housing; unemployment; substance abuse; physical ill-health and elder abuse for example (WHO, 2012: 6).

From a sociological perspective, we recognise that individuals are exposed to different risks (for health) at different stages of their development, (WHO, 2012). Risk and indeed protective factors are present in all spheres of life, beginning in the womb, at home and wider family, the neighbourhood, school, work and the country one resides in for example. However, as will be discussed in greater detail throughout this thesis, many of the risk (and protective) factors which individuals are exposed to are socially structured, and individuals accumulate disadvantage and advantage throughout their life, making people more or less vulnerable to various health outcomes (Marmot and Wilkinson, 2006). Moreover, being advantaged/disadvantaged in one area of life, is often accompanied by related advantages/ disadvantages in other areas of life, and these are likely to cluster cross-sectionally and accumulate longitudinally (Blane, 2006; Holland et al. 2000).

1.2.3 Ethnic disparities in prevalence of mental disorders

The relationship between ethnicity and mental health is not addressed within this thesis, but nonetheless, many of the reasons why disparities in mental health exist between and within black and minority ethnic groups might also apply to differences between other groups, such as between men and women, or age-groups, or social classes for example (Fitzpatrick et al. 2014). That is to say that there may be common casual pathways and

mechanisms through which health inequalities between various groups are generated and reproduced. For example, many black and minority ethnic groups are disproportionately affected by poverty and deprivation, where a focus on the social determinants of health might help explain the mental health consequences associated with poverty, social exclusion, unemployment and other markers of low social position (Keating et al. 2003).

Some broad findings with regards to ethnic disparities in mental health in the United Kingdom suggest that people from black and minority ethnic (BME) groups are more likely to be diagnosed with a mental disorder; are more likely to be diagnosed and admitted to hospital; are more likely to experience a poor outcome from treatment; and more likely to disengage from mental health services (Mental Health Foundation, 2014). Other commonly cited statistics suggest that rates of psychosis are higher in the African Caribbean population living in the UK, where young men and those who were born in the United Kingdom are identified as being at most risk (Nazroo, 1998: 145). It is also reported that rates of depression and common mental disorders are lower in the African Caribbean population (living in the UK) when compared to the white-British population, and lower still for South Asians living in the UK (Nazroo, 1998).

However, Nazroo (1998) argues that the aforementioned findings, which are commonly cited within the literature that discusses ethnic disparities in mental health, are based on data collected from clinical settings and resultantly, only provides information about the 'treated population' and offers no information about mental health and illness within the 'non-treated' black and minority ethnic groups living in the community (Naxroo, 1998: 145). Addressing the use of mainly clinical samples, Nazroo (1998) utilised a community-based survey, the 'British Fourth National Survey of Ethnic Minorities, 1993-1994' (Berthoud et al. 1997), and found that rates of depression in the African Caribbean population were actually higher than in the white-British population (6 percent and 3.8 percent weekly prevalence respectively) (Nazroo, 1998: 146). In addition, while rates of psychosis were higher in the Caribbean population than in the white-British population, it was not as high in the former as might have been expected (75 percent higher in BME groups than in white-British population) (*ibid*: 146).

1.2.4 The social gradient in mental health

That patterns of mental health and mental 'ill-health', like patterns of health and illness more generally, follow a social gradient, is well-documented (Black et al. 1980; Marmot et al. 1991; Acheson, 1998; Wilkinson and Marmot, 2006; Fryers et al. 2005). That is to say that prevalence and risk of psychological distress, symptoms associated with mental disorders, and specific mental disorders, are inversely related to socio-economic position. (Davidson et al. 2006; Skapinakis et al. 2006). In attempts to explain why such patterns exist, a number of theories have been posited. In much of the inequalities in health literature and as a starting point, the findings of the Black Report (Black et al. 1980) are often cited alongside four explanations for understanding the relationship between social position and health; measurement artefact; social selection; cultural/behavioural; and materialist explanations. Since the publication of the Black Report, additional variables and different mechanisms and causal pathways linking the 'social' with various 'health' outcomes have been identified (Rogers and Pilgrim, 2014). However, the fourfold typology presented in the Black Report is still useful for introducing the topic of inequalities in health, which includes mental health, while outlining some of the key theories that have guided research over the past four or five decades. While this is not meant to be a critique of the Black Report, a brief assessment of each explanation in terms of its ability to explain why a social gradient in (mental) health and ill-health exists is offered. Discussion will then focus on theories and explanations that deal specifically with mental health and well-being.

1.2.5 Measurement artefact

The artefact explanation views the observed pattern (the social gradient in health) as being the result of the data collection process and suggests that measures used to conceptualise 'social position' and 'health' are artificial and not real (Blane, 1985). At its extreme, or the 'hard' interpretation (Macintyre, 1997), the artefact explanation implies that not only is the relationship between health and social class, or social position more broadly, non-existent, health inequalities are too non-existent and merely artefacts of the data and subsequent measures utilised therein (West, 1998). Such an extreme interpretation is widely rejected

however, and through the analysis of longitudinal data for example, there is much agreement that health and mental health inequalities are real and not merely an artefact of the data (Blane, 1985: 425). However, what the artefact explanation does do, is raise some serious questions about the conceptualisation, operationalisation and measurement of various health and social related phenomena. Thus a 'soft' interpretation of the artefact explanation holds that the size and magnitude of the social gradient in relation to health inequalities, is somewhat dependent upon the measures used to capture complex social and health related characteristics (Macintyre, 1997: 727). Like so many concepts within the social sciences, such as social class; socio-economic status; mental health; mental well-being; and psychological distress, there is no one variable or characteristic that can effectively capture, represent or measure these phenomena. However, reliable and valid measures of such phenomena are routinely included within various types of surveys that can be used to test hypotheses and explore the relationship between the social structure and (mental) health. Although it still stands, that if our measures are flawed, then it follows that our findings and conclusions will also be flawed.

1.2.6 Social selection

Social selection theory is the second explanation presented in the Black Report (Black et al. 1980), and can also be interpreted in different ways. However, in his review of the Report, West (1998) states that the authors fail to properly distinguish between the processes of 'natural' selection and 'social' selection and instead couple these together (pg. 10). In another review of the Black Report, Macintyre (1997) states that the authors' description of selection theory actually related more to 'natural' rather than 'social' selection (pg. 727), which according to both reviewers, "almost nobody would subscribe to" (West, 1998: 10). Briefly, natural selection theory, in the context of explaining health inequalities, holds that health status is *the* single factor which determines social position, where the healthiest or fittest members of society are selected into higher socio-economic positions and the unhealthiest, the most frail and psychologically distressed/disordered for instance, drift down the social ladder to occupy lower socio-economic positions (Pilgrim and Rogers, 2014: 22). In this model, health elicits a direct effect on one's social position and by implication, social position and social mobility simply reflect, or are seen as the

consequences related to the process of 'natural' selection. Such an extreme interpretation is thought by many to be unnecessarily reductionist (Macintyre, 1997). Moreover, the results from various studies which have explored the relative impact and significance that direct health selection has on social position overwhelmingly confirm that direct health selection is small (Blane, 1993).

Alternatively, the 'soft' version of selection theory engages with the 'social', and accepts that health and health related characteristics can influence a person's social position and direction of social mobility, but that this takes place through various processes of mainly 'social' selection (in education, occupation and marriage for example) (Macintyre, 1997). Unlike the 'hard' interpretation, where health is understood to elicit a direct effect on ones social position, the 'soft' version holds that there are some other variables and factors that affect both health *and* social position (Blane et al. 1993). For example, being ill during childhood may result in a person not being able to attend school for periods of time and subsequently fail to achieve the same or similar level of qualifications as their peers. That person may therefore be at a disadvantage when entering the labour market and find that through lack of options, they enter into low paid, low skilled occupations. In this example, a person's social position is influenced by their childhood health status, but not directly, instead, they are disadvantaged vis-a-vis their educational experience which leaves them disadvantaged in adult life when entering the labour market. However, and again through the analysis of longitudinal data, it is clear that while health status does have a role to play in influencing ones capacity for social mobility, the higher rates of morbidity and mortality reported amongst socially disadvantaged groups cannot be entirely attributed to health related social mobility (West, 1998: 11).

1.2.7 Cultural/behavioural

Thirdly, the cultural/behavioural explanation is outlined, where a strict, or 'hard' interpretation views inequalities in health as being due to differential health behaviours exercised by people in different social classes (Macintyre, 1997). This explanation holds that low socio-economic status groups are more likely to adopt unhealthy practices/ behaviours than more socio-economically advantaged status groups (Murali et al. 2004).

Behavioural factors including smoking, drinking, diet, exercise and health seeking practices are often regarded as being key to understanding why members of lower socio-economic status groups have higher rates of morbidity and mortality. In other words, the distribution and indeed variation in health across the social hierarchy is understood to be the result of behavioural choices, which are often characterised as being within the control of individuals. From this perspective, the unhealthiest members of society, who also tend to occupy, or cluster in lower socio-economic positions within the social hierarchy, are themselves to blame for being unhealthy. This in turn would explain why a social gradient in health exists and persists. At its extreme, this view can be seen to 'blame the victim' and ignore the wider, underlying reasons that lead to maladaptive behaviours and ignore the social context within which people 'freely' act and behave (Bartley et al. 1998).

Bartley (1998) argues that studies concerned with exploring inequalities in health should not focus on the individual level risk factors and risky behaviours to the neglect of the macro-social environment (*ibid:* 567). Instead, we should be asking why people who occupy certain positions within the social hierarchy, act and behave in the ways that they do (Bartley et al. 1998: 567). Such recognition is encompassed within a more balanced, and arguably more sociologically inspired interpretation of the cultural/behavioural explanation. While accepting that individual's make decisions and choices which in turn influence their health and well-being, we must also recognise that these choices are situated within various contexts; social, economic, familial, cultural, political and so forth (Lynch and Kaplan, 1997). Thus people in lower socio-economic status groups may find that their choices are somewhat constrained relative to those who occupy more advantageous social positions. These considerations shift the blame away from the individual and instead highlights the influence that wider social structures within which individuals are embedded have in influencing and constraining health damaging and indeed health promoting/protecting behaviours and practices (Williams, 2000). In other words, health damaging behaviours, and risk factors associated with poor mental and physical health are themselves subject to a social gradient (Macintyre, 1997). These considerations bring to the fore one of the classical sociological problems, that of the role of structure versus agency (Bartley et al. 1998).

1.2.8 Materialist/structuralist

The final explanation outlined in the Black Report (Black et al. 1980) is the materialist/ structuralist explanation, of which there are various models. Macintyre (1997) again offers a 'hard' and a 'soft' interpretation of the materialist/structuralist explanation, a distinction she claims the authors of the Black Report failed to make clear. A 'hard' interpretation holds that the material, physical conditions of life which are determined by socio-economic position can completely explain the social gradient in health (Macintyre, 1997: 728). From this perspective, people who occupy low socio-economic positions within the social hierarchy, by implication, are more likely to be exposed to a variety of risks which can in turn affect health and well-being. Low income, inadequate housing, dangerous and hazardous working environments, poor diet and limited access to healthcare, education, transport, recreation and other important resources have all been shown to affect a person's health. However, as Marmot (2001) clearly states, a focus on the physical and material conditions does not explain why university educated civil servants, with stable jobs and reasonable incomes have poorer health outcomes than those in higher grades or who are above them in the social hierarchy (Marmot, 2001a: 1168). While the material conditions may be more important when people are living in *absolute* poverty and deprivation, we must consider other factors and variables that influence health if we want to understand why the social gradient is present across the entire social hierarchy, and not limited to those at or near the bottom (Wilkinson et al. 2003).

1.3 Unemployment and mental well-being

There is much evidence to support the claim that being unemployed is detrimental for one's mental and physical health and well-being (Wilkinson and Marmot, 2003). Research consistently finds that compared to those who are employed, people who are unemployed are at greater risk of psychiatric morbidity, most notably anxiety and depression (Fryers et al. 2003); have poorer general health, more longstanding and limiting illnesses (Bartley, 2012); and higher mortality (Bartley et al. 2005). Having a job not only provides individual's with a source of income, but also encourages social contact, structures one's day, can give people a sense of purpose, identity and fulfilment, can enhance self-esteem

and is a route by which social status is achieved (Winkelmann et al. 1998). In noting the economic and non-economic benefits of employment, it might be argued that unemployment results in the opposite effects or risks including increased financial hardship; reduced social contact and feelings of isolation; lack of control; diminished sense of purpose and reduced social status. When considering the various pathways through which unemployment might affect mental health we must also explore the relative impact that sociodemographic and socioeconomic factors have on these relationships. Age, gender, relationship status, educational attainment, financial situation, (parental) social class and position within the social hierarchy for example, can buffer and/or exacerbate many of the effects of unemployment.

However, to posit that unemployment is 'bad' for health and well-being and employment is 'good' is too simplistic and represents a false dichotomy. That is to say that employment can itself be a major source of stress and unsatisfactory employment can be as detrimental for mental health as no employment (Bartley, 1994; Broom et al. 2006). Broadly speaking however, and corroborated by the findings reported in many studies, the financial and wider non-economic benefits of employment far outweigh the negative effects that are associated with unemployment. This is true from both a cross-sectional perspective where levels of mental health are compared across unemployed and employed groups (McKee-Ryan et al. 2005), and longitudinally, where the impact that unemployment, and transitions to and from unemployment has on mental health is considered over time (Thomas et al. 2005; 2007).

1.3.1 Workplace stress

There are various potential sources of workplace stress and the types of stressors that workers are exposed to depends upon several often interrelated factors. These include the type of occupation and job that is performed; the physical environment in which this takes place; hours normally worked; demands of the job and amount of control one has over their working day; the level of support available from management and colleagues; relationships at work; the position one holds; the sector of employment and how organisational change is managed for example (Health and Safety Executive, 2008).

However, just as the working population cannot be treated as one homogenous group, neither can those who are in various forms of non-employment, such as unemployment; maternity leave; retirement; students and those unable to work as a result of their health for example. In addition, and just as people working in the same occupation or under the same conditions do not experience the same levels of stress, groups within specific forms of non-employment do not by virtue of their shared status (for example being unemployed or retired) have the same levels of psychological well-being or distress alike (Flint et al. 2013).

Of the aforementioned forms of non-employment the effect that unemployment has on various outcomes, of which mental health is one, has arguably received the greatest attention. Whether this be from a cross-sectional perspective where levels of mental health are compared across unemployed and employed groups; or longitudinally, where the impact that unemployment has on mental well-being is estimated over time. Broadly speaking, people who are unemployed tend to have poorer mental (and physical) health when compared to groups who are employed (Weich and Lewis, 1998). Similarly, moving into a state of unemployment is generally detrimental for mental health and well-being while re-employment improves mental health (Murphy and Athanasou, 1999; Thomas et al. 2005).

Three meta-analytic reviews that lend weight to these claims include Murphy and Athanasou (1999); McKee-Ryan et al. (2005) and more recently Paul and Moser (2009). Murphy and Athanasou (1999) selected nine longitudinal studies that were conducted between 1986 and 1996 and meta-analysed the impact that job-loss and re-employment had on the mental well-being of individuals. The authors reported that moving from employment into unemployment resulted in a weighted effect size of d= .36 (increasing psychological distress), while moving out of unemployment into employment had a weighted effect size of d= .54 (decreasing psychological distress) (Murphy and Athanasou, 1999: 83). McKee-Ryan et al. (2005) identified 52 cross-sectional studies where psychological and physiological well-being of unemployed and employed samples were compared; reporting that unemployed individuals had lower mental well-being (d= -.57), poorer physical health (d= -.48), and reduced life-satisfaction (d= -.21) than their employed

counterparts (McKee-Ryan et al. 2005: 61). In the same study, the authors also meta-analysed 25 longitudinal studies, fifteen of which explored the impact of transitions into employment (from a state of unemployment), and ten considered the opposite transition, that is moving into unemployment from a previous state of employment. With regards to the first transition (regaining employment), mental health improved (d= -.89), as did subjective health status (d= -.36) and life-satisfaction (d= -3.04). When the latter transition was considered across the 10 studies (moving into unemployment), mental health deteriorated (d= -.38) when compared to those who remained employed (McKee-Ryan et al. 2005: 64).

A further example of a more recent meta-analytic review that comprised 237 cross-sectional studies and 87 longitudinal studies which considered the effect that unemployment had on mental health outcomes is that of Paul and Moser's (2009). According to their results, and with specific reference to their meta-analysis of cross-sectional data, compared to groups who were employed, those who were unemployed had poorer mental health as measured across six indicator variables (mixed symptoms d= .55; depression d= .50; anxiety d= .40; psychosomatic symptoms d= .11; subjective well-being d= .51; self-esteem d= .45), while overall prevalence of psychiatric morbidity amongst the unemployed was d= .54 (Paul and Moser, 2009: 271). Their meta-analysis of longitudinal studies focussed on the estimated change in mental well-being that seven different transitions (including remaining within-state) in labour market status elicited. Moving from a state of employment into unemployment was associated with an increase in distress symptoms (d= .19) while going from unemployment into employment reduced prevalence of such symptoms (d= -.35). For those who remained employed over the sample period, a slight reduction in distress symptoms was reported (d = -.06), and interestingly, a similar figure was also reported for those who remained unemployed for the sample period (d= -.08) (both were significant at $p<.001$) (Paul and Moser, 2009: 275).

What these meta-analytic reviews reveal is that cross-sectionally, unemployed groups have on average poorer mental and (where measured) poorer physical health and well-being than people who are employed. Longitudinally, moving into unemployment is associated with a deterioration in mental well-being and increases the risk of experiencing symptoms

associated with psychiatric morbidity. Conversely, moving into employment from a state of unemployment improves mental well-being. From this perspective, it might be argued that unemployment *causes* such health effects (causation). However, it is also possible that people who have poor (mental) health are more likely to lose their job and/or less likely to regain employment as a direct result of their health status (selection) (Taris, 2002). For example, someone who experiences depression and/or anxiety (the most common mental disorders), may not be able to perform as well as they could, or perhaps should, in certain situations at work. It might be necessary for such individuals to take more time off of their work than others who do not have psychological concerns. If unemployed, having a mental disorder might also influence an individual's job search behaviour and make less likely their chances of gaining employment. Real or perceived discrimination may also be an issue, where employers might be reluctant to employ individuals who have, or they suspect to have mental health problems, for all of the aforementioned reasons.

1.4 Research questions to be addressed

Chapter 4 - Sociodemographic and Socioeconomic Patterns in the Distribution of Mental Health:

1. Examine patterns and variation of mental health and well-being across a variety of socio-demographic and socio-economic indicators.
2. How much variation in mental health and well-being is explained by including and excluding subjective health status?

Chapter 5 - Labour Market Transitions and the Impact on Mental Health and Well-being:

1. What impact do transitions in labour-market status have on mental health and well-being?
2. Explore the relationship between intermediate transitions in labour-market status and mental well-being?
3. Does the relationship between labour-market status and mental well-being differ by gender?

4. To what extent does previous ‘caseness’ status affect the likelihood of a person being a ‘case’ in the following year while controlling for labour-market transitions and socio-demographic and socio-economic characteristics?

Chapter 6 - Occupation and Mental Health: Gender Disparities:

1. Identify occupations that are associated increased and decreased risk of psychiatric morbidity and explore these patterns by gender.
2. Explore the relationship between mental well-being and occupation across different types of occupational classification schemes.

Chapter 7 - Happiness and the Role of Personal Values Across Europe: Evidence from the European Social Survey:

1. To what extent have levels of happiness changed across Europe from the period prior to the financial crisis (2006), to during the year of the financial crisis (2008), and two years after (2010) although still in the midst of the financial crisis?
2. Explore the distribution of happiness across a range of socio-demographic and socio-economic characteristics.
3. What impact does subjective assessment of the present state of a countries economy have in relation to levels of happiness and how has this changed in response to the financial crisis?
4. How do people’s intrinsic and extrinsic personal beliefs and values affect overall levels of happiness in European regions?

Chapter 2 - The Conceptualisation and Measurement of Mental Health and Well-being

2. Introduction

The concepts of mental health and mental illness, despite their widespread use are not easily defined and are often misunderstood. A common misconception is to view mental health and mental illness in terms of opposites; as a dichotomy where mental health is defined by the absence of mental illness and someone is either mentally ill or mentally healthy but not both. Another approach is to view both states as being at opposite ends of a continuum, where an increase in one results in a decrease in the other, making the difference between mental health and mental illness one of degrees. Both of these approaches however, conflate what are two albeit related but distinct dimensions that should be considered and researched in their own right (Scheid and Brown, 2010). This highlights the fact that because someone is diagnosed with a particular mental disorder, does not automatically mean that they are unhappy, sad, anxious, lack motivation and/or confidence for example, and similarly, not having a mental illness does not automatically render an individual 'mentally healthy', or assume that they are happy, confident, self-driven and satisfied either.

A similar view is taken towards the conceptualisation of health more generally and is embodied within the World Health Organisation's definition which states that health is "… a complete state of physical, mental and social well-being, and not merely the absence of disease or infirmity" (World Health Organisation, 2005: 2). This highlights the multidimensional nature of health, where physical, cognitive and social functioning are essential and interrelated components, and it is not simply the absence of disease that dictates someone's health. This definition has been criticised however, not least for the use of the word 'complete', rendering health an ideal-type (Saracci, 1997). A complete state of physical, emotional and social health is for the most part unachievable, although it could be argued that it is the pursuit of health that is more important. Secondly, 'mental and social well-being' are understood to represent 'happiness' and thus less than complete levels of happiness could be considered to be a health problem, which is to confuse mental

health and mental illness as described above (Ustun and Jakob, 2005: 802). Despite these criticisms, two important features that the World Health Organisation's definition establishes is that health should be regarded as a positive entity, and that it should not be defined by the absence of illness. These same principles should also be applied to the formulation of models and theories that are concerned with mental health.

2.1 Subjective well-being

Many of the theories concerned with exploring the structure of mental health have been developed within the field of psychology where two theoretical perspectives have dominated the study of mental health, or mental well-being more precisely; the hedonic approach and the eudaimonic approach (Keyes, 2002). Both of these traditions can be traced back to Greek philosophy. Hedonism is associated with Aristippus and is the belief that the 'goal in life' is to seek to maximise pleasure and avoid or minimise pain, and thus well-being is understood in terms of individual happiness and satisfaction in life (Ryan and Deci, 2001: 144). The eudaimonic approach is associated with Aristotle and holds that well-being involves more than just individual level happiness and instead, 'self actualisation' and realising ones full-potential is stressed as the important features of well-being; that is to be 'fully functioning' (Deci and Ryan, 2006: 2).

Studies that have focussed on hedonic well-being have indicated that well-being is subject to both positive and negative affect, which in turn relates to life satisfaction (Diener, 1984; Kahneman et al. 1999; Diener, et al 2006). A simple analysis would hold that the balance between the number of positive and negative affects dictates or at least predicts someone's level of subjective well-being. However, whether positive and negative affects should be viewed along a continuum or whether they represent two distinct dimensions remains a feature of debate (Horowitz, 2002). Indicators that are associated with positive subjective well-being include 'having confidence, self esteem, feeling enthusiastic, attentive, inspired and loved for example' (Crawford and Henry, 2004: 254).

Indicators chosen to represent negative affect include 'feeling distressed, upset, guilty, hostile, irritable, anxious and nervous'. Individually each of these indicators represents a

single ‘symptom’, and collectively they represent a ‘syndrome’, thus the presence of predominantly positive or negative affects, represents a syndrome of happiness or misery respectively (Ryff, 1989; Pilgrim and Bentall, 1999). These ‘symptoms’ can also be somatic, including weight loss, sleep disturbance, agitation, and loss of libido for example. These symptoms were once associated with the ‘somatic syndrome of depression’, which from a clinical perspective was considered to be related more to biological dysfunction(s) than social dysfunction, or life-events (Lewis and Araya, 2001). However, both of these assumptions have been challenged and there is now less emphasis placed on this distinction between the somatic and neurotic forms of depression, with an acceptance that life events precede both forms of depression, and that medication has also been used successfully to treat both syndromes. However, this is to say nothing about the potential misdiagnosis of what might be normal reactions to stressful life events.

2.2 Psychological functioning

Ryff (1989) argued that empirically, there had been far less research aimed at identifying features that are associated with eudaimonic well-being or psychological functioning. In an attempt to address this problem, Ryff (1989) reviewed many influential psychological theories that were concerned with this approach to well-being including; Maslow’s (1958) conception of self-actualisation; Roger’s (1961) concept of the fully functioning person, Jung’s (1933) theory of individuation; Allport’s (1961) conception of maturation; Erikson’s (1959) psychosocial stage model and Jahoda’s (1958) positive criteria of mental health (see Ryff, 1989: 1069). Using the concepts and descriptions that these aforementioned theories include, Ryff (1989) suggested six dimensions that were consistently associated with psychological well-being; self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life and personal growth (pg. 1071). These dimensions are all associated with the challenges that people face as they strive to realise their full potential in life (Keyes, Shmotkin and Ryff, 2002). This shifts the focus away from the purely subjective experience of happiness to consider more how people feel about their role and place in the wider community. It concerns how people feel about others, and communicate, form and maintain relationships, and the capacity to which individuals can manipulate and have control over their environment and thus facilitate in meeting their

needs and/or desires (Ryff, 1989). Typical indicators associated with psychological functioning include marital status; educational attainment; feelings of security; autonomy and labour-force participation for example.

2.3 Social functioning

Further developing the aforementioned perspective, Keyes (1998) suggests that the above conceptualisation of well-being and including both hedonic and eudaimonic dimensions emphasises the "private features of well-being", but neglects to recognise that individuals are part of wider "social structures and communities, and face countless challenges" as a result of their position within the social structure and experiences within the community (pg. 122). This is a more sociological approach to the causes of mental distress, and where Ryff (1989) consulted the psychological literature to explore the structure of positive mental health, Keyes (1998) considered a variety of sociological theorists including Marx, Durkheim and Merton, in his attempt to identify those features that are associated with an effective social functioning society. Keyes (1998) identified five dimensions that represent potential challenges that relate to optimal social functioning; social integration, social contribution, social coherence, social actualisation and social acceptance (Keyes, 1998: 121). From this perspective, people's mental health, including their emotional well-being and indeed the opportunity to realise their potential and take an active part within society, and furthermore cope with life's challenges, are "constrained or facilitated by the social structures in which they are positioned" (Keyes, 1998: 123). This view of mental health shifts the focus away from the individual and instead views the community and social structures that people are located within as being important for understanding why differences in levels of mental health exist across society, not least exploring the social gradient in mental health and indeed mental illness that prevails (Wilkinson and Marmot 2006).

The above conceptualisation of mental health illustrates the various levels at which positive mental health operates; involving how people perceive and feel about themselves, their life and future, and how they feel about others and interact, communicate, form and maintain relationships, how people function and engage with the wider community, and the

level at which their community is conducive to facilitating "positive feelings and positive functioning in life" (Keyes, 2002: 207). These dimensions are also incorporated within the definition of mental health provided by the World Health Organisation; mental health is "…a state of well-being in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (WHO, 2005: 2). It allows for a broad definition of mental health and one that stresses the importance of individual level happiness and how people perceive themselves and the world around them (subjective well-being), while also considering the value that people place on themselves and their activities within the community (psychological functioning), and where subjective well-being and psychological functioning are both affected by people's engagement within society and their position within the wider social structure (social well-being). From this perspective, mental health is something that everyone *has*. Levels of subjective well-being and psychological functioning may vary, and as Keyes et al (2002) state, "combinations of them relate differently to sociodemographics and personality" (pg. 1007).

2.4 Mental illness

As previously stated, mental illness or mental disorders as they are more commonly referred to, have received more attention and been the focus of more studies than has mental health. This increased attention however, has not led to the development of any one, universally accepted definition of mental illness. Current terminology suggests that mental disorders are treated very much like physical disorders or diseases; with 'symptoms' leading to a 'diagnosis' and subsequent 'treatment' that will hopefully cure, manage or alleviate the condition for the 'patient' concerned (Pilgrim and Rogers, 2010). However, the criteria that is used to diagnose specific mental disorders in this manner has only been available since the 1980's with the 3rd edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III) (APA, 1980) being published by the American Psychiatric Association (APA). Prior to this manual, psychiatrists relied upon symptom checklists whereby thresholds were used to make the distinction between a case of disorder, and like wise, a non-disordered response to various stimuli or life events. However, these checklists did not specify a disorder and instead provided only a measure of the degree of severity of

disorder, which was based on presence of more or less symptoms essentially (Wakefield and Schmitz, 2010: 25). While there were numerous symptom based scales in use, there was no "gold standard" by which mental disorders were diagnosed (Lewis and Araya 2001). Prior publications of the DSM in 1952 and 1968, and similar classification schemes such as the International Classification of Diseases (ICD) (WHO 1992) were criticised on grounds of reliability and validity, and diagnostic descriptions lacked detail (Blashfield et al. 1990).

The anti-psychiatry movement of the 1960's questioned the very concept of mental illness. Thomas Szasz (1960) famously claimed that 'mental illness was a myth' and that psychiatrists were not dealing with problems of the mind (or brain), but problems of living; mental illness "serves mainly to obscure the everyday fact that life for most people is a continuous struggle, not for biological survival…but for peace of mind…or some other human value" (Szasz, 1960: 118). The rising popularity that psychoanalysis had gained entered its 'golden era' in the 1950's and early 1960's with psychoanalysis and psychotherapy being used to treat an ever broadening number of disorders (Rogers and Pilgrim, 2003). However, people with severe mental disorders such as schizophrenia for example, were mainly treated within hospitals with various treatments such as electro convulsive therapy, lobotomies and medication. The diagnosis, subsequent treatment, and conditions in which people were kept in these institutions became the feature of many popular books and films throughout the 1970's. The deinstitutionalisation of the mentally ill that ensued during this period (1960's and 1970's) was facilitated by the introduction of major tranquillisers that allowed many 'patients' to be treated within the community instead of in hospitals. Many have since argued that prisons and hospitals replaced the mental institutions as many ex-patients could not cope following their 'release' (Pilgrim and Rogers, 2003).

It is against this backdrop that the DSM-III (APA, 1980) was developed. Spitzer and Fleiss (1974) who had also been critical of the DSM-I and DSM-II and argued that there were no diagnostic categories for which reliability was high (under the then symptom scales), were to revolutionise the way that mental disorders would be diagnosed and classified. Spitzer and Fleiss (1974) argued that mental disorders should be diagnosed according to their

symptoms and based on observations and not inferences, thus adopting Kraepelin's view of categorising diseases, and further, that any symptom based diagnosis should be theory neutral (Wakfield, 2007). This served several purposes; to respond to those within the anti-psychiatry movement who stated that mental disorders could not be diagnosed in any objective fashion; it would allow for those interested in research to replicate studies; within the United States it allowed for insurance companies to offer cover since an 'illness' was identified, and not merely symptoms or inferred causes; and it was also beneficial for pharmaceutical companies who could produce specific drugs to treat specific symptoms (Mayes and Horowitz, 2005).

As outlined in the DSM-IV (APA, 2000) (although this has not changed since the DSM-III) (APA, 1980) "each mental disorder is conceptualised as a clinically significant behaviour or psychological syndrome or pattern that occurs in an individual…is associated with present distress…or disability…must not be a response to a certain event (death of a loved one for example)…must be considered a manifestation of a behavioural, psychological or biological dysfunction in the individual…neither deviant behaviour nor conflicts between the individual and society" (APA 2000: 30-31). This definition holds that mental illness is something within the individual, not related to the external environment. It not a natural reaction to a stressful life event of life events more generally, but is a 'dysfunction of a mechanism that must be cognitive, motivational, behavioural, emotional, or other psychological mechanism' and disorders were not to be deemed so on the basis of societies dislike or sanctioning of certain behaviours (homosexuality for example), or for particular beliefs (religious or political for example) (Wakefield and Schmitz, 2010: 28).

Wakefield (1992; 2007) suggests that a mental disorder must be a 'harmful dysfunction', and in this respect necessarily includes both a value judgment and a scientific fact. The harmful aspect is judged by others while scientific fact must be biological or chemical and represents a dysfunction, which means that something in the body or brain does not perform the task that is was designed for. A distinction is also made between harmful dysfunctions and benign dysfunctions, where the former results in some disability or loss of freedom, mobility or perception for example. The latter refers to dysfunctions that do not necessarily impede the individual, and thus is not harmful.

Chapter 3 - Methodology

3. Datasets for studying mental health and well-being

There are several examples of large-scale datasets that include a variety of objective and subjective measures and indicators for health and well-being while also recording socio-demographic and socio-economic information. Three such datasets are utilised in this thesis; the British Household Panel Survey (BHPS) (University of Essex, 2010); the 2007 Adult Psychiatric Morbidity Study (APMS) (National Centre for Social Research, 2011); and the European Social Survey (ESS, 2006; 2008; 2010). The BHPS is an annual longitudinal panel survey, where each individual is interviewed in each *wave* (year) of the panel. The APMS (2007) is a repeated cross-sectional epidemiological dataset and like the BHPS, respondents living in the United Kingdom are interviewed. The ESS is also a repeated cross sectional dataset sampling 25 European countries (although only 14 countries are considered in the analyses in this thesis). Three rounds of the ESS are considered. These specific data resources have been chosen on the basis that they (arguably) provide national representative samples of the population in both the United Kingdom, and with regards to the ESS, European countries more generally. There is also a selection of objective and subjective measures of health, well-being and psychiatric morbidity and thus well-suited to investigate and explore trends, patterns and complex relationships between mental health outcomes and social and economic processes.

3.1 Large-scale secondary surveys

As stated previously, there are numerous potential datasets that could be used to explore relationships between mental health and well-being and various demographic, social and economic processes. In a Working Paper published by the Office for National Statistics (ONS), Waldron (2010) reviewed a selection of large-scale secondary datasets, including 12 cross-sectional surveys and 3 longitudinal surveys (with UK based sample populations), 3 cross-sectional European surveys and 3 cross-sectional international surveys that each contained a variety of measures covering mental health, socio-demographic and socio-economic characteristics. At risk of simply providing a list of potentially suitable datasets

that could be used to conduct the analysis presented in this thesis, there are some key datasets that can be singled out. The following datasets provide nationally representative samples of a given population, they include valid, reliable and often several measures for the main variables of interest in this thesis, and are widely used in research concerned with mental health.

Cross-sectional studies sampling UK residents include; the Scottish Health Survey (ScotCen); Health Survey for England (DoH); National Survey for Wales (WAG); British Social Attitudes Survey (NatCen); Adult Psychiatric Morbidity Surveys (OPCS; ONS; NatCen); British Social Attitudes (NatCen); Health Education Population Survey (NHS Scotland). Longitudinal surveys based on UK samples of the population include the British Household Panel Survey (Essex University, 2010); Understanding Society Survey (ESRC); English Longitudinal Study of Ageing (DoH); 1970 British Cohort Study (ESRC). European cross-sectional surveys include the European Social Survey (EC) the European Quality of Life Survey (EF); and Eurobarometer (EC). International cross-sectional datasets that could have been utilised include the Gallup World Poll; World Values Survey (WVS) and the WHO's World Mental Health Surveys (WMH). This list of potential datasets that contain objective and subjective measures of mental health and well-being, and socio-demographic and socio-economic indicators is by no means exhaustive. There are literally hundreds of data resources that could be used to conduct research concerning mental health and socio-structural inequality.

There are numerous well-established data repositories where these datasets can be accessed such as the UK Data Archive (UKDA); UK Data Service (UKDS); Economic and Social Data Service (ESDS), the Organisation for Economic Co-operation and Development (OECD) and World Health Organisation (WHO) for example. Of all of the datasets listed in the section above, the BHPS was found to include the most measures of subjective mental well-being, and of the European datasets, the ESS contained the most indicators for subjective mental well-being (Waldron, 2010: 14). The Adult Psychiatric Morbidity Surveys (also referred to as the OPCS/ONS Surveys of Psychiatric Morbidity) include fully-structured interview schedules that adhere to diagnostic criteria that can be used to screen for a variety of common mental disorders such as anxiety, depression, post-

traumatic stress disorder (PTSD), substance dependency disorders, and also more severe mental illness and psychosis, including schizophrenia and personality disorder for example (McManus et al. 2009: 11).

3.1.1 e-Health and research initiatives in health inequality

The information and communication technology (ICT) revolution has transformed the way information about individuals around the world is collected, stored, managed and analysed. As a result, huge volumes of data are held by numerous organisations, institutions and governments, "each with their own rules and guidelines concerning access and usage policies, serving various communities" and purposes (McCafferty et al. 2010: 3846). E-mental health refers to the use of information and communication technologies such as the internet, online resources, social media and smart-phone applications, in ways that can support and improve mental health, either directly (from an individual's perspective), or indirectly, through research for example (Mental Health Network, 2013). E-health, and e-mental health requires an efficient e-infrastructure, which, as the Research Councils UK (RCUK) (2010) define as a combination of digitally-based technology (hardware and software), resources such as data, services and digital libraries, communications (protocols, access rights and networks), and the people and organisational structures that facilitate collaborative research across various fields and disciplines (RCUK, 2010: 3).

Linking data from across locations and disciplines requires not only collaboration, but also safe, secure environments and infrastructures that facilitate the sharing and exchange of data, while at the same time addressing operational and ethical considerations that are raised. The challenges that result from such projects are especially complex where health and e-health research is concerned. While large-scale data repositories such as the UK Data Archive and organisations including the OECD and World Bank offer access to large volumes of high quality data, the type of data that researchers interested in health related topics require is often not as readily available. Compliance and security concerns can limit the type and amount of information that can be accessed, furthermore, where data is available, it is very often found across a variety of locations and systems. Exploiting and developing existing information systems that would allow for information to be shared

across the NHS, local authority and third party/voluntary sector for example remains a feature of government policy.

Some of the complexities involved in linking various types of health data across disciplines and institutional boundaries will be highlighted with particular attention being placed on Scottish wide strategies including the Scottish Health Informatics Programme (SHIP), the Digital Social Research (DSR) project and various research nodes that are attached to the DSR including the Oxford e-Social Science (OeSS); Generative Social Science (GENeSIS); Centre for Multilevel Modelling (CMM); Methodbox; Life Guide; Policy Grid; Digital Replay System (DReSS); and Data Management through e-Social Sciences (DAMES). Examples of existing networks using integrated systems, most notably in the field of diabetes, cancers and viruses of the blood, offers insight into the potential benefits associated with this type of approach to health and healthcare. The wider applicability for such initiatives in other health related fields, with an emphasis on mental health research will be outlined. A common theme that pervades all of these e-health strategies is the recognition that only by sharing knowledge and resources, can the potential for exploiting vast amounts of data be fully realised.

3.2 Measures of health and well-being in surveys

Having provided examples of surveys in which measures of mental health and well-being, psychiatric morbidity and mental disorder are available, with often numerous measures for the same phenomena, I will now consider some of these indicators in greater detail before elaborating on the specific measures that are utilised within this thesis. As outlined in chapter 2, there are various ways in which mental health and well-being, psychological distress and mental disorders are conceptualised (Goldie et al. 2011). This is reflected in the wealth of measures used to capture different aspects and dimensions of mental health within surveys. As will be discussed in the first instance, some measures are designed to screen for specific mental disorders within the general population, and are created using standardised psychiatric diagnostic criteria. From this perspective, these measures are regarded as diagnostic screening instruments. These diagnostic measures generally take the form of semi-structured and fully-structured interview schedules. Examples of both

measures will be discussed first. Measures that are used to screen for non-specific mental disorders, more commonly referred to as psychiatric morbidity, will then be outlined. While not diagnostic, through the application of clinical thresholds, these measures can be used to distinguish between 'cases' (probable psychiatric morbidity) and 'non-cases'. Measures that are used to provide an indication of one's well-being will be discussed, where often single-item questions relating to overall happiness or life-satisfaction are included, and others which provide measures of positive and/or negative affect will be outlined.

3.2.1 Diagnostic measures for use in surveys

There are two internationally recognised standardised diagnostic manuals that psychiatrists use to assist with the diagnosis of mental disorder; the Diagnostic and Statistical Manual of Mental Disorders (the most recent edition being the DSM-5), published by the American Psychiatric Association (APA, 2013) and the World Health Organisation's International Classification of Diseases (the most recent edition being the ICD-10) (WHO, 1994). Both manuals are used around the world, although the DSM is favoured in the United States and the ICD is used extensively across Europe. The DSM only covers diagnoses of mental disorders while the ICD covers all health related disorders. Collaboration between the APA and the WHO have ensured that the DSM and ICD are very similar in terms of their diagnostic criteria and classification of mental disorder (APA, 2009). Both of these manuals were designed to be used by psychiatrists and other suitably trained clinicians, and not to be applied 'mechanically by untrained individuals or in a cookbook fashion' (APA, 1994: 23). There are also different versions of both manuals that are for use in clinical practice, educational and service use, and a version that is for use for research purposes (which should be used in conjunction with the clinical version) (WHO, 1992: 1).

3.2.2 Generating semi-structured and fully-structured interview schedules

There are two different methods of creating diagnostic interview schedules; developing semi-structured or fully-structured interview schedules. In order for such measures to be considered diagnostic they must incorporate DSM and/or ICD diagnostic criteria (Brugha

et al. 1999a). With regards to the semi-structured approach, psychiatrists are required to administer such interviews where they can use their knowledge, clinical judgement and ask further questions where necessary. From this perspective, the semi-structured approach is thought to best reflect the clinical diagnostic process, since it does not sacrifice clinical judgement and cross-questioning as part of the interview (Brugha et al. 1999a). Due to the need for trained clinicians to administer semi-structured interviews, these measures tend to be found in the context of clinical settings, or in studies concerning a small number of cases. Where they are included in general population surveys (or non-clinical samples more generally), they tend to be reserved for a sub-sample of the survey population, or for individuals who have been identified as having potential psychiatric morbidity in phase-one of the interview process (Bebbington et al. 1998). In this manner, the time and costs associated with employing psychiatrists to administer semi-structured interviews can be minimised, whereby respondents unlikely to have a mental disorder can be excluded from such follow-up interviews.

The second way in which interview schedules can be generated from diagnostic criteria is to develop fully-structured interviews. This method eliminates the need for clinically-trained interviewers to administer such interviews and reduces further the costs associated with including these measures in a large-scale survey for example (Brugha et al. 1999a). Fully-structured diagnostic measures can therefore be used to explore the prevalence of mental disorder in the general population, and help to identify individuals and groups who are more or less susceptible to developing mental disorder than others. Moreover, it is often through the use of fully-structured interviews that individuals within a large sample are identified as being likely to merit a second (i.e. semi-structured) diagnostic interview with a trained clinician (at phase two of a survey for example). This strategy again serves to limit both cost and time required to collect data from various populations.

3.2.3 Semi-structured diagnostic interview schedules

There are several examples of semi-structured diagnostic interview schedules that have been and continue to be developed and utilised within surveys. While the purpose of these measure are to detect and diagnose mental disorder within a variety of populations, it is not

feasible, or indeed at times desirable to screen for all potential mental illnesses included in the DSM or ICD for example (Brugha et al. 1999a). Instead, semi-structured interviews are often designed with the purpose of detecting or screening for a particular type of disorder, or selection of disorders. This reduces the length of interview schedules and by extension, reduces the cost and time required to conduct semi-structured interviews. Examples of well-established semi-structured diagnostic interview schedules include the Present State Examination (PSE) (Wing et al. 1974), which was the measurement choice for Brown and Harris (1978) when they conducted their widely cited study on the *Social Origins of Depression* using a community-based sample (Marshall, 1998). This measure was developed over a period of more than thirty years and was to form the core of the Schedules of Clinical Assessment in Neuropsychiatry (SCAN) (Wing et al. 1990; Bebbington, 1992: 255) where diagnostic criteria from both the ICD-10 and DSM-III were incorporated (Wing, 1996).

Another semi-structured clinical interview is the International Personality Disorder Examination (IPDE) (Loranger et al 1997). The IPDE is used for assessing personality disorders which are found within the DSM-IV and ICD-10 classification systems. The IPDE was actually developed from the Personality Disorder Examination (PDE) (Loranger, 1988) and was adapted for international use (Loranger et al. 1997: 52). The Structured Clinical Interview for DSM disorders (SCID) (Spitzer et al. 1990a; 1990b) represents another example of a semi-structured interview schedule designed to be administered by psychiatrists and other suitably trained clinicians. Since its inception there have been several revisions and newer versions of the SCID for use within different contexts and samples. The SCID-I/P (Patient Edition for DSM-IV-TR) (First et al. 2002a) for example, was designed for use with adults identified as being psychiatric patients. The SCID-I/P (w/ psy screen) (Patient Edition with psychotic screen) (First et al. 2002c) is utilised for patient populations when psychotic disorders are thought to be rare (unlikely) but are nevertheless screened via a shorter questionnaire (than the SCID-I/P) that asks respondents about psychotic symptoms (Spitzer et al. 1992: 626). The SCID-I/NP (Non-patient Edition for DSM-IV) (First et al. 2002b) is for use in studies where subjects are not identified as being psychiatric patients, such as general population/household/community/primary care settings for example. There is also a Clinical Version (SCID-CV) (First et al. 1996); a

Clinical Trials Version (SCID-CT) (First et al. 2007), and another version for identifying DSM-IV Axis II personality disorders (SCID-II) (First et al. 1997).

The Patient Health Questionnaire (PHQ-9) (Kroenke and Spitzer, 2002) was developed in the United States and has been widely used by clinicians to diagnose, monitor and measure the severity of depression in clinical and primary care settings. It is also considered to be a good diagnostic tool for distinguishing between depressed and non-depressed individuals in the general population, without the need for face-to-face interviews with clinically trained interviewers (Martin et al. 2006). The PHQ-9 was developed from another screening tool, the Primary Care Evaluation of Mental Disorders (PRIME-MD) (Spitzer et al. 1994). The PRIME-ED was a 26-item self-completion questionnaire that screened for 'potential' presence of five DSM-IV disorders in primary care settings (Spitzer et al. 1999). If a 'patient' screened positive for one or more of these disorders, a clinician would then ask additional questions to make a diagnosis (Kroenke et al. 2010). The PRIME-ED, while a reliable and valid measure, was time consuming and did not on its own provide actual diagnosis, rather, probable diagnosis from which point a trained clinician would take over. It was against this backdrop that the PHQ-9 and other versions developed.

The 9-items in the PHQ-9 reflect clinical diagnostic criteria used in the Diagnostic and Statistical Manual for Mental Disorders (DSM-IV) and can screen, diagnose and measure the severity of depressive disorders (Kroenke and Spitzer, 2001). The 9-items relate to questions about experiencing loss of interest/pleasure; feeling depressed/hopeless; sleep disturbance; fatigue; appetite disturbance; self-loathing/failure; concentration problems; moving slowly (or being fidgety); and suicide ideation/self-harm. A tenth question is also included, although this is not scored, which asks respondents who have stated that they have been affected by any one of the items on the list, to rate how difficult their mental health concerns have made it for them to work, take care of things or get along with others. In terms of scoring, respondents are asked to rate on a scale of 0 (not at all) to 3 (nearly every day) whether they have been bothered in the previous 2 weeks by any of the nine items. Scores therefore range from a minimum of 0 to maximum of 27 where higher scores correspond with presence and increased severity of symptoms associated with depressive disorders (Martin et al. 2006). Kroenke et al. (2001) stated that a score of $\geq$ 10 predicted

the presence of major depressive disorder, and four thresholds of 5, 10, 15 and 20 were indicative of mild, moderate, moderately severe, and severe depression respectively (ibid: 606). While Martin et al. (2006) and Kocalevent et al. (2013) have found that the PHQ-9 is a valid and reliable diagnostic tool for identifying people with depression and anxiety disorders in the general population, its use within large-scale population surveys is limited (Kocalevent et al. 2013: 551).

The Hamilton Depression Rating Scale (HAM-D) was developed in 1960 by Max Hamilton and was designed to be administered by trained clinicians to measure severity of depression in patients who have had a previous diagnosis for major depressive disorder, and to assess the effectiveness of subsequent treatment (Hamilton, 1960). Since its publication, the HAM-D scale has been used extensively across the world and has been revised at various points as researchers adapted it for their own studies, and indeed to improve the psychometric properties of the scale (Williams, 2001). In its original form the HAM-D consists of 21-items, of which only 17 are scored, with the latter four items (diurnal variation, depersonalisation/derealisation, paranoid symptoms and obsessional/ compulsive symptoms) thought not to be associated with 'part of the disease', too infrequent in depression or not reflective of severity of symptoms (Williams, 2001). With regards to the 21-items, ten items have scores that range from 0 to 4; nine have scores that range from 0 to 2 and two range from 0 to 3. In each instance, higher scores represent more severe symptoms (in the past week). Scoring instructions state that only the first 17-items should be scored meaning that scores range from 0 to 52 with suggested thresholds as follows; scores of 0-7 (normal), 8-13 (mild depression), 14-18 (moderate depression), 19-22 (severe depression) and $\geq$ 23 (very severe depression) (Romera et al. 2011: 133). The scale rates anxiety symptoms, psychic retardation, concentration difficulties and paranoid and suicide ideation. Anhedonia is poorly assessed and other important symptoms associated with major depression are not measured; feelings of worthlessness nor 'reverse vegetative states' (overeating or hypersomnia for example) are not measured (Bagby et al. 2004).

3.2.4 Fully-structured interview schedules

There are several other examples of semi-structured interview schedules that can be cited, however, their feasibility in terms of cost and time limit their usage within large-scale general population surveys. Semi-structured interviews are therefore generally found in clinical samples or surveys with a relatively low number of cases. It is important however, to be able to assess the mental health and well-being of the general population, and moreover, to be able to screen for mental disorders within the community. It is for these reasons that fully-structured interview schedules were developed. They are both cost and time effective since lay-interviewers can administer such interviews. Fully-structured interviews do not allow interviewers to ask probing questions (since clinical judgement is not required or desired). Lewis et al. (1992) states that many epidemiologists feel that this is actually an advantage (*ibid:* 466). Having to ask further questions in the context of a fully-structured interview suggest that the measure is not itself an adequate one if further questions are required. Lewis et al. (1992) argues that clinical judgement itself represents a potential source of reduced reliability and thus by eliminating this from the diagnostic interview process, observer variation can also be eliminated. However, Brugha et al. (1999a) recognises that while measurement error resulting from interviewer variations may undermine reliability, they argue that semi-structured diagnostic interviews are more able to systematise the clinical diagnostic process than fully-structured interviews can.

There are numerous examples of fully-structured diagnostic interview schedules that have been designed to be administered by lay-interviewers. One of the first examples includes the Diagnostic Interview Schedule (DIS) (Robins et al. 1981). This was developed in the US for use in the Epidemiologic Catchment Area (ECA) Study (Robins and Regier, 1991), a community-based survey conducted in five neighbourhoods in the US. However, the diagnoses in the DIS were not entirely based on the diagnostic criteria in the DSM-III (Kessler and Ustun, 2006). The WHO expanded on the DIS and developed a diagnostic measure that incorporated ICD-10 diagnostic criteria, resulting in the WHO's Composite International Diagnostic Interview (CIDI) (WHO, 1990). In its first version the CIDI incorporated criteria from the ICD-10 (WHO, 1992) and the Revised Third Edition of the DSM-III-R (APA, 1987). In the CIDI Version 2.1 (WHO, 1998) and the CIDI Version 3.0

(WHO, 2004) diagnostic criteria from the ICD-10 (WHO, 1991) and the DSM-IV (APA, 1994) are incorporated. Diagnoses are scored by computer in both the DIS and CIDI which allows for estimates of the prevalence of mental disorder in large-scale epidemiological studies to be generated (Robins and Cottler, 2004).

3.2.5 Non-diagnostic measures for screening for psychiatric morbidity

As has been discussed in the sections above, including semi-structured interviews in large-scale surveys is not cost effective in most instances. Fully-structured interview schedules on the other hand can be more cost effective since they do not require clinically trained interviewers to be administered. Prevalence of mental disorder in the general population can then be estimated, where fully-structured interviews might be used in phase one of an interview process and respondents who are identified as having potential psychiatric morbidity in the first instance, can be selected for a second-stage semi-structured interview with clinicians to confirm diagnosis. However, over the past four decades there has been much emphasis placed on the important role that mental well-being has in protecting people from mental disorder and being a source of resilience (Dolan et al. 2011). In order that mental well-being can be measured it is important to be clear about what mental well-being actually is and how it can be operationalised.

Measures designed to capture mental well-being cover different dimensions including 'global evaluation', 'domain evaluation', 'general affect', 'domain-specific affect' and 'psychological well-being' (Waldron, 2010: 10). Global evaluation questions are those which try to capture a measure of one's experience of life (*ibid:* 10), which includes questions such as, '*overall, how satisfied with life are you'*. Domain evaluation questions try to generate measures that capture one's feelings about certain aspects of their life, such as at school, work, home, relationships, their neighbourhood and local environment for example. Such questions might include '*overall, how satisfied are you with your job/boss/ partner/local amenities?'* General affect questions relate to measures that attempt to capture one's feelings and emotions, '*overall, how happy are you?'; 'do you feel/have you felt sad?'*. Domain-specific affect questions are those which measure one's feelings and emotions about different aspects of their life (such as those aforementioned) and may take

the form of for example, ‘how happy (or sad) do you feel in your job/neighbourhood/ relationship/neighbourhood?’ Psychological well-being questions, as stated by Waldron (2010), are those that attempt to identify the underlying factors that influence mental well-being (*ibid:* 10).

3.3 Measures of mental health operationalised within this thesis - The Revised Clinical Interview Schedule

One of the measurements that are utilised within this thesis is the Revised Clinical Interview Schedule (CIS-R) (Lewis et al. 1992). This is a fully structured diagnostic interview schedule which was developed out of a semi-structured interview, the Clinical Interview Schedule (CIS) (Goldberg et al. 1970). The CIS-R was designed to be administered by lay interviewers and for use in not only clinical and primary care settings, but also for use in the general population. The CIS-R assess 14 types of neurotic symptoms (somatic symptoms; fatigue; concentration; sleep problems; irritability; worry about physical health; depression; depressive ideas; worry; anxiety; phobias; panic; compulsions; and obsessions) (McManus et al. 2009: 28). Each respondent is asked to rate of a scale of 0 to 4 (except for depressive ideas which is a scale of 0 to 5) whether they have experienced any of the the 14 symptoms in the past week prior to the interview. A zero indicates no experience of such symptoms and 4 indicates experiencing a symptom ‘almost every day’. The answers to these questions are scored, generating a continuous scale that ranges from 0 to 57 that measures whether a respondent meets the criteria for specific disorders and also provides a measure of the overall severity of the symptoms (McManus et al. 2009: 28).

Commonly applied thresholds dictate that a score of 12 or more indicates a significant level of symptoms but unlikely to merit psychiatric treatment, whereas scores of 18 or more indicates a significant level of symptoms that are likely to require treatment (McManus et al. 2009). ICD-10 diagnoses are generated through a computer algorithm and can diagnose six types of common mental disorder; generalised anxiety disorder GAD; depressive episode; phobias; obsessive compulsive disorder OCD; panic disorder and

mixed anxiety and depression. It also has a continuous scale that measures the overall severity of neurotic psychopathology (McManus et al. 2009: 28).

Validity and reliability studies have been carried out on the CIS-R where it has been compared against the Schedule for Clinical Assessment in Neuropsychiatry (SCAN) by Brugha et al. (1999b) using a household sample from the United Kingdom. It has been compared against the Composite International Diagnostic Interview (CIDI) using a community-based sample from Australia (Patton et al. 1999) and it has also been compared against the SCID (Subramaniam et al. 2006). The CIS-R has also been translated into several languages and has been found to be both a valid and reliable measure for detecting minor (or common) mental disorders in the general population.

3.3.1 The General Health Questionnaire

The General Health Questionnaire (GHQ) was developed in the 1970's by Goldberg and in its original form comprised of 60 items, each relating to a symptom or behaviour that was associated with anxiety or depression. The scale has been revised and shortened on numerous occasions and now includes; GHQ-30; GHQ-28; GHQ-12. The 12 item General Health Questionnaire (GHQ-12) (Goldberg et al. 1988) was designed to screen for (non-psychotic) psychiatric morbidity in the general population. It is a widely validated measure and has also been found to be reliable (Hankins, 2008). The scale consists of 12 questions, each relating to a different mood state. Respondents are asked to rate on a four point scale, whether they have experienced any of the 'symptoms' in the past week. Zero (0) indicates they have not experienced the symptom, (1) indicates 'no more than usual', (2) indicates 'rather more than usual' and (3) indicates 'much more than usual'. This is the Likert method of scoring the responses where a continuous scale from 0 to 36 is created. High GHQ-12 scores indicate higher levels of psychological distress (or poorer mental health more generally), where a threshold of 12 or more is indicative of potential minor psychiatric morbidity (Goldberg and Huxley, 1992). The GHQ2 method of scoring codes all items 0,0,1,1. This results in a scale from 0 to 12, where scores of 3 and more are considered to be indicative of potential psychiatric morbidity (Hankins, 2008: 355). These measures are used for the analyses conducted using the BHPS in this thesis.

3.3.2 Global evaluation measures, happiness

The third type of measure used in this thesis is the single item measure for happiness ('happy') which is scored on a 10-point Likert scale from (0 to 10) where 0 indicates a person is 'extremely unhappy' and 10 means a person is 'extremely happy'. Satisfaction with the present state of the economy is also measured on a 10-point Likert scale, where 0 indicates that a person is 'extremely dissatisfied' with the country's economy and 10 infers that a person is 'extremely satisfied' with the present state of their country's economy'.

With regards to indicators that measure people's personal values and beliefs. There are several questions, or more precisely statements, scored on a 6-point Likert scale (1 to 6), where respondents are asked to rate the extent to which they agree with each statement, where 1 indicates the greatest tendency (very much like me) and 6 indicates the least tendency (not like me at all). In this thesis (chapter 8), the following values and beliefs are included; whether it is important to, *be creative; rich/materialistic; treat people equally; show abilities and be admired; understand different people; make your own decisions and be free; help others and care for other people's well-being; be successful and that other people recognise such success; seek adventure and have an exciting life; get respect from others; follow traditions and customs;* and *seek fun and things that give pleasure in life.* In keeping with Georgellis (2009) I have recoded the personal values variables into dichotomous measures where 1,2 or 3 = 1 (agreeing) and 4 = (no, not like or agreeing).

3.3.3 Other variables used throughout the thesis

A range of socio-demographic and socio-economic factors will be controlled for in all of the analyses in this thesis. For example, age, gender, educational attainment, marital status, household circumstances, income, health status, employment status and previous episodes of unemployment, are included in analyses. In each instance, these measures are described in the chapters within which they feature.

3.4 Statistical approach

Available population survey data is exploited including the British Household Panel Study and the Adult Psychiatric Morbidity Survey from the UK, and the European Social Survey (covering 25 countries). Variables are operationalised that cover measures of psychiatric morbidity and self-reported mental well-being, and explanatory factors considered that include age, gender, family circumstances, employment status, occupational position, education, income and other measures of health and well-being. Descriptive analysis and statistical modelling are used throughout as devices to explore the influence of explanatory factors upon psychiatric morbidity and self-reported mental well-being. Models used include multiple and logistic regression, ordered logistic regression, and multilevel models using random and/or fixed effects. In the following sections

3.4.1 Hierarchical nature of survey data and its implications for analysis

A common feature of survey data that is utilised within the social sciences, and indeed other fields where observational data is routinely collected and analysed, is that the data is hierarchically structured; or in other words, observational units are clustered within higher level groups (Goldstein, 2011). For researchers who are interested in exploring the social world, it is not difficult to think of examples of what might be described as 'naturally' occurring hierarchical structures within society. For example, individuals nested within households; households nested (or grouped) within neighbourhoods; and neighbourhoods nested within regions. Other examples could include patients who are assigned to doctors, who are themselves nested within hospitals; or employees nested within firms and so forth (Steele, 2008). If researchers wish to make statements and draw conclusions about a (wider) population based on a sample drawn from that population, then it follows that such hierarchical structures, if present, should be recognised and where possible captured (Plewis et al, 2010). It is to this end that research designs and sampling strategies have been developed, where various methods are employed depending upon the intended nature of the survey and population of interest.

From a simple random sampling, where all members of a given population have the same chance of being chosen; or stratified random sampling, where the population is divided into mutually exclusive groups (or strata), and where simple random sampling is then performed on each strata to obtain the final sample; to cluster sampling, which involves taking a simple random sample of groups that have been identified within the population (Sturgis, 2004).

Many surveys, including the BHPS, employ multistage sampling designs, where clusters (Primary Sampling Units PSU's) are sampled in the first stage, then sub-clusters in the second and so forth, until the units of analysis are sampled in the final stage (Rabe-Hesketh and Skrondal, 2006: 805). Units clustered within higher levels or groups, such as those described above, tend to be more like those within the same group than across groups. Simply stated, individuals (level 1) who live in the same household (level 2), or pupils (level 1) in the same classroom (level 2) will generally be more like those who live in the same household, or are in the same class than they are compared to people in different households or different classes for example. This increased homogeneity may be the result of shared experiences and social, political and economic similarities that units within the same group have (Hox, 2002). In the case of panel data, where we have repeated measurements from the same unit over time, then this dependency is even more likely, since observations at level 1 are nested within the individual (at level 2). That is to say that an individual's GHQ-12 score if measured at wave 1, will be correlated with their GHQ-12 score at wave 2. In each instance, observations are likely to be correlated, which is to violate a key assumption of regression analysis which states that all observation are assumed to be (and are treated as being) independent (Berrington, 2006: 4). Failing to account for such clustering of data leads to biased and unreliable estimates, where standard errors are underestimated and test statistics are unreliable, for instance increasing the risk of erroneously finding significant results where there are none (Skinner and Vieira, 2007).

In order to conduct analysis of hierarchically structured data, such as panel data, where the assumption of independence of observations may not hold, several techniques and statistical models have been developed, including multilevel modelling. There are several different types of multilevel models that researchers can choose from, depending upon the

nature of the data and the research questions they wish to address. In broad terms, multilevel models not only allow dependency between observations, they also allow us estimate the extent to which each of the hierarchies or levels (controlled for in our model) affects the variation in our response (in this case GHQ-12 scores). More formally, multilevel modelling techniques can be used to explore the effects of both "group and individual level variables on individual level outcomes while allowing for the non-independence of observations within groups" (Roux, 2002: 588). We use the examples below to illustrate the use of multilevel models in this research and begin by estimating a variance components model, followed by a random intercept model, and finally a random intercept and random slopes model.

3.4.2 Variance components models: assessing variation at two-levels

Table 1. Comparing variance components models. Variance in the response (GHQ-12 Likert) is partitioned between-individuals (level-2) and within-individuals (level-1)

	Model 1 (null All)	**Model 2 (null Male)**	**Model 3 (null Female)**
	b (se) [95% CI]	b (se) [95% CI]	b (se) [95% CI]
GHQ-12 (Likert)			
_cons	11.27***	10.57***	11.89***
	(0.03)	(0.04)	(0.04)
	[11.21,11.32]	[10.50,10.65]	[11.81,11.96]
sigma_u (var between subjects)			
	3.59***	3.36***	3.68***
	(0.02)	(0.03)	(0.03)
	[3.55,3.63]	[3.30,3.42]	[3.61,3.74]
sigma_e (var within subjects)			
	4.26***	3.92***	4.52***
	(0.01)	(0.01)	(0.01)
	[4.24,4.27]	[3.90,3.94]	[4.50,4.55]
rho/icc	0.42	0.42	0.40
N	159432	73481	85951
N_g	23385	11160	12225
bic	950246.62	426364.79	521842.86
ll	-475105.34	-213165.59	-260904.39
LR Test of sigma_u=0			
Prob>=chibar2 =	0.00	0.00	0.00

Legend p<0.05 * p<0.01** p<0.001 ***
Source: BHPS 1991 - 2008

Turning attention to the results from the three variance components models presented in Table 1. The purpose of these models is to estimate the amount of variation in our response that is present at different levels of the data, or more precisely, to explore how much of the total variance in GHQ-12 scores is due to differences between units (level-2) and how much is due to differences across time for the same units (within-unit, level-1 variation) (Marchenko, 2006). So as to provide a baseline estimate for this variation, only the response variable (GHQ-12 Likert) is included in these models and are therefore the null, or unconditional models. The regression command in Stata13 (StataCorp, 2013) has been used to fit the models and we also ask for maximum likelihood estimation (MLE) as opposed to the default restricted maximum likelihood (REML).

As Table 1 indicated, there are a total of 159,432 observations (N) (repeated measures of GHQ-12) at level-1, nested within 23,385 individuals (PID) at level-2, which is therefore the grouping variable. There are slightly fewer male participants in the sample than there are female; for males a total of 73,481 observations are nested within 11,160 male participants while 85,951 observations are nested within 12,225 individual females. There is a minimum of one observation (equivalent to one wave or person-year observation) per group (individual) in the sample, and a maximum of 18 observations per group. The average number of observations for men is 6.6 while for females this figure is 7. Therefore this is an unbalanced dataset as there is missing data; that is to say that GHQ-12 scores are not observed for every individual across the entire 18 waves of the survey.

At the top of Table 1. in the row headed GHQ-12 (Likert), the fixed part estimates are displayed, which shows the constant (_cons) or intercept of our response variable in the absence of any predictors. The constant term therefore provides the overall mean GHQ-12 score for the entire sample (all person-year observations for each individual) (mode 1); the overall mean GHQ-12 score for men and women are also shown separately (model 2 and model 3 respectively). These estimates are similar to those which would have been obtained if a simple single-level (OLS) regression model (without any explanatory measures) had been fitted. The resultant regression line for the male and female sample that is estimated is displayed in Figure 1 (entire sample), Figure 2 (male sample) and Figure 3 (female sample). In each instance the black line in the centre of the graph

represents the overall mean GHQ-12 score across the sample period for all units. The mean GHQ-12 score for the entire sample (in the absence of any predictors) is 11.27. Males have a slightly lower mean GHQ-12 score at 10.57 than females, which is 11.89. With regards to the 95% confidence intervals around the mean GHQ score for each of the models, none of them include the value of 12 which frequently serves as the threshold score for which potential psychiatric morbidity is considered to be present.

In the second and third rows of Table 1. under sigma_u and sigma_e respectively, the estimates for the random-effect parameters are displayed. These represent the variance (or error) components in the model and are independent, so that there are two separate estimates of the variance between-subjects (sigma_u / level-2) and within-subjects (sigma_e / level-1). Each individual (group) has their own line which is parallel to the overall regression line, and so what is being estimated in the random part of the model is the between-subject standard deviation, which is the estimated deviation of cluster/group (level-2) means (sigma_u) from the overall sample means (_cons). The latter, (sigma_e) is the within-subject deviation and represents the average deviation of the repeat observations at level-1, from the cluster or group means. Therefore the values for each group can vary around the sample mean; and unit values within groups can vary around their own means. Looking at the results present in Table 1, in Model 1 for example, the estimated standard deviation between-subjects is (sigma_u = 3.59) with a 95% confidence interval of 3.55-3.63, while the within-subjects standard deviation is estimated at (sigma_e = 4.26) with a 95% confidence interval of 4.24-4.27. From these estimates it is clear that there is more within-subject variation than there is between-subject variation, which may seem a strange proposition since one would expect that multiple observations from the same individual would be more similar than multiple observation from another individual. However, this reflects that people often change their feelings. GHQ-12 scores may vary depending upon several unobserved/unobservable factors such as the time/day/week/month that someone is interviewed; their mood and personality for example.

From the two random-effects parameters estimated in the model, the intraclass correlation coefficient (ICC), also referred to as rho (ρ) is calculated. This is achieved by squaring the sigma_u and sigma_e in order to obtain the variance estimates, then dividing the between-

subject variance with the within-subject variation plus between-subject variation. The resultant ICC statistic shows the proportion of variation in the response that is present at the higher level (groups) and by implication, how much variation in the response is at level-1 (repeated observations). Strictly speaking, where the ICC statistic approaches 1, this is evidence that there is a lot of clustering of level-1 units in level-2 groups. Thus a high value of *rho* suggests that units within each group are similar but that there is a lot of difference between groups and the values of the response variable are therefore determined to a large extent by which group the units belong to. Alternatively, a low value ICC/rho (reaching or approaching zero) would indicate that there is no (or very little) clustering of units within groups; thus units within each group may be dissimilar but that there is not much difference between groups. This would mean that the value of the unit response is not determined by the group that that unit belongs to. Within the social sciences, an ICC statistic of between .05 and .25 is considered to be evidence enough that clustering at higher levels of the data is present and should be taken into account (Snijders, 2012: 12). To be clear, if most of the variation is between individuals, then individuals change little over time and the ICC statistic would be large. On the other hand, if most of the variation exists within individuals, then the ICC statistic will be small (Berrington et al, 2006: 31).

Comparing the ICC statistic across the male (model 2) and female (model 3) models (Table 1.), approximately 42% and 40% respectively, of variation in the response is due to differences between groups (cross-sectionally), while the remaining 58% and 60% of variation in the response is due to differences within units (longitudinally). These ICC estimates indicate that variation in GHQ scores between individuals (level-2) is considerable, and must be taken into consideration when fitting subsequent models, but also that GHQ-12 scores within individuals over-time are far from time-invariant. The Likelihood Ratio test (LR Test) formally tests the (null) hypothesis that there is no group level variation in the response, or in other words, that the variance in the response between individuals is equal to zero (sigma_u = 0). The results of the LR test for each model are shown in the penultimate row of the table. As the p-value in each instance is <0.05 the null hypothesis rejected and we can be satisfied that the data is indeed clustered, specifically, that level-1 (repeated observations) are clustered within level-2 units (individuals) and so must therefore account for the hierarchical structure of the data in subsequent models and

the use of multilevel modelling techniques are justified. If the p-value had been >0.05, the null hypothesis would fail to be rejected which would indicate that there was no clustering of level-1 units in higher level-2 units. From this perspective, a simple OLS regression could be used to model the data.

3.4.3 Random intercept model

Having obtained baseline estimates of the variance in the response at the lower level-1 (within-subjects over time) and higher level-2 (between-subjects), and calculated the intraclass correlation coefficient (ICC), a selection of explanatory measures are now included in the models. In doing so, a random intercept model (RIM) is fitted, which essentially combines a single-level (OLS) regression model with a variance components model (VCM). Similar to the variance components model, each group (individual in the dataset) has their own line (regression line) which is fixed, meaning that the slope runs parallel with the overall regression line. Thus, in the fixed part of the model, the estimate of the constant intercept (_cons) is displayed, which represents the overall regression line (when values of covariates equal zero), and as would be done in a simple linear regression, we estimate a beta coefficient for each of the regressors. The results are presented in Table 1.1)

Separate intercepts are estimated for each subject (at level-2) and are therefore allowed to vary across groups; hence the random intercept model. More succinctly, random intercept allows the value of the response to vary across groups (individuals and thus level-2 of the data), and the "transitory component" or individual residual error varies over occasions within groups (individuals and thus level-1 of the data) (Skrondal and Rabe-Hesketh, 2011: 277). This means that although fixed and thus running parallel to each other, the regression line and group-lines slope to fit the data; they are no longer flat in other words. In the random part of the model, as previously done, between-group (level-2) variance and within-group (level-1) variance are estimated. The former is a measure of the deviation between the group-line (one for each group) and the overall regression line, while the latter is a measure of the average deviation within groups from their overall (individual) group mean over time. Having estimated null models, it is possible to compare the ICC values

from the models in Table 1.1 with those in Table 1. and find out how much variation at the group-level is explained by the inclusion of the level-1 explanatory measures. For ease of comparison, both the standard deviation (sd) and variance (var) estimates in the random-effect parameters section of Table 1.1 are reported, where the latter is simply a function (squared) of the former.

With regard to Models 4 (male sample) and 5 (female sample) shown in Table 1.1. The beta coefficients are interpreted as they would be in an ordinary linear regression; as the change in the value of the response (GHQ-12) that a one unit increase in the particular explanatory variable elicits. These explanatory measures are discussed in greater detail in the preceding chapters and do not at this time require an in-depth discussion. There is much similarity between men and women in terms of the effect that the selected covariates have on GHQ-12 scores. Age, marital status and economic activity are all important predictors of mental well-being although educational attainment, including the interaction effect between age and education seem not to be significant predictors of GHQ-12 scores. Looking more closely at the regression coefficients however, it is clear that for females, being married is more favourable (for mental health) than any other marital status arrangement, while this does not appear to be the case for males, where only being separated or widowed elicits a positive and significant effect on the response. With regards to labour-market status categories; being employed serves as the reference category and it is clear that being in any labour-market category other than 'employed' is detrimental for mental health, which is true for both men and women.

Turning attention to the random-effects parameters; the group-level variation (the deviation of group means around the sample mean, after controlling for explanatory measures) is slightly lower for males (var(_cons) = 9.45) than for females (var(_cons) = 11.61). The residual error, which corresponds to the within-subject variation (longitudinally) for men is reported as being var(Residual) = 14.98 and for the female sample var(Residual) = 20.18. Using these estimates of the variance between group means around the constant (between-groups) and the variance within units around their (individual) group mean, a measure of the amount of variation in the response that is present at the level-2 and level-1 of the data are obtained. Focussing on the random-effects parameters, the inclusion of the level-1

covariates have helped to explain some of the variation in the response at the group-level, since the ICC estimates are slightly lower in Models 4 and 5 (Table 1.1), than they were in the null variance components models (Model 2 and Model 3 in Table 1).

With regards to the male sample (Model 4), the ICC is .39, which means that approximately 39 percent of variation in the response, net of the effects of the covariates, is explained at the group-level (between individuals), which leaves approximately 61 percent of the variation in GHQ-12 scores is due to within-unit differences (i.e. within the same person over time). The inclusion of the explanatory measures have only explained 3 percent of the variation in the response at the higher level (since the ICC statistic in the null model for males (Model 2) was .42 (42 percent in other words). With regards to the female sample in Table 1.1 (Model 5), ICC = .37, and so 37 percent of the variation in the response is explained at the group level (between individuals), with 63 percent of the variation in the response explained at the lower (within-units) level. The ICC statistic in the null model for females Table 4.1 (Model 3) was .40, therefore, just like the male sample, 3 percent of variation at the group level has been explained (reducing the ICC statistic) by including the covariates in the model. The likelihood ratio test (LR test) confirms that variation in the response between groups is indeed not equal to zero, and thus we reject the null hypothesis.

Table 1.1 Random intercept models

Fixed-effects parameters	Model 4	(Males)		Model 5	(Females)	
GHQ-12 (Likert)	b	(se)	[95% CI]	b	(se)	[95% CI]
Age	0.26***	(0.01)	[0.23,0.29]	0.17***	(0.02)	[0.14,0.20]
Age Squared	-0.00***	(0.00)	[-0.00,-0.00]	-0.00***	(0.00)	[-0.00,-0.00]
Married ♀	0.00			0.00		
Couple	-0.10	(0.07)	[-0.23,0.04]	0.17*	(0.07)	[0.03,0.32]
Widowed	1.35***	(0.26)	[0.84,1.86]	1.85***	(0.16)	[1.54,2.16]
Divorced/Sep	0.89***	(0.10)	[0.70,1.08]	1.02***	(0.09)	[0.85,1.19]
Never Married	0.13	(0.08)	[-0.02,0.29]	0.22*	(0.09)	[0.05,0.39]
Degree/Post Grad'	0.34	(0.27)	[-0.19,0.88]	-0.55	(0.29)	[-1.12,0.03]
Diploma/Voc'	-0.08	(0.20)	[-0.47,0.31]	-0.32	(0.22)	[-0.75,0.11]
High School Quals ♀	0.00			0.00		
Low/No Quals	-0.09	(0.27)	[-0.63,0.45]	0.58	(0.30)	[-0.02,1.17]
Employed ♀	0.00			0.00		
Unemployed	2.28***	(0.08)	[2.12,2.43]	1.84***	(0.10)	[1.65,2.04]
Retired	0.41***	(0.11)	[0.20,0.63]	0.25**	(0.10)	[0.06,0.45]
Family Care	1.12***	(0.20)	[0.73,1.51]	0.77***	(0.06)	[0.66,0.89]
Long-term sick / Disabled	4.32***	(0.10)	[4.12,4.52]	4.08***	(0.11)	[3.87,4.29]
H/hold monthly income (Log)	-0.10***	(0.03)	[-0.16,-0.05]	-0.14***	(0.03)	[-0.20,-0.08]
Interaction effects between educ#age						
Degree/Post Grad'	-0.01	(0.01)	[-0.02,0.01]	0.01	(0.01)	[-0.01,0.02]
Diploma/Voc'	0.00	(0.00)	[-0.01,0.01]	0.00	(0.01)	[-0.01,0.02]
High School Quals ♀	0.00			0.00		
Low/No Quals	-0.00	(0.01)	[-0.01,0.01]	-0.01	(0.01)	[-0.02,0.01]
_constant	5.69***	(0.36)	[5.00,6.39]	9.09***	(0.38)	[8.35,9.83]
N	73,481			85,951		
N_g	11160			12225		
bic	423475.40			519671.49		
ll	-211625.65			-259722.13		
Random-effects	**Estimate(Std.Err)**		**[95% CI]**	**Estimate(Std.Err)**		**[95% CI]**
pid: Identity						
sd group-level variation	3.07	(0.03)	[3.02,3.13]	3.41	(0.03)	[3.35,3.45]
var(_cons)	9.45	(0.18)	[9.11,9.81]	11.61	(0.21)	[11.2,12.02]
sd within subject variation	3.87	(0.01)	[3.85,3.89]	4.40	(0.01)	[4.47,4.52]
var(Residual)	14.98	(0.08)	[14.81,15.14]	20.18	(0.10)	[19.98,20.39]
Rho / ICC	.39	(0.004)	[0.38,0.40]	.37	(0.004)	[0.36,0.38]
LR test:	= 18412.60 Prob >= chibar2 = 0.0			= 20297.36 Prob >= chibar2 = 0.00		

Legend: p<0.05 * p<0.01** p<0.001 ***

♀ = Reference Category

Source: BHPS 1991-2008

3.4.4 Random intercepts and random slopes model

Having estimated the null variance components models (Table 1.), then including covariates and allowing intercepts to vary across groups (Table 1.1), a random intercept and random slope model is next estimated and the results presented in Table 1.2. As the name suggests, a random intercept and random slopes model allows both intercepts and slopes (regression coefficients) to vary across groups. This is often the next logical step for fitting multilevel models with data that is hierarchically structured (Snijders and Bosker, 2012). As was observed in the random intercept model, although each group has a separate intercept the slopes are constrained to have the same slope as the overall regression line, which means that the effect of the explanatory variable on the response is the same across groups. However, depending upon the subject matter and population of interest, such an assumption may not hold true. That is to say that it cannot be assumed that age, occupation, level of job satisfaction, marital status or any other explanatory variable for that matter, has the same effect on the response (mental well-being) across all groups (individuals in this case). For some, the effect that the explanatory variable has on their mental well-being might be small, while for others the effect might be larger. The random intercept model allows for such questions to be explored and better understand the relationship between mental health and a selection of explanatory variables within and across groups and over time.

In the random slopes model each group is allowed to have its own slope and in doing so allows the effect of the explanatory variable on the response to be different for each group (individual in this case). This is achieved by adding a random term to the coefficient of the explanatory variable and allowing the response to be different for each group. The regression slopes are therefore not constrained to follow the same slope as the overall regression line, but instead have a steeper or shallower slope depending upon the within-unit observations and better fit the data. There two sources of variation in the random intercept and random slope model; for the random intercept (as previously described) an estimate for the difference between the intercept for the overall regression line and the intercept for the group line is obtained; for the random slope an estimate for the difference between the slope for the overall regression line and the slope for the group line is

obtained. More succinctly, the random intercept represents the deviation of cluster-specific intercept from mean intercept, and the random slope provides an estimate of the deviation of cluster-specific slope from the mean slope (Rabe-Hesketh and Skrondal, 2012: 48). In other words, it should not be assumed that the two random-effects are independent.

Table 1.2 presents the results of a random intercept and random slope for both males (Model 6) and females (Model 7) are shown. In these examples, the coefficient for age is allowed to vary between subjects (hence the random slope).

Table 1.2 Random intercept and random slope models:

Fixed-effects parameters	**Model 6**	**(Males)**		**Model 7**	**(Females)**	
GHQ-12 (Likert)	b	(se)	[95% CI]	b	(se)	[95% CI]
Age	0.25***	(0.01)	[0.23,0.28]	0.16***	(0.02)	[0.13,0.19]
Age Squared	-0.00***	(0.00)	[-0.00,-0.00]	-0.00***	(0.00)	[-0.00,-0.00]
Married ♀	0.00			0.00		
Couple	-0.08	(0.07)	[-0.21,0.05]	0.18*	(0.07)	[0.04,0.33]
Widowed	1.53***	(0.28)	[0.99,2.08]	1.99***	(0.17)	[1.66,2.33]
Divorced/Sep	0.96***	(0.10)	[0.76,1.15]	1.06***	(0.09)	[0.89,1.23]
Never Married	0.16*	(0.08)	[0.01,0.32]	0.22*	(0.09)	[0.04,0.39]
Degree/Post Grad'	0.30	(0.29)	[-0.27,0.87]	-0.52	(0.31)	[-1.14,0.09]
Diploma/Voc'	-0.03	(0.21)	[-0.44,0.38]	-0.37	(0.23)	[-0.83,0.08]
High School Quals ♀	0.00			0.00		
Low/No Quals	0.03	(0.29)	[-0.54,0.60]	0.79*	(0.32)	[0.15,1.42]
Employed ♀	0.00			0.00		
Unemployed	2.30***	(0.08)	[2.15,2.45]	1.82***	(0.10)	[1.62,2.02]
Retired	0.46***	(0.12)	[0.23,0.69]	0.27**	(0.10)	[0.07,0.47]
Family Care	1.16***	(0.20)	[0.77,1.56]	0.79***	(0.06)	[0.68,0.91]
Long-term sick / Disabled	4.29***	(0.10)	[4.09,4.50]	3.99***	(0.11)	[3.78,4.21]
H/hold monthly income (Log)	-0.11***	(0.03)	[-0.17,-0.05]	-0.16***	(0.03)	[-0.22,-0.10]
Interaction effects between educ#age						
Degree/Post Grad'	-0.00	(0.01)	[-0.02,0.01]	0.01	(0.01)	[-0.01,0.02]
Diploma/Voc'	0.00	(0.01)	[-0.01,0.01]	0.01	(0.01)	[-0.01,0.02]
High School Quals ♀	0.00			0.00		
Low/No Quals	-0.00	(0.01)	[-0.02,0.01]	-0.01	(0.01)	[-0.02,0.00]
_constant	5.76***	(0.37)	[5.03,6.49]	9.32***	(0.40)	[8.54,10.09]
N	73481			85951		
N_g	11160			12225		
bic	423096.30			519300.63		
ll	-211424.90			-259525.34		
Random-effects	**Estimate(Std.Err)**		**[95% CI]**	**Estimate(Std.Err)**		**[95% CI]**
pid: Unstructured						
sd(_age) std.dev around RS .11	(0.04)		[0.11,0.12]	.12	(0.004)	[0.12,0.13]
sd(_cons) std.dev around RI 4.9	(0.14)		[4.65,5.19]	5.42	(0.15)	[5.14,5.72]
corr(age,_cons) Corr. between intercepts and slopes	-.82	(0.01)	[-0.84,-0.80]	-.82	(0.01)	[-0.83,-0.79
sd(Residual) within subject residual std.dev	3.82	(0.01)	[3.80,3.84]	4.44	(0.01)	[4.42,4.46]

LR test vs. linear regression:

[chi2(3) = 18814.10 Prob > chi2 = 0.00] [chi2(3) = 20690.94 Prob > chi2 = 0.00]

Legend: p<0.05 * p<0.01** p<0.001 ***
♀ = Reference Category
RI = Random Intercept RS = Random slope
Source: BHPS 1991-2008

There is now more information shown under the random effects parameters at the foot of Table 1.3. The estimate of the random intercept standard deviation (sd(_cons)) is 4.9 for males and 5.4 for females, while the random slope standard deviation (sd_age)) is .11 and . 12 for males and females respectively. The correlation between the intercepts and the slopes (corr(age,_cons)) is -.82 for both males and females. A negative correlation means that for individuals who have a high GHQ-12 score, their slopes are shallower or in other words, age has less effect on the response (GHQ-12), conversely, for groups (individuals) who have the lowest GHQ-12 scores, over time (age in years in this instance), their slopes are steeper, suggesting that age has a stronger effect on our response. Graphically speaking, the group lines (individual slopes) would appear to be 'fanning in', where those with high GHQ-12 scores have flatter slopes as age increases, and those with lower GHQ-12 scores have steeper slopes as age increases. The within-subject residual standard deviation (around subject specific regression lines) is shown at the bottom of Table 1.3, this is 3.82 for males and 4.44 for females.

3.4.5 Centering explanatory variables

When adding covariates to multilevel models it is important to consider the implications that different strategies for centring (or scaling) the explanatory measures have in relation to the interpretation of the intercept and slope parameters (Enders and Tofighi, 2007). Broadly speaking, there are three main (or at least popular) options for centring predictors in multilevel modelling; no centering; grand mean centering; and group (or cluster) mean centering (Nezlek, 2001: 775). Not centring the predictor variable means that the intercept represents the expected value of the response for an individual who has a zero value on all explanatory variables. If predictors are centred around their grand-mean, then the intercept represents the expected value of the response for an observation within a group when they are at that overall (explanatory variable) mean. If predictors are centred around their group mean, then the intercept is interpreted as the expected outcome for the response for a unit

within a group whose value on the explanatory variable is equal to the group mean (all units who are in the same group and not the entire sample in other words) (Paccagnella, 2006: 70). However, as this is panel data, where (repeated) observations are nested within individuals, group-mean centering certain explanatory variables, such as age or educational attainment for example, makes less sense (akin to asking someone who old they are on average). If the explanatory variable include a meaningful zero point then it may be sensible not to rescale or centre. However, if a measure does not include a meaningful zero, such as age or any other measure where zero is not meaningful or intelligible, then grand-mean centering is an option (Nezlek, 2001).

By way of illustration and also to explore questions that are addressed more thoroughly in this thesis, the models reported in Table 1.2 (random intercept and slopes models 6 and 7) are re-estimated. This time, age is centred around its mean that the results in random-effects part of the model's are compared. Table 1.3 compares the male sample (model 6 with newly estimated model 8) and Table 1.4 shows the same comparison for the female sample. Only the constant (intercept) from the fixed part of the model is reported as the substantive results concerning the effect that the socio-demographic and socio-economic covariates have on the response does not change significantly.

Table 1.3 Not centering age and centering age in male sample

Male Sample	**No Centering (Age)**			**Grand Mean Centering (Age)**		
	Model 6			**Model 8**		
Fixed-effects	***Estimate(Std.Err)[95% CI]***			***Estimate(Std.Err)[95% CI]***		
Constant(_cons)	5.76	(0.37)	[5.03,6.49]	11.1	(0.22)	[10.6,11.5]
Random-effects						
pid: Unstructured						
srd.dev around RS	.11	(0.04)	[0.11,0.12]	.12	(0.04)	[0.11,0.13]
std.dev around RI	4.9	(0.14)	[4.65,5.19]	2.8	(0.03)	[2.80,2.92]
Corr between RI and RS	.82	(0.01)	[-0.84,-0.80]	.20	(0.02)	[0.15,0.24}
Within subject resid.	3.82	(0.01)	[3.80,3.84]	4.44	(0.01)	[4.42,4.46]

Key: RS = Random slope RI = Random intercept
Source: BHPS 1991-2008

With regards to the male sample (Table 1.3), when age is centred around its grand mean, the value of the intercept increases from 5.76 (Model 6) to 11.1 (Model 8). As previously described, the value of the intercept when age was not centered, represented the value of the response when the explanatory variables were equal to zero, which in the context of

age, makes little sense. Whereas when age is centered around its sample mean, we interpret the intercept in the fixed part of the model, as being the value of the response when the explanatory measure is equal to its grand (or sample) mean-value (in this case mean age, which is 40 years old for both men and women). Therefore, we can say with regards to Model 8, that for males aged 40 years old (and controlling for all other covariates) their GHQ-12 score is around 11 (with a standard error of .22). Considering now the random-parameter estimates in Table 1.3, when we centre age around the grand-mean, the estimated standard deviation around the random intercept (sd(_cons)) is lowered, from 4.9 in the non-centered model to 2.8, when age is mean-centered. There is no such change in the estimated random slope standard deviation (sd(c_age)) (.11 when not centered and .12 when centered around the grand mean). As the intercept value changes as a result of the centering strategy, so too does the associated correlation between the random intercept and slopes (corr(c_age,cons)).

The variance in slopes between groups (sd(c_age) and variance in intercepts between groups (sd(_cons) is interpreted together to estimate the covariance between the intercepts and slopes (corr(c_age,cons)). This has changed from being negatively correlated (-.82) in Model 6, to being positively correlated (.20) in Model 8. In other words, the slopes are 'fanning-out', where they were previously 'fanning-in'; this indicates the importance of where we position our X-value, (from previously X=0 to X=40 (its mean). As a result, for individuals (groups) with higher intercepts, they also have steeper (more positive) slopes, and individuals (groups) with lower intercepts have flatter slopes. This is in contrast to the negative correlation between intercepts and slopes reported in Model 8, meaning that lower intercepts were associated with more positive slopes, and higher intercepts with flatter slopes. These somewhat contradictory results reflect the quadratic nature of the relationship between mental well-being and age which is explored further in the next chapter.

With regards to the female sample (Table 1.4), where Model 7, the results from the previously estimated (non-centered) model, are compared with Model 9 where age is centered around is grand-mean (or the sample mean, which is 40 years old). In the fixed part of the model, the intercept has increased from 9.32 to 12.5 in Model 9. Thus holding

all other covariates at zero, a typical 40 year old female in the sample has a GHQ-12 score of 12.5 (with standard error of .25). It is interesting to note that where the male samples intercept increased by approximately 5 points, for females this increase was only 3 points. Moreover, the suggested cut-off, or threshold applied to the GHQ-12 Likert scale is between 11 or 12 (Goldberg et al. 1998) (the latter is applied in this research). This means that for the 'average-aged' female in this sample (who are 40 years old), and controlling for the previously included explanatory measures, the value of the response (at 12.2) is actually beyond the threshold whereby psychiatric morbidity is (potentially) present.

Table 1.4 Not centering age and centering age in female sample

Female Sample	**No Centering (Age) Model 7**			**Grand Mean Centering (Age) Model 9**		
Fixed-effects	***Estimate(Std.Err) [95% CI]***			***Estimate(Std.Err) [95% CI]***		
Constant(_cons)	9.32	(0.40)	[8.54,10.09]	12.5	(0.25)	[12,13]
Random-effects						
pid: Unstructured						
Std.dev around RS	.12	(0.004)	[0.12,0.13]	.13	(0.004)	[0.12,0.13
Std.dev around RI	5.42	(0.15)	[5.14,5.72]	3.18	(0.03)	[3.12,3.25]
Corr between RI & RS	-.82	(0.01)	[-0.83,-0.79]	.17	(0.02)	[0.12,0.21]
Within subject resid.std.dev	4.44	(0.01)	[4.42,4.46]	4.44	(0.01)	[4.42,4.47]

Key RS= Random slope RI = Random intercept
Source: BHPS 1991-2008

The random-effects parameters; the variance in slopes between groups (individuals) has remained almost identical (.12 and .13 in the non-centered and centered models respectively). However, the variance in the intercepts between groups when age equals zero (5.42 in Model 7), has decreased to 3.18 when age=40 and all other covariates are equal to zero (Model 9). The correlation between the intercept and the slopes was previously negative (-.82 in Model 7), it is now positive (.17) when age is centered around its sample mean (Model 9). This is comparable to the male sample and suggests that for females with higher intercepts (higher GHQ-12 scores and therefore 'poorer' mental well-being), they also have steeper slopes, indicating a worsening of mental well-being with every unit increase in age (from its average). Moreover, for females with lower intercepts (better mental well-being), their slopes are flatter.

Chapter 4 - Sociodemographic and Socioeconomic Patterns in the Distribution of Mental Health

4. Introduction

This chapter will identify and explore a range of socio-demographic and socio-economic determinants of mental health and well-being. More precisely, I will consider the distribution of mental well-being in relation to age; marital status; educational attainment; subjective health status; household monthly income; and economic activity. Separate analysis will be conducted for men and women to explore the impact that gender has on the relationships between mental well-being and socio-demographic and socio-economic characteristics. The descriptive statistics presented and preliminary analysis conducted in this chapter will help provide the reader with a profile of mental health in the United Kingdom and highlight socio-demographic and socio-economic patterns in its distribution.

4.1 Aims and research questions to be addressed

1. Explore the pattern and variation of mental health and well-being across socio-demographic and socio-economic indicators
2. How much variation in mental health and well-being is explained by including and excluding subjective health status?

4.1.1 Dataset and selected variables

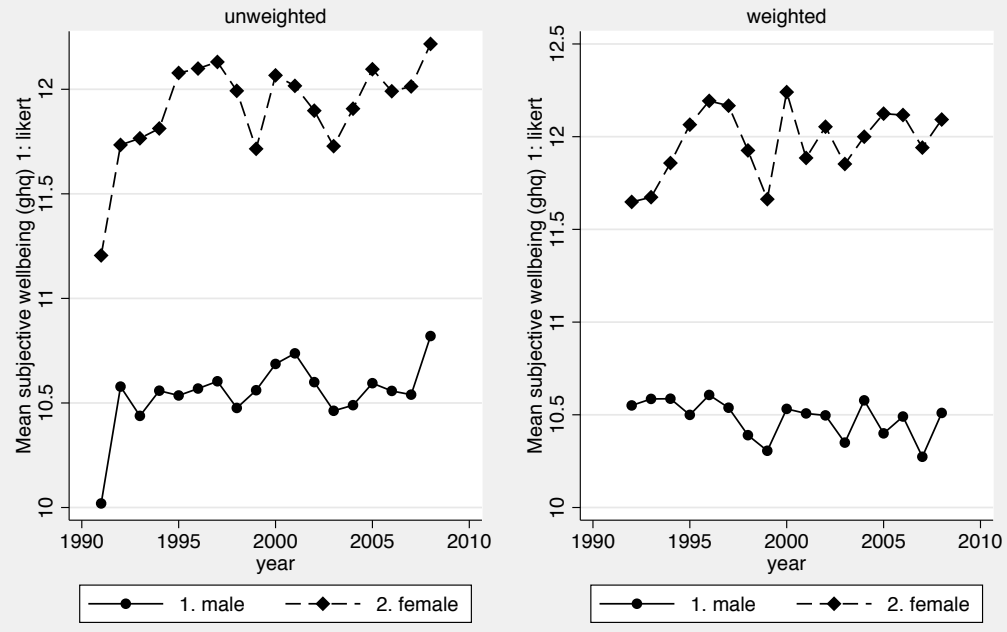
In order to answer these questions, waves 1 to 18 (1991-2008) have been used from the British Household Panel Survey (BHPS) (University of Essex, 2010). The BHPS is a nationally representative sample, and is comprised more than 10,000 individuals nested within approximately 5,500 households in wave 1 (1991). In wave 9 (1999) a booster sample of 1,500 households were added from Scotland and Wales, and 2,000 households from Northern Ireland were included in wave 11 (2001). Presently, the BHPS includes more than 22,000 individual members nested within approximately 9,000 households and as such, represents a rich micro-dataset that provides a nationally representative sample of

UK households. Original sample members (OSM) are interviewed alongside anyone else (over 16 years of age) who lives in the household at that time. Each year these original sample members are reinterviewed where possible and if they leave their household to form another they are followed and all people in the new household who are 16 years old interviewed. The BHPS covers a range of topics and collects information on issues including employment; accommodation; tenancy; housing conditions; residential mobility; education; socio-economic values; marital and relationship history; labour market behaviour; social support; health; and of course mental health. The main advantage of any panel dataset, not least the BHPS, is that records for individuals present in more than one wave can be linked, and thus permits researchers to explore more complex processes and transitions over time (Lambert, 2006).

4.2 Summary statistics: mental well-being by gender and year

Figure 1. shows mean GHQ-12 scores for each wave of the survey where men and women are considered separately. I have shown both unweighted (left-hand side graph) and weighted (right-hand side graph) mean GHQ-12 scores to illustrate the effect that the sample composition can have on variation in mental health across the panel. It is

Figure 1. Mean GHQ by gender and year



source: BHPS 1991-2008

immediately clear that females have higher mean GHQ-12 scores than males, indicating that females tend to report poorer levels of mental well-being than their male counterparts. This is a common finding which is replicated in many studies (Klose and Jacobi, 2004; Rosenfield and Mouzon, 2013). In addition to there being variation in GHQ-12 scores between men and women, there is also a fairly large amount of variation in mean GHQ-12 scores within gender over time. This appears to be more pronounced for females than it does for males. However, it is important to keep in mind the composition of the data, especially where booster samples for Scotland, Wales and Northern Ireland are included in specific years which will affect the overall GHQ-12 mean scores across the panel.

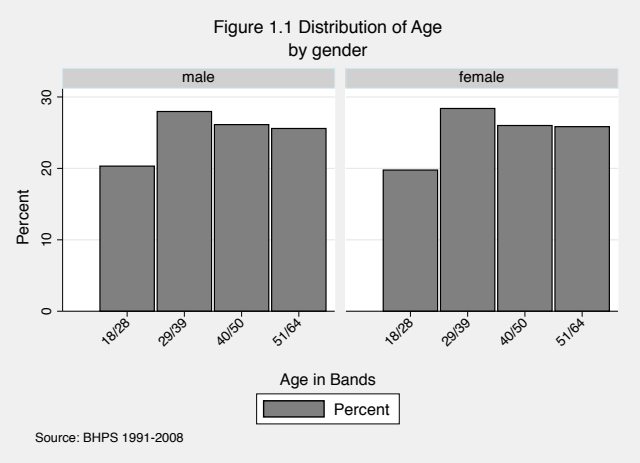
4.2.1 Age in categories

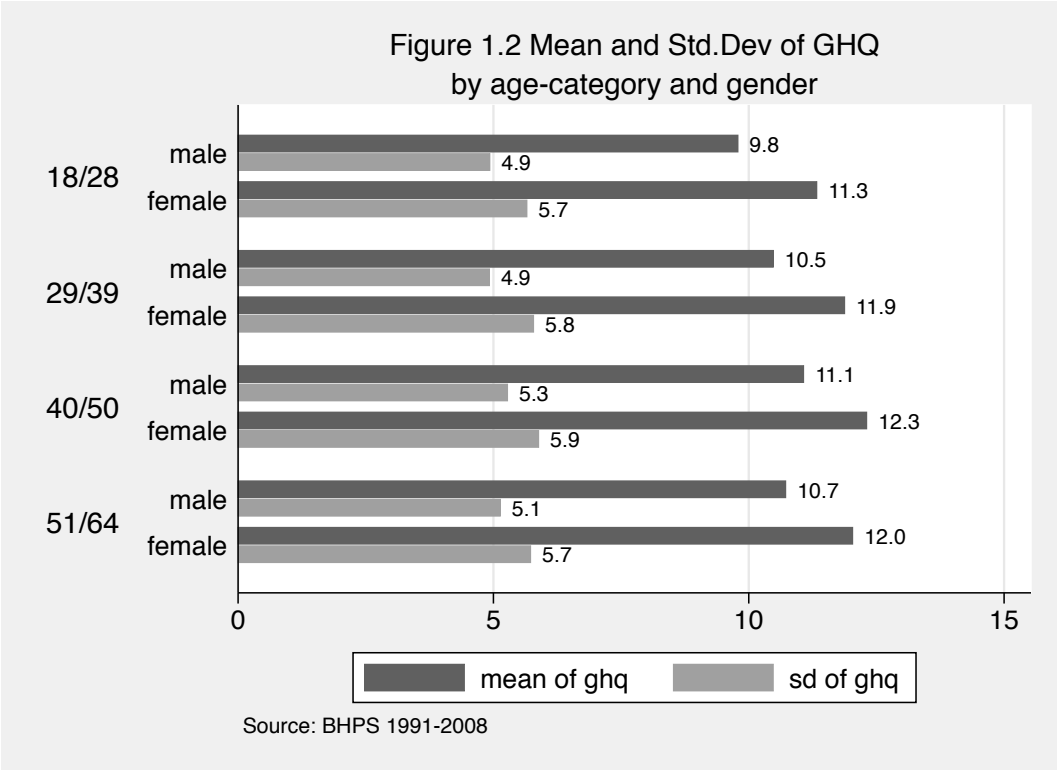
As Table 2. indicates, age has been restricted to included only individuals who are aged 18 years old to 65 years old. Approximately one-quarter of respondents are present in each of the age-categories, with slightly fewer younger (18-28) year olds in the sample for both men and women. The average for both men and women in the sample is 40 years old. When mean GHQ-12 scores across each of the age-categories, as reported in Figure 1.2, is considered, the well-established 'n' shaped pattern (or inverted U shaped cure) between age and mental well-being is confirmed (Blanchflower and Oswald, 2008). This pattern indicates that as individuals get older, their mental well-being deteriorates, reaching a low (or GHQ-12 score peak) around middle-age (40-55 years old), before improving again as people advance through middle-age. The relationship between age and mental health is complex. From a life-course perspective, one could argue that people who are exposed to adversity in early childhood, are at greater risk from poor mental health outcomes in later life (Blanchflower and Oswald, 2008).

Table 2. Distribution of age (by gender)

Age in bands	Male obs/%	Female obs/%	Total obs%
18/28	13,931	15,866	29,797
	20%	20%	20%
29/39	19,173	22,784	41,957
	28%	28%	28%
40/50	17,914	20,870	38,784
	26%	26%	26%
51/64	17,544	20,742	38,286
	26%	26%	26%
Total	68,562	80,262	148,824
	100.00	100.00	100.00

Pearson chi2(3) = 9.1048 Pr = 0.028
Cramér's V = 0.0078
gamma = 0.0063 ASE = 0.004
Source: BHPS 1991-2008



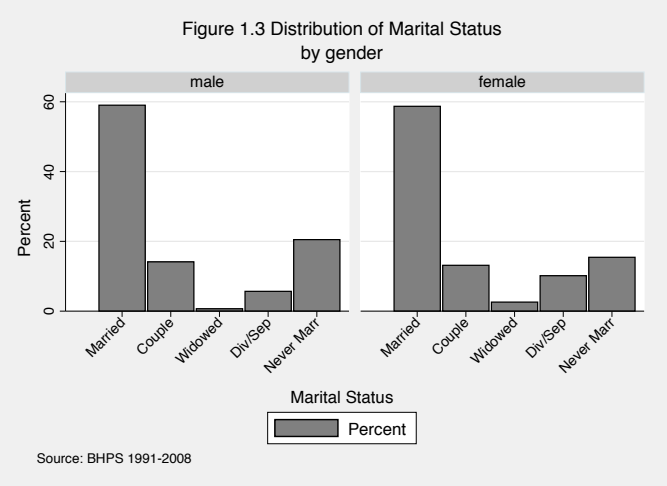


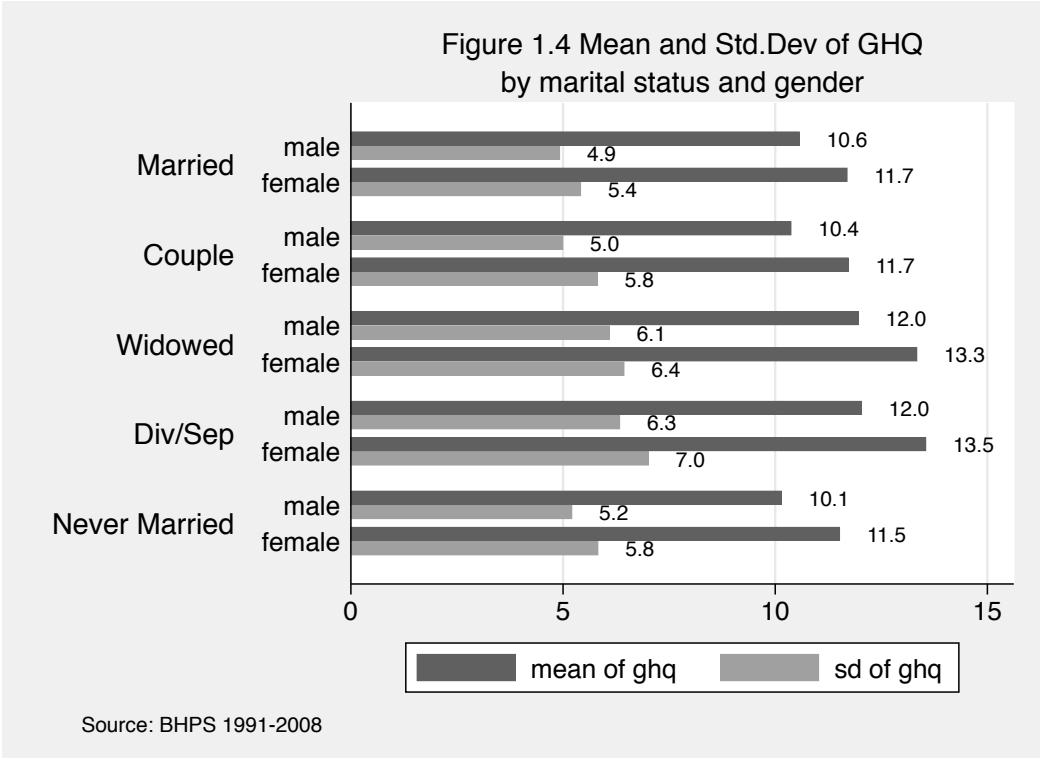
4.2.2 Marital status

Table 2.1 Distribution of marital status by gender

Marital status	Male obs/%	Female obs/%	Total obs%
Married	40,463	47,112	87,575
	59%	59%	59%
Couple	9,683	10,543	20,226
	14%	13%	14%
Widowed	468	2,078	2,546
	1%	3%	2%
Div/Separated	3,892	8,146	12,038
	5%	10%	8%
Never married	14,056	12,383	26,439
	20%	15%	18%
Total	68,562	80,262	148,824
	100%	100%	100%

Pearson chi2(4) = 2.3e+03 Pr = 0.000
Cramér's V = 0.1233
gamma = -0.0157 ASE = 0.004
Source: BHPS 1991-2008





Turning attention to Table 2.1 and Figure 1.3, and the distribution of mental well-being by marital status and gender. 59 percent of both men and women within the sample are married, 1 percent and 3 percent of men and women respectively, are widowed, which is not surprising since age has been restricted to include only individuals who are 65 years of age and younger. Almost the same proportion of males and females report being in a couple, while slightly fewer males are divorced or separated (5 percent difference between

men and women), slightly fewer females report never being married (5 percent difference between men and women). A common finding in studies that consider the relationship between mental well-being and marital status is that married people and couples alike, tend to have better and more positive mental health and well-being when compared to people who have been 'uncoupled'; whether through divorce, separation or being widowed, which is associated with poorer mental health and well-being. There are several reasons why marriage and coupledom are more favourable and conducive for mental health and well-being than is being single or uncoupled. Financial benefits are perhaps the most measurable in terms of having a joint household income, but more than that is companionship and having someone who you can presumably talk to. Being lonely can be detrimental for mental and physical health.

When the mean and standard deviation of GHQ-12 scores are considered across each of the categories (Figure 1.4), these aforementioned views appear to be supported. Both men and women have on average the lowest GHQ-12 score (and therefore the most positive mental well-being) who report not being married. However, of the 18 percent of the sample who report never being married, more than half are aged between 18 years and 28 years old. Therefore the association between not being married and mental well-being is, in this instance perhaps more to do with the age-effect, where younger people tend to have more positive mental well-being than do older people. Men who are in a couple and those who are married have on average (approximately) the same mean GHQ-12 scores. The same is true for females where both categories show the exact same mean GHQ-12 scores (11.7 in each instance). For men, being widowed, and also being divorced or separated report the highest mean GHQ-12 scores of 12 in each instance. For females in these same categories, they too report a mean GHQ-12 score of 13 (widowed) and 13.5 (divorced/separated).

4.2.3 Educational attainment

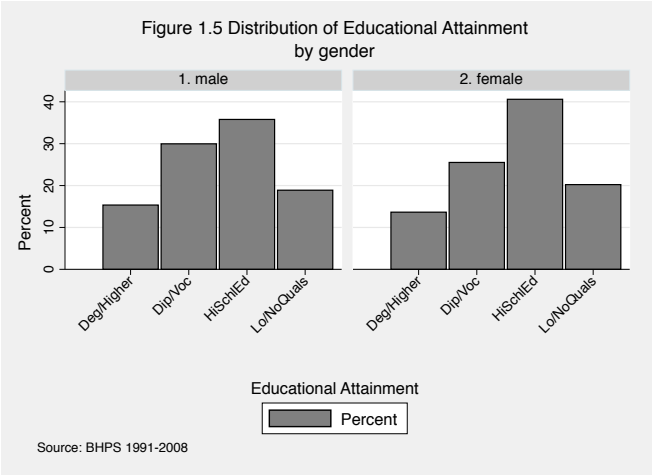
Table 2.2 and Figure 1.5 show the distribution of educational attainment by gender. More than one third of both male and female respondents have at least 'high-school level' qualifications (Higher's or A-Level for example) (36 percent male and 41 percent female). 30 percent of male respondents and 25 percent of female respondents have a 'diploma or

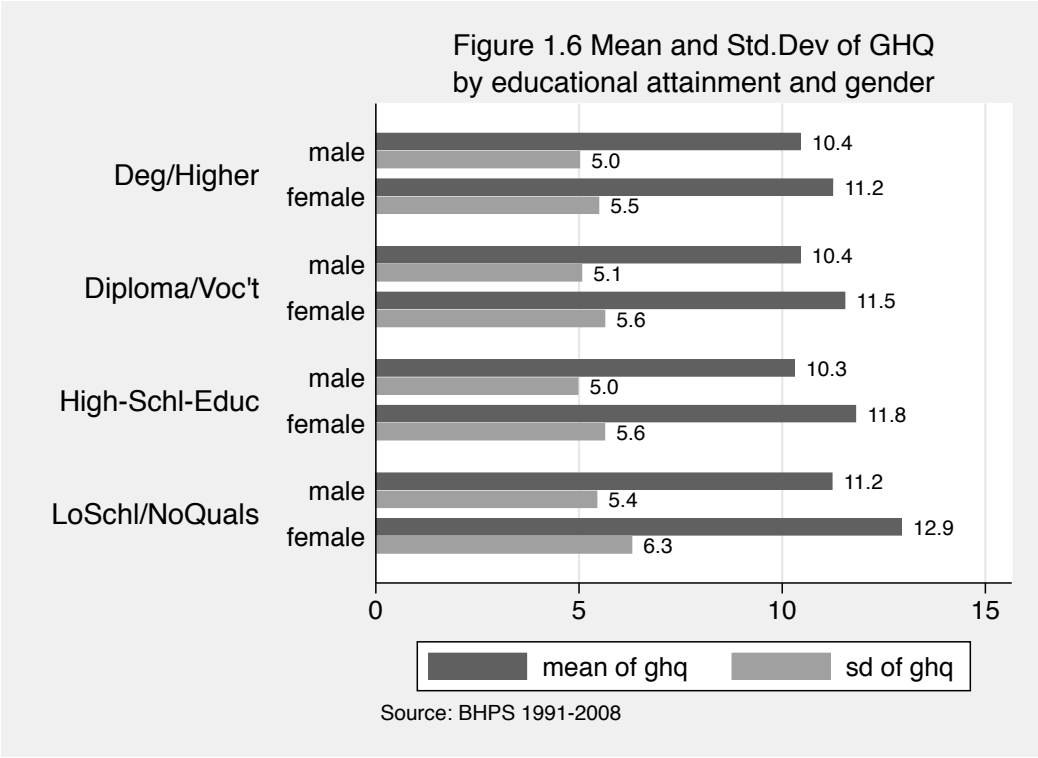
vocational qualification'. Almost the same percentage of men and women (19 percent and 20 percent respectively) have 'low-level qualifications or no qualifications). Of all the educational categories, having a 'degree or post-graduate' qualification has the least percentage of cases for both men (15 percent) and women (15 percent).

Table 2.2 Distribution of educational attainment by gender

Educational attainment	Male obs/%	Female obs/%	Total obs%
Deg/Higher	10,524	10,954	21,478
	15%	14%	14%
Dip/Vocational	20,547	20,482	41,029
	30%	25%	27%
Hi-Schl Educ	24,536	32,588	57,124
	36%	41%	38%
Low/NoQuals	12,955	16,238	29,193
	19%	20%	19%
Total	68,562	80,262	148,824
	100%	100%	100%

Pearson chi2(3) = 596.7718 Pr = 0.000
Cramér's V = 0.0633
gamma = 0.0771 ASE = 0.004
Source: BHPS 1991-2008





In terms of mean GHQ-12 scores across each of the categories (shown in Figure 1.6), having 'low or no qualifications' reports the highest mean GHQ-12 score for both men and women. The average GHQ-12 score across the remaining educational attainment

categories differs by sex, but does not vary much within each sex. However, as these figures only relate to bivariate patterns in the data, it is not possible at this stage to make any claims about the significance of any relationship or association that may or may not exist between educational attainment and mental health and well-being.

Educational attainment is regarded as being a good predictor of socio-economic position and is correlated with other markers of social position and status such as occupation and income for example (RCPSYCH, 2010). Having educational qualifications *can* provide people with more opportunities in terms of the type of job/occupation they can enter and *can* give people more earning power and status for example. However, people with higher levels of educational attainment might also be exposed to more challenging jobs with higher levels of stress for example. This might present something of a paradox where mental well-being is concerned. It is also possible that people are more likely to succeed academically if they have good mental health and well-being to begin with and so we do not necessarily see gains in terms of mental health and well-being as a direct result of their academic achievements.

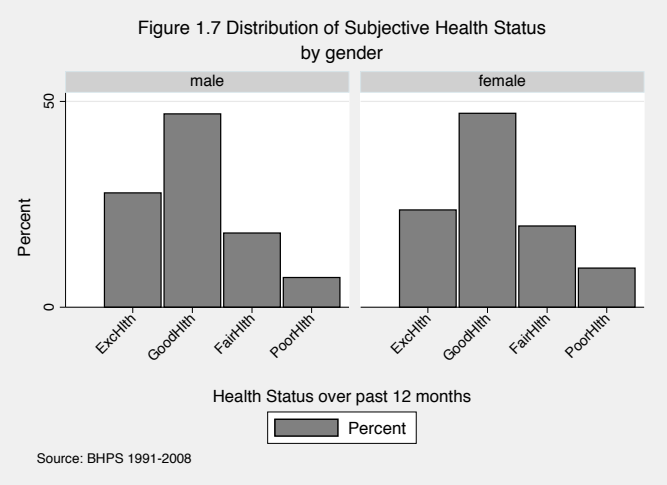
4.2.4 Subjective health status

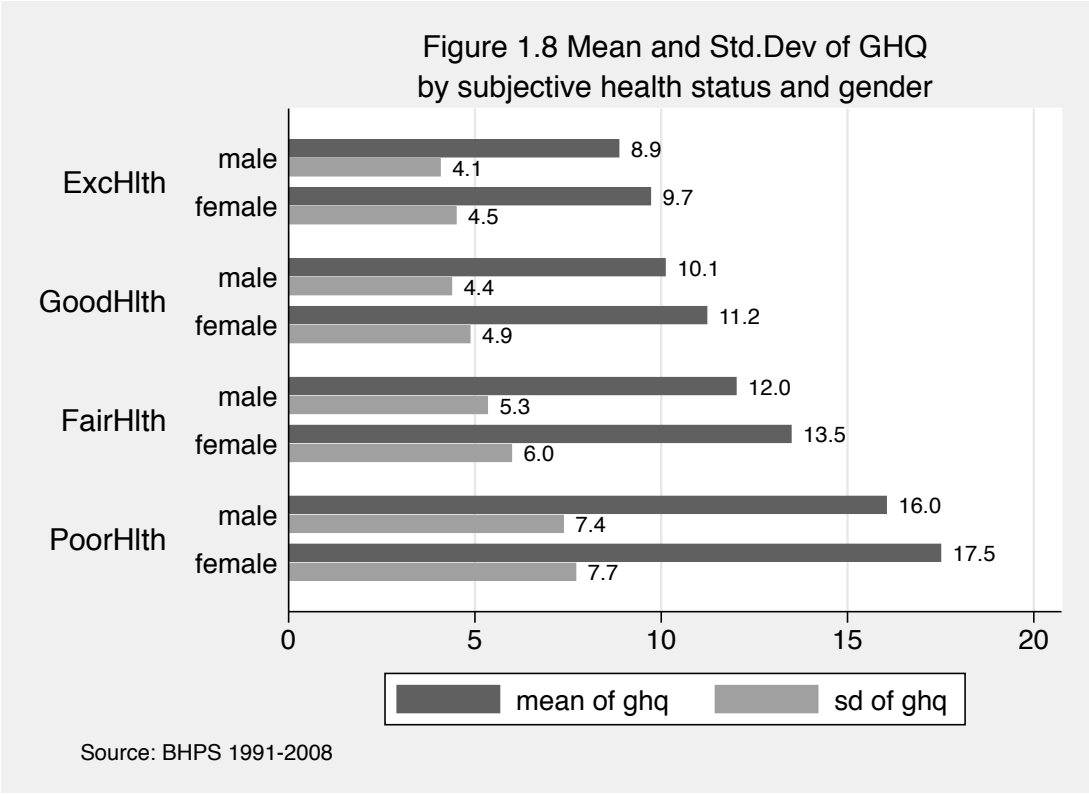
Instead of using an objective measure of ones health, such as questions that ask respondents if they have one or more illnesses, diseases or other 'ailments' from a list, subjective health status allows people to rate their health on their terms to a certain extent. For someone to be unhealthy, they do not need to have an illness or disease. Similarly, because someone has a disease or illness does not necessarily mean that they are unhealthy, either physically and/or mentally. From Table 2.3 and Figure 1.7, it is clear that almost half of both male and female cases report being in 'good health' (both 47 percent). Approximately one quarter (28 percent of men) and (24 percent of women) report having 'excellent health'. This means that approximately one quarter of the sample report having either 'fair' or 'poor' health, where the latter have the fewest number of observations (7 percent of men) and (9 percent of females).

Table 2.3 Distribution of subjective health status over past 12 months, by gender

Subjective health status	Male obs/%	Female obs/%	Total obs%
Exc-Hlth	19,048	18,976	38,024
	28%	24%	26%
Good-Hlth	32,204	37,814	70,018
	47%	47%	47%
FairHlth	12,363	15,843	28,206
	18%	20%	19%
PoorHlth	4,947	7,629	12,576
	7%	9%	8%
Total	68,562	80,262	148,824
	100%	100%	100%

Pearson chi2(3) = 534.4418 Pr = 0.000
Cramér's V = 0.0599
gamma = 0.0935 ASE = 0.004
Source: BHPS 1991-2008





When the mean and standard deviation of GHQ-12 scores are considered (Figure 1.8), a clear pattern emerges. The better a person rates their subjective health, the lower the mean GHQ-12 score. The average GHQ-12 score for men and women who report having 'excellent' health is almost half the average GHQ-12 score for men and women who report having 'poor' health. This is not unsurprising since being asked to rate ones subjective health status is likely to concern both physical and mental health considerations.

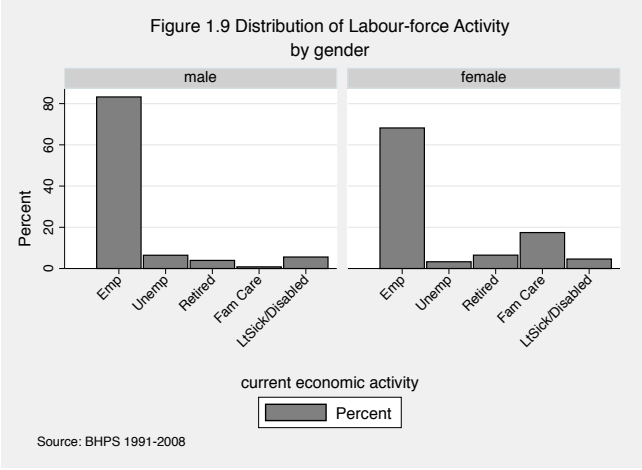
4.2.5 Labour-force activity (employment status)

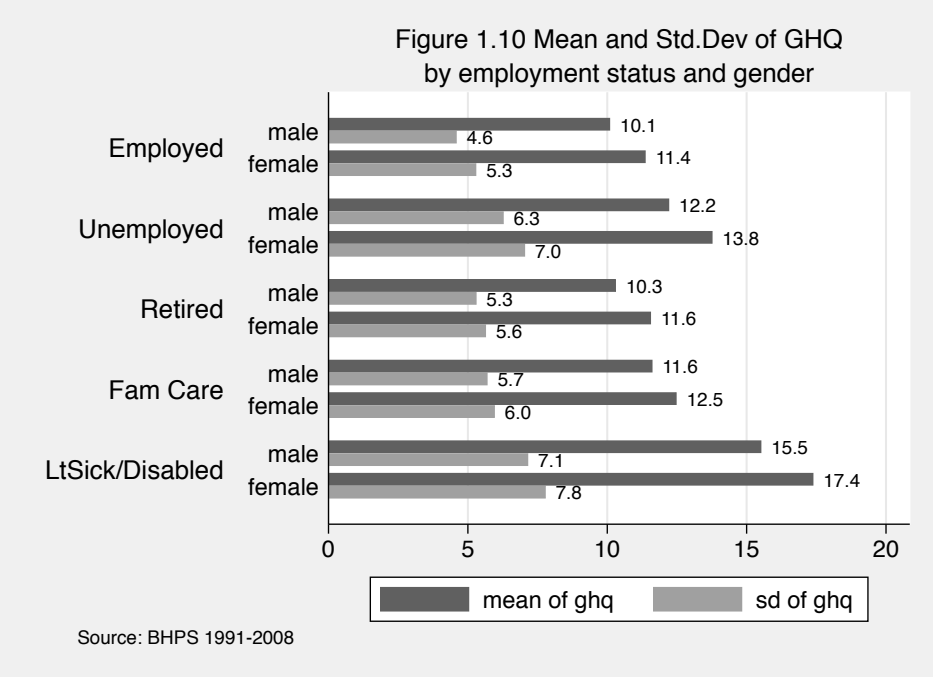
The next explanatory measures that are considered within this chapter relate to one's current economic activity. As indicated in Table 2.4 and Figure 1.9, three quarters of the entire sample are employed, although when this is split according to gender we find that 83 percent of males across the panel are employed, compared to 68 percent of females who are employed. This is explained by the fact that 17 percent of females report being engaged in 'family care roles', while only 1 percent of the males report being in this category. A relatively equal percentage of cases, both male and female, are either 'retired' or 'long-term sick or disabled' (approximately 5 percent in each instance).

Table 2.4 Distribution of labour-force activity by gender

Labour-force activity	Male obs/%	Female obs/%	Total obs%
Employed	57,071	54,731	111,802
	83%	68%	75%
Unemployed	4,415	2,635	7,050
	6%	3%	5%
Retired	2,698	5,208	7,906
	4%	6%	5%
Family Care	554	13,999	14,553
	1%	17%	10%
LtSick/Disabled	3,824	3,689	7,513
	6%	5%	5%
Total	68,562	80,262	148,824
	100%	100%	100%

Pearson chi2(4) = 1.3e+04 Pr = 0.000
Cramér's V = 0.2942
gamma = 0.3791 ASE = 0.005
Source: BHPS 1991-2008





In Figure 1.10 it is clear that people who are long-term sick or disabled have the highest mean GHQ-12 scores of any of the categories. As was discussed in the section above, people who have the poorest subjective health status also report the highest mean GHQ-12 scores, which might also apply when we consider the high mean GHQ-12 scores for people who are registered as 'long-term sick, or disabled'. Their 'sickness' or 'disability' status may even be related to their mental health status; having a specific mental disorder for example. People who report being unemployed have the next highest mean GHQ-12 scores, which is again true for both men and women. This is closely followed by being engaged in 'family-care roles', although only 1 percent of males fall into this category. For those who are employed, they report the lowest mean GHQ-12 scores across any of the categories.

4.2.6 Income and mental health

The final explanatory factor that is included in the analytical models is household monthly income. The summary statistics for household monthly income are shown in Table 2.5 and a histogram of the same information illustrated in Figure 1.11. Men have on average a slightly higher mean income compared to females (£2,760) and (£2,586) respectively. The standard deviation of mean household monthly income is large for both sexes.

Table 2.5 Summary of Household Monthly Income (by gender)

H/hold monthly income(£)	obs	Mean	Std.Dev	Min	Max
Male Sample:	68,562	2,760	1,666	1	9,999
Female Sample	80, 262	2,586	1,642	1	9,999
Total	148,824	2,666	1,656	1	9,999

Source: BHPS 1991-2008

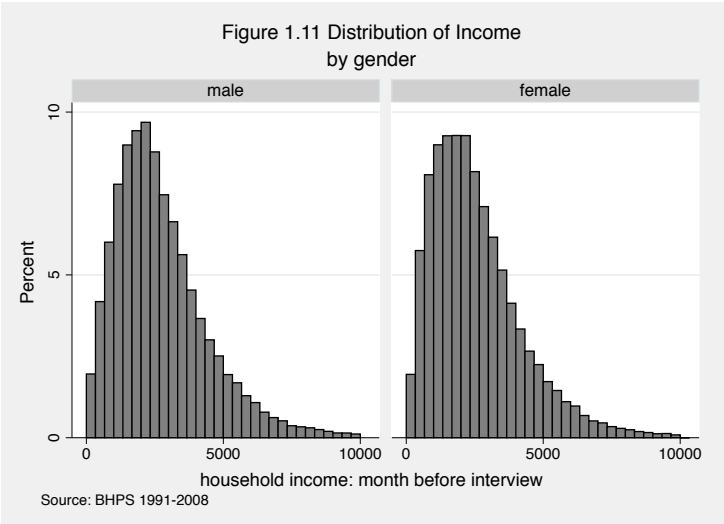


Figure 1.11 Distribution of Income by gender
Source: BHPS 1991-2008

The scatterplot (Figure 1.12) shows the regression line for subjective mental well-being (GHQ-12 Likert scale) by income for men and women. The negative relationship between income and GHQ-12 is evident, suggesting that as income increases, GHQ-12 scores gradually decrease (suggesting better or more positive mental well-being).

Figure 1.12 Subjective well-being and Income (regression-line) by gender

Source: BHPS 1991-2008

4.3 Regression analysis

The results from three separate linear regressions with random effects are presented in Table 2.6. The entire sample is considered in model 1, although gender is controlled for, and models 2 and 3 show the results for men and women respectively. All models are estimated with robust standard errors to account for potential correlation regression disturbances within and between subjects over time and are reported alongside 95 percent confidence intervals (Rabe-Hesketh and Skrondal, 2006). In each instance, reference categories have been selected on the basis that they have the most observations. To ease interpretation, a coefficient plot of all three models are shown in Figure 1.13. Coefficients are plotted and their 95 percent confidence intervals are shown, thus where they cross zero, they are understood not to be significant predictors of mental well-being.

Table 2.6 Linear regression models: Shows effect of socio-demographic and socio-economic characteristics on mental well-being (GHQ-12: Likert scale)

	Model 1	(All)	Model 2	(Male)	Model 3	(Female)
GHQ-12 Likert	b	[95% CI]	b	[95% CI]	b	[95% CI]
Male ♀	0.00				–	
Female	1.11***	[1.02,1.21]	–			
Age 18_28	-0.45***	[-0.56,-0.35]	-0.57***	[-0.71,-0.44]	-0.36***	[-0.51,-0.21]
Age 29_39 ♀	0.00		0.00		0.00	
Age 40_50	0.18***	[0.09,0.27]	0.24***	[0.12,0.37]	0.13*	[0.01,0.26]
Age 51_64	-0.25***	[-0.36,-0.14]	-0.25**	[-0.41,-0.09]	-0.25**	[-0.42,-0.09]
Married ♀	0.00		0.00		0.00	
Couple	-0.09	[-0.20,0.02]	-0.18*	[-0.32,-0.04]	-0.00	[-0.17,0.16]
Widowed	1.48***	[1.13,1.83]	0.97**	[0.27,1.67]	1.61***	[1.21,2.01]
Divorced/Sep	0.83***	[0.66,1.01]	0.74***	[0.47,1.02]	0.91***	[0.68,1.14]
Never Married	-0.09	[-0.22,0.03]	-0.16	[-0.32,0.00]	-0.01	[-0.19,0.17]
Degree/PostGrad'	0.20**	[0.07,0.33]	0.42***	[0.23,0.60]	-0.02	[-0.20,0.17]
Diploma/Voc'	0.01	[-0.09,0.11]	0.11	[-0.03,0.26]	-0.09	[-0.24,0.05]
High School Quals ♀	0.00		0.00		0.00	
Low/No Quals	-0.08	[-0.21,0.06]	-0.16	[-0.34,0.03]	-0.01	[-0.20,0.18]
Excellent Health	-0.96***	[-1.02,-0.90]	-0.80***	[-0.88,-0.72]	-1.09***	[-1.18,-1.01]
Good Health ♀	0.00		0.00		0.00	
Fair Health	1.51***	[1.43,1.59]	1.30***	[1.19,1.41]	1.67***	[1.55,1.78]
Poor/V.PoorHealth	4.44***	[4.28,4.61]	4.08***	[3.82,4.34]	4.67***	[4.46,4.88]
Income (h/h)(log)	-0.11***	[-0.16,-0.07]	-0.08*	[-0.14,-0.01]	-0.13***	[-0.20,-0.06]
Employed ♀	0.00		0.00		0.00	
Unemployed	1.77***	[1.61,1.93]	2.00***	[1.79,2.21]	1.53***	[1.27,1.79]
Retired	-0.38***	[-0.53,-0.22]	-0.41***	[-0.65,-0.17]	-0.38***	[-0.57,-0.18]
Family Care	0.58***	[0.46,0.71]	0.83***	[0.39,1.27]	0.52***	[0.39,0.66]
Long-term sick / Disabled	2.36***	[2.12,2.60]	2.59***	[2.25,2.93]	2.24***	[1.90,2.58]
_cons	10.93***	[10.55,11.31]	10.66***	[10.13,11.19]	12.17***	[11.63,12.72]
N	148824		68562		80262	
N_g	22881		10922		11959	
rho	0.34		0.36		0.33	

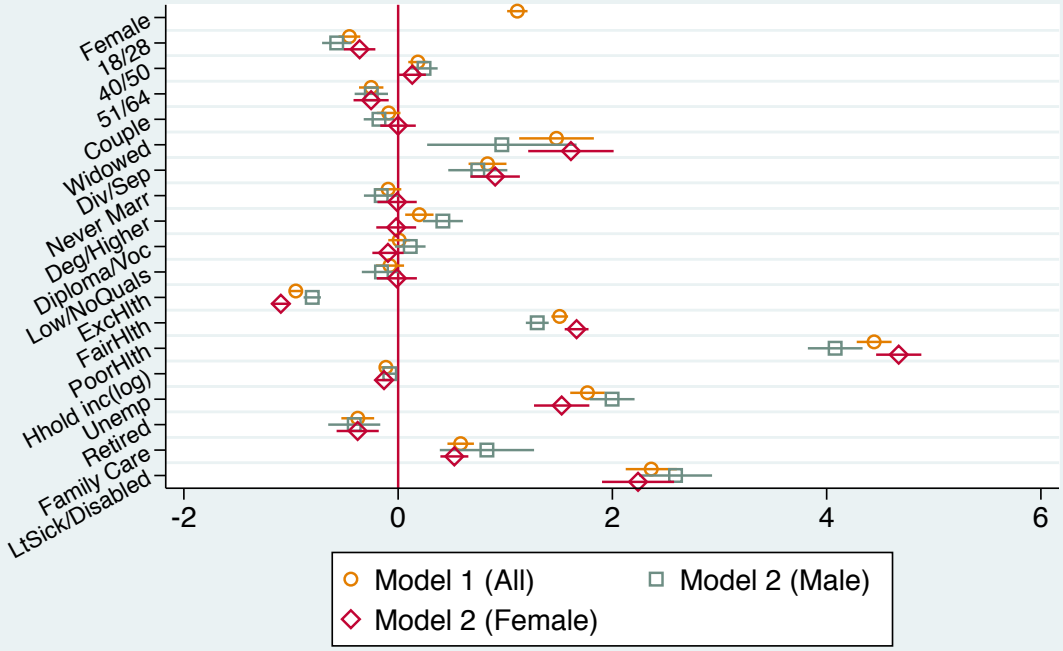
Legend: p<0.05 * p<0.01** p<0.001 ***

♀ = ***Reference Category***
Source: BHPS 1991-2008

As was indicated by the initial summary statistics, females report higher mean GHQ-12 scores than their male counterparts. The results from the first model in Table 2.6 confirms that gender has a positive and statistically significant effect on GHQ-12 scores. The age effect is also apparent; compared to the reference group (age 29 to 39 years old), the youngest age category (18 to 29 years old) shows a negative and significant effect on mental well-being (beta = -.45, p<0.001), as does the oldest age-group category (51 to 64 years of age) (beta = -.25, p<0.001). For those in 'middle-age' (age 40 to 50 years old), they report a positive and significant effect on GHQ-12 scores, indicating on average,

worse mental well-being than the reference group (beta = .18, p<0.001). Comparing the results between the male (model 2) and female (model 3) samples, the same overall effect of age is reported, however, the youngest age-group (18 to 29) has a stronger negative and significant impact on mental well-being for men (beta = -.57, p<0.001) than for women (beta = -.36, p<0.001). An identical negative effect is reported for men and women when the oldest dummy age-group (51 to 64 years old) is concerned (beta = -.25, p<0.01) in each instance.

Figure 1.13 Coefficient Plot of Models 1,2 & 3 compared
Sociodemographic and socioeconomic measures



Source: BHPS 1991-2008

Being married serves as the reference category against which all other marital status categories are compared. As previously mentioned and borne out in the results shown in Table 2.6 is the detrimental effect on mental well-being that being uncoupled through widowhood (beta = 1.48, p<0.001) or divorce/separation (beta = .83, p<0.001) incurs. Looking across the columns and comparing the male (model 2) and female (model 3) samples, being widowed has a stronger positive effect (worse mental well-being) than it does for men who are widowed (beta = .97, p<0.01) and (beta = 1.61, p<0.001) respectively. Similarly, being divorced or separated elicits a slightly stronger positive effect on GHQ-12 scores for females (beta = .91, p<0.001) than it does in males (beta = .74,

p<0.001). The gendered nature of two of the marital status categories must be kept in mind when interpreting the results from the regression and comparing the male and female sample. Less than one percent of the male sample (468 observations) are 'widowed' compared to almost 3 percent of female observations (2,078). The same is true for those who are divorced or separated, where more women than men are present in this category.

A somewhat counterintuitive finding when educational attainment is considered, is that having a 'degree or post-graduate qualification' is, at least for men but not women, associated with a positive and significant effect on the dependent variable (beta = .42, p<0.01). This implies that men with degree-level and above qualifications have poorer mental well-being than men who have 'high-school level' qualifications (the reference category). There are several potential reasons why this might be the case. People with a degree or post-graduate qualification might as a result of their academic achievements have a relatively high-pressured or mentally challenging job than people who do not have such qualifications and subsequent 'graduate' jobs. Alternatively, there may be situations where despite obtaining a degree or post-graduate qualification, some people cannot find suitably challenging, or rewarding work within their desired field. It is also possible that the value in terms of employment opportunities that a degree and post-graduate qualifications afforded has been somewhat diluted, as more and more people go onto university. There might therefore be an interaction effect between age and educational attainment that must be considered and will be explored later in this chapter. Having no qualifications or low-level qualifications appears not to be significant, however, this may have more to do with the choice of reference category.

The significant impact that each of the 'subjective health-status' dummy variables have on mental well-being is clearly visible in the coefficient plot (Figure 1.13). Of all of the explanatory measures included in the regression models, reporting 'poor/very poor health' is associated with the largest positive effect on mental well-being, and is slightly larger for the female sample (beta = 4.67, p<0.001) than for the male sample (beta = 4.08, p<0.001). Keeping in mind that the reference category is people reporting 'good' subjective health, those who report having 'excellent subjective health' elicits the largest negative effect on GHQ-12 scores of any explanatory measure (beta = -.80, p<0.001) for men, (beta = -1.09,

p<0.001) for females. As was previously discussed, the inclusion of subjective health status may be problematic since the evaluation of ones subjective health status will no doubt include ones perceptions about their mental health as well as their physical health.

The relationship between income, variously measured, and mental health and well-being has been studied extensively, although results are often mixed. A common finding however, is that people and households with low levels of income are at greater risk from various mental disorders and have poorer mental well-being more generally (Jenkins et al. 2008). The results from Table 2.6 confirm the link between household income and mental well-being, where a negative relationship is reported, suggesting that as income increases, mental well-being improves (GHQ-12 scores decrease as income increases).

The final set of explanatory measures that are included in the models relate to economic activity. Three quarters of the entire sample are employed, which serves as the reference category. In each instance, approximately five percent of the sample are unemployed, retired, or long-term sick/disabled. Nine precent are engaged in family care, although as noted previously, of this 9 percent, only 1 percent are male. The results estimated in Table 2.6 show that compared to people who are employed, being in 'family-care' is, on average, detrimental for mental well-being and more so for males (beta = .83, p<0.001) and (beta = .52, p<0.001). Compared to being employed, only 'retirement' is associated with a reduction in GHQ-12 scores (indicating an improvement in mental well-being). This is significant in both the male (model 2) and female (model 3) sample (beta = -.41, p<0.001) and (beta = -.38, p<0.001) respectively. As might be expected, being 'long-term sick/ disabled' is associated a large positive effect on mental well-being (beta = 2.59, p<0.001) for men and (beta = 2.24, p<0.001) for females. However, the inclusion of both 'subjective health status' and the category identifying those who are 'long-term sick/disabled' is potentially problematic. For someone who is registered as being 'long-term sick' and thus cannot work, are by definition more likely to report less than optimal 'subjective health status'. Moreover, someones long-term sickness and less than optimal subjective health might actually be the result of psychiatric morbidity. There is a risk therefore of over identification. This is explored in greater detail towards the end of this chapter.

In the last row of the regression models (Table 2.6), the intraclass correlation (*rho)* is reported. The intraclass correlation is a measure of the proportion of variance in the dependent variable that is due to variation within-individuals over time. If most of the variation is between individuals then we can interpret this as meaning that individual's (in terms of their GHQ-12 scores across the panel) change little and *rho* would be large. Conversely, if most of the variation is within-individuals over time, then *rho* will be small (Snijders and Bosker, 1999; Hox, 2002). With regards to the male sample (model 2), the intraclass correlation (*rho)* is .36, while the same statistic in the female only model (model 3) is .33. This means that for men, 36 percent of variation in the dependent variable is due to differences within individuals over time (and thus 64 percent is due to differences between individuals over time). Similarly, 33 percent of variation in the outcome is explained by differences within-individuals over time, and the remaining 67 percent is due to differences between-individuals for females.

4.3.1 Excluding subjective health status

As noted above, the inclusion of subjective health status alongside the economic activity category 'long-term sick/disabled' might lead to over-identification within our model. The impact of leaving out subjective health status for the entire sample (model 4), male sample (model 5) and the female sample (model 6) are reported in Table 2.7. There are some subtle differences in terms of the size of the coefficients from the previous models (Table 2.6) to the ones reported in Table 2.7. In general, there is a slight increase in the size of the coefficients across each of the models, regardless of whether the association between the independent variable and the outcomes is positive or negative. For example, the gender effect in model 4 (All) is now (beta = 1.25, $p<0.001$) compared to (beta = 1.11, $p<0.001$) in model 1 (All) (Table 2.6). The same is true for the effect that different marital status categories have on mean GHQ-12 scores, where a slight increase in coefficients across each of the models is reported. There is not much difference at all in the effect that income (log of household monthly income) has on mental well-being once subjective health status is excluded from the models. Differences in the effect that educational attainment has on mental well-being are more apparent when comparing the previous regression models (1, 2 and 3) with those in Table 2.7 (models 4, 5 and 6).

The counterintuitive finding that was reported in the previous Table 2.6, that having a 'degree/post-graduate' qualification was associated with an increase in GHQ-12 score (on average, detrimental to mental health), no longer holds true once 'subjective health status' is excluded (Table 2.7). Educational attainment is now only significant for females, where having a 'degree/post-graduate' qualification is associated with a negative and significant effect on mental well-being (beta = -.32, p0.01). Moreover, and again only true for females, compared to females who have 'high-school level' qualifications, having 'no or low-level' qualifications is associated with a significant positive (on average detrimental for mental health) affect (beta = .26, $p<0.05$).

The last group of explanatory measures concern the 'economic activity' dummy variables. Compared to people who are employed, being unemployed is still associated with a positive effect on GHQ-12 scores, where the beta coefficients are slightly larger in Table 2.7 results (without subjective status) than in the previous Table 2.6 results (with subjective health status). Similarly, the beta coefficients have increased for both men (model 5) and women (model 6) when 'family care' roles are considered. Once 'subjective health status' is removed from the models, compared to being 'employed', 'retirement' is no longer associated with a reduction in GHQ-12 scores, but is associated with an increase in GHQ-12 scores (detrimental for mental well-being). However, the most notable change in coefficients as a result of removing 'subjective health status' from the model is found for people who report being 'long-term sick or disabled'. The coefficients in Table 2.7 (removing health status) are now significantly higher; from beta = 2.59, to (beta = 4.35, $p<0.001$) for men and from beta = 2.24 to (beta = 4.11, $p<0.001$) for females. This would suggest that the dummy category 'long-term sick/disabled' also captures people who are not only unable to work as a result of their health, but who rate their subjective health status as being less than optimal.

Table 2.7 Linear regression models with random effects and robust standard errors: Shows effect of socio-demographic and socio-economic characteristics on mental well-being - Excluding subjective health status (GHQ-12: Likert scale).

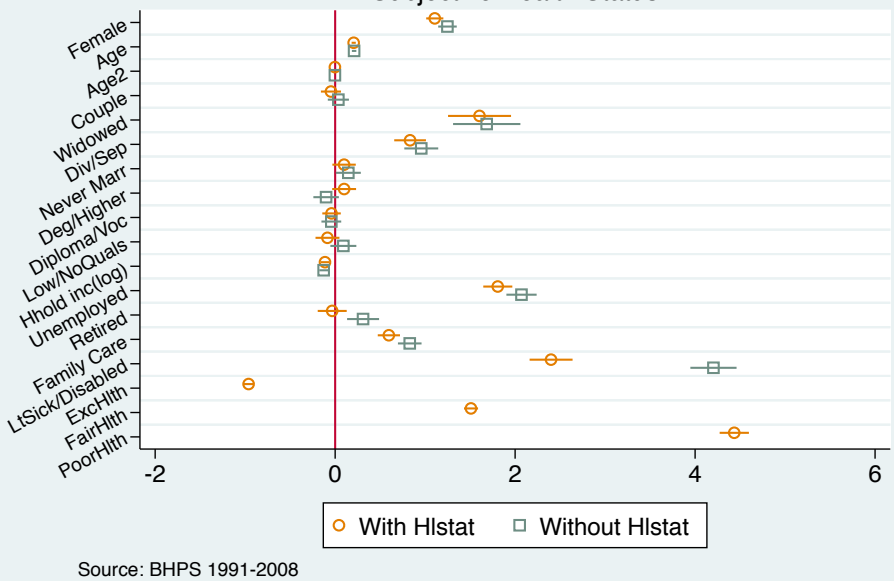
	Model 4	(All)	Model 5	(Male)	Model 6	(Female)
GHQ-12 Likert	b	[95% CI]	b	[95% CI]	b	[95% CI]
Male ♀	0.00				–	
Female	1.25***	[1.15,1.35]	–			
Age	0.21***	[0.19,0.24]	0.26***	[0.22,0.29]	0.17***	[0.14,0.21]
Age Squared	-0.00***	[-0.00,-0.00]	-0.00***	[-0.00,-0.00]	-0.00***	[-0.00,-0.00]
Married ♀	0.00		0.00		0.00	
Couple	0.04	[-0.08,0.15]	-0.07	[-0.22,0.08]	0.14	[-0.04,0.31]
Widowed	1.68***	[1.31,2.06]	1.25***	[0.53,1.97]	1.82***	[1.38,2.25]
Divorced/Sep	0.96***	[0.77,1.15]	0.87***	[0.59,1.16]	1.03***	[0.78,1.28]
Never Married	0.15*	[0.01,0.29]	0.13	[-0.05,0.32]	0.19	[-0.02,0.40]
Degree/Post Grad'	-0.10	[-0.24,0.04]	0.11	[-0.09,0.30]	-0.32**	[-0.52,-0.11]
Diploma/Voc'	-0.04	[-0.15,0.07]	0.04	[-0.11,0.20]	-0.14	[-0.30,0.02]
High School Quals ♀	0.00		0.00		0.00	
Low/No Quals	-0.09	[-0.05,0.24]	-0.09	[-0.29,0.10]	0.26*	[0.05,0.46]
Income (h/h)(log)	-0.13***	[-0.18,-0.08]	-0.09*	[-0.16,-0.02]	-0.15***	[-0.22,-0.07]
Employed ♀	0.00		0.00		0.00	
Unemployed	2.07***	[1.90,2.24]	2.29***	[2.07,2.50]	1.86***	[1.59,2.13]
Retired	0.31***	[0.13,0.49]	0.36*	[0.08,0.64]	0.25*	[0.02,0.48]
Family Care	0.83***	[0.70,0.96]	1.12***	[0.67,1.58]	0.77***	[0.63,0.91]
Long-term sick / Disabled	4.20***	[3.95,4.46]	4.35***	[3.98,4.71]	4.11***	[3.74,4.47]
_cons	6.87***	[6.24,7.51]	5.57***	[4.71,6.44]	9.09***	[8.17,10.00]
N	148824		68562		80262	
N_g	22881		10922		11959	
rho	0.38		0.39		0.37	

Legend: p<0.05 * p<0.01** p<0.001 ***

♀ = ***Reference Category***

Source: BHPS 1991-2008

Figure 1.14 Coefficient Plot - With and Without Subjective Health Status



Source: BHPS 1991-2008

4.4 Summary

Analysis of socio-demographic and socio-economic influences upon psychiatric morbidity and subjective well-being in the UK largely confirm well-known patterns of relationships. More advantaged educational and economic circumstances and cohabitation are associated with favourable outcomes, and gender and age are both related on average to well-being. However, these relationships are strongly influenced by the extent to which, if at all, controls are included for other objective health measures.

Chapter 5 - Labour Market Transitions and the Impact on Mental Health and Well-Being.

5. Introduction

As was demonstrated in Chapter 4 and is confirmed in numerous empirical studies, having a job and being employed is better for ones mental health and well-being than is being unemployed, in family-care roles or unable to work due to sickness or disability (Weich and Lewis, 1998; Paul and Moser, 2009). There is also much evidence to suggest that changes in labour-market status also affects mental health and well-being, where transitions into unemployment are found to be detrimental for mental health while transitions into employment are beneficial for mental health (Thomas et al. 2005; Flint et al. 2013). In this chapter, I will explore the impact that moving between and indeed remaining within various labour-market positions have on patterns of mental health and well-being. Broad labour-market transitions will be considered in the first instance, followed by intermediate labour-market transitions, and changes in mental well-being and likelihood of being a 'case' (potential minor psychiatric morbidity) following such transitions will be explored. All transitions and their subsequent impact on mental well-being will be considered by gender.

5.1 Aims and research questions to be addressed

1. What impact do broad transitions in labour-market status have on mental health and well-being?
2. What impact does intermediate transitions in labour-market status have on mental well-being?
3. Does the relationship between labour-market status and mental well-being differ by gender?
4. To what extent does previous 'caseness' status affect the likelihood of a person being a 'case' in the following year while controlling for labour-market transitions and socio-demographic and socio-economic characteristics?

5.1.1 Dataset

The British Household Panel Study (University of Essex, 2010) has been used for this analysis. Transitions in labour-market status are created by generating a lag of 'economic activity' across the panel for each respondent. However, due to the unbalanced nature of the data, it is not possible to lag all (or even the majority) of respondents' 'economic activity' across all 18 waves of the survey. Some people leave the survey for example, some leave and return, and others are simply not present in the survey at its inception. For those reasons, I have only lagged 'economic activity' for successive years. Broad labour-market transitions are reported in Table 3. and shown graphically in Figure 2.

5.2 Labour-market transitions and mental well-being

As Table 3. indicates, a total of 129,665 labour-market transitions have been recorded, where 59,265 are male observations and 70,400 are female observations. For men, over 80 percent of the transitions recorded relate to men who have remained employed from one year to the next (EMP-EMP), compared to 64 percent of female transitions that have occurred 'within-state' (being continuously employed from one year to the next). A similar proportion of transitions from employment to being out of the labour force (EMP-OLF) are reported for men (3 percent) and women (5 percent). The same is true for men and women moving from being out of the labour-force into employment (OLF-EMP) (3 percent) for men, (5 percent) for women. The last within-state transition that is reported in Table 3. is for people who have remained out of the labour force for successive years of the survey (OLF-OLF). While 13 percent of such transitions for men are reported, 26 percent are reported for females. It is not surprising that a larger proportion of females report being out of the labour force than do males since more females are engaged in family care roles (17 percent) than are males (1 percent).

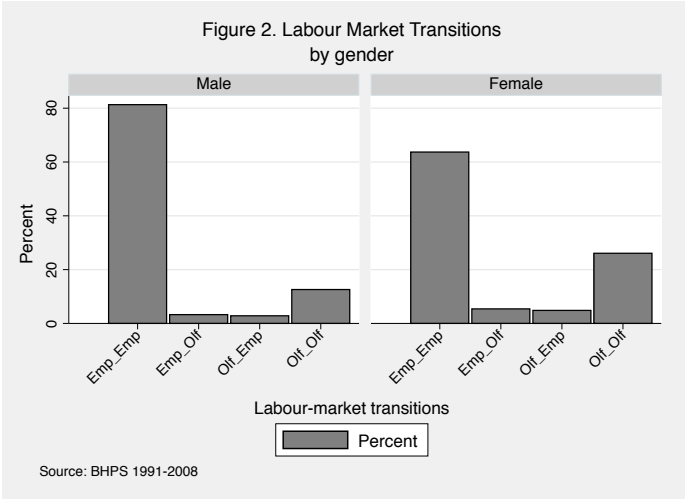
Figure 2.1 shows the mean and standard deviation of GHQ-12 scores for each of the labour-market transition categories. The bar-graph suggests that going from being out of the labour force, into employment (OLF-EMP) is associated with the lowest GHQ-12 scores and is the most beneficial for mental well-being of all the transition categories. This

is closely followed by the mean GHQ-12 scores reported for those who remain employed in successive waves (EMP-EMP), although more than one GHQ-12 point separates men and women in this category. Moving from employment to being out of the labour-force (EMP-OLF), and remaining out of the labour-force (OLF-OLF) in successive years report a similar mean GHQ-12 score for both men and women alike; around 13 points on the GHQ-12 scale in each instance and for both sexes.

Table 3. Labour-market transitions by gender

Employment Transition	Male obs/%	Female obs/%	Total obs/%
Emp - Emp	48,191	44,841	93,032
	81%	64%	72%
Emp - Olf	1,934	3,803	5,737
	3%	5%	4%
Olf - Emp	1,679	3,402	5,081
	3%	5%	4%
Olf - Olf	7,461	18,354	25,815
	13%	26%	20%
Total	59,265	70,400	129,665
	100%	100%	100%

Pearson chi2(3) = 5.0e+03 Pr = 0.000
Cramér's V = 0.1962
gamma = 0.4018 ASE = 0.005
Source: BHPS 1991-2008



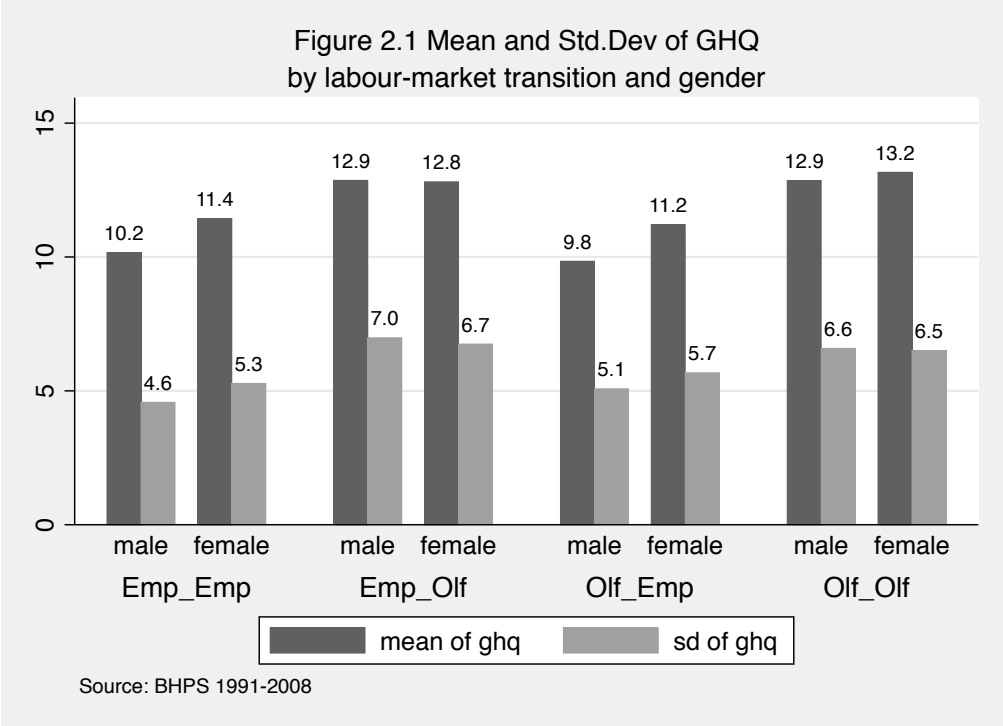


Table 3.1 shows the results from three separate regression models with robust standard errors, one for the entire sample (model 1), one for men (model 2) and another for females (model 3). Only labour-market transitions are included as covariates in these first three regression models, and other than being split by gender, there are no socio-demographic and/or socio-economic characteristics controlled for. This will allow the reader to see what the general impact on mental well-being that such transitions have before considering whether any of these associations are or remain significant when socio-demographic and socio-economic measures are taken into account. Figure 2.2 shows the coefficients from these three models graphically, 95% confidence intervals are also displayed. The reference category is (EMP-EMP); remaining employed for two or more successive years in the survey.

Compared to remaining employed for successive years (EMP-EMP), for both men and women, moving from a state of employment into non-employment (EMP-OLF) is associated with the largest positive effect on GHQ-12 scores (beta = 2.31, $p<0.001$) for men, and (beta = 1.10, $p<0.001$) for women. As the coefficient plots clearly shows, this transition is more detrimental (has a larger positive effect on the dependent variable) for men than it does for women. The same is also true when remaining out of the labour force for successive years is considered (OLF-OLF), (beta = 1.76, $p<0.001$) for men and (beta = 1.07, $p<0.001$) for females.

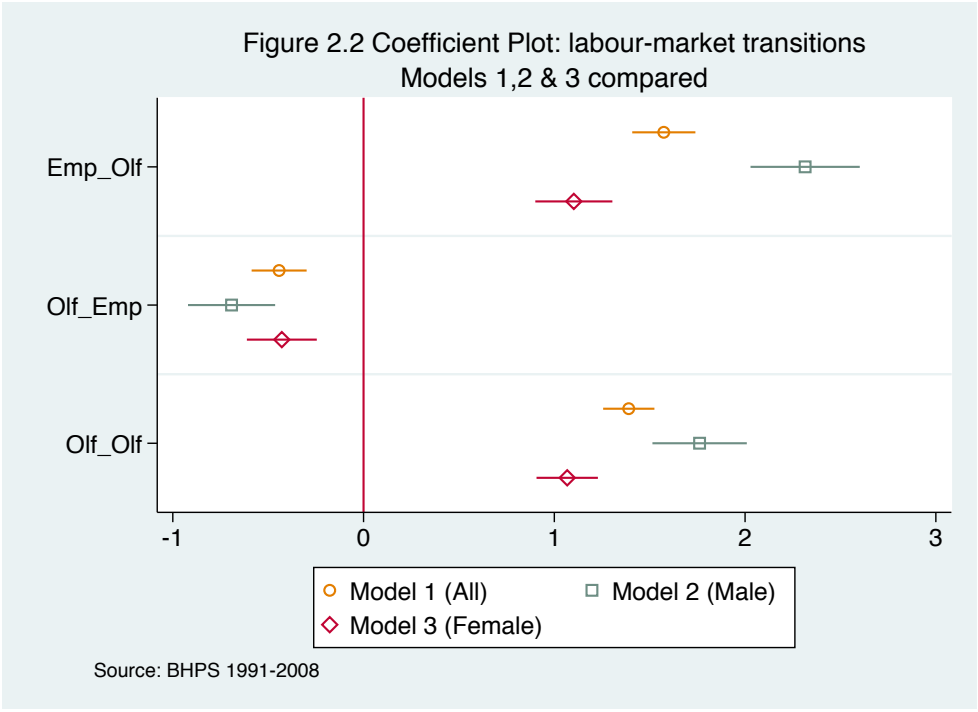
Table 3.1 Linear regression models with random effects and robust standard errors: Shows effect of broad labour-market transitions on mental well-being (GHQ-12 Likert scale)

GHQ-12	Model 1	(All)	Model 2	(Male)	Model 3	(Female)
(Likert scale)	b	[95% CI]	b	[95% CI]	b	[95% CI]
Emp-Emp ♀	0.00		0.00		0.00	
Emp-Olf	1.57***	[1.41,1.74]	2.31***	[2.03,2.60]	1.10***	[0.90,1.30]
Olf-Emp	-0.44***	[-0.59,-0.30]	-0.69***	[-0.92,-0.46]	-0.43***	[-0.61,-0.25]
Olf-Olf	1.39***	[1.26,1.52]	1.76***	[1.51,2.01]	1.07***	[0.91,1.23]
_cons	10.94***	[10.88,11.01]	10.29***	[10.21,10.37]	11.57***	[11.48,11.66]
N	129,665		59,265		70,400	
N_g	18,689		8,777		9,912	
rho	0.41		0.43		0.39	

Legend: $p<0.05$ * $p<0.01$** $p<0.001$ ***

♀ = ***Reference Category***

Source: BHPS 1991-2008



When transitions from being out of the labour-force into employment is considered (OLF-EMP), a relatively similar and negative effect on GHQ-12 scores for men and women are reported, (beta = -.69, p<0.001) and (beta = -.43, p<0.001) respectively. These initial results would suggest that the positive effect (increase GHQ-12 score and thus detrimental for mental health) that transitions from employment to being out of the labour-force elicit are stronger, or more detrimental to mental health, than is the negative effect (reduction in GHQ-12 and therefore beneficial effect) for mental health that transitions into employment from being out of the labour-force have. Moreover, the negative effect associated with (OLF-EMP) transition, is also stronger for men when compared to women. These findings echo those of Flint et al. (2013) who also found that the negative impact of moving out of employment was more detrimental for mental well-being than was the gain (or improvement) in mental health that moving into employment resulted in and also found that the negative effect was stronger for men than women.

The intraclass correlation (*rho*), is interpreted as being the proportion of variance that is explained by clustering (Rabe-Hesketh and Skrondal, 2012). In this sample, individual observations and clustered within individuals over time. Therefore, for men (model 2), 43 percent of variation in the response is explained by differences within individuals over time, and the remaining 57 percent is explained by differences between individuals over

time. For females (model 3), 39 percent of variation in the response is due to clustering within individuals over time, and 61 percent is explained by differences between individuals. This suggests that mental well-being is relatively more stable within individuals over time than it is unstable.

5.2.1 Socio-demographic and socio-economic controls and labour-market transitions

Socio-demographic and socio-economic covariates are added to the previous models and the results presented in Table 3.2. In Figure 6.4, the coefficients reported without socio-demographic and socio-economic factors are compared to those reported when these covariates are included. These comparisons are also split by gender. Thus model 2 and model 5 (male sample) are compared, and model 3 and model 6 (female sample) are compared. With regards to the labour-market transition dummy variables, being employed for two or more consecutive waves of the survey (EMP-EMP) serves as the reference category. There is not much difference in the size of the effect that each of the transition categories have on the dependent variable from those shown in Table 3.1 above, when compared to those in Table 3.2 below. For men, moving from being employed to being out of the labour-force (EMP-OLF) is still the most detrimental transition for men in terms of the increase in average GHQ-12 scores (beta = 2.39, $p<0.001$). This is also the case for females, where the same transition (EMP-OLF) is associated with the largest increase in GHQ-12 of all the categories (beta = 1.13, $p<0.001$). For each transition, the effect, whether positive or negative, on mental well-being is larger in the male sample than it is in the female sample. However, this gender disparity is lowest when comparing the effect of moving out of the labour force into employment (OLF-EMP), where the size and direction of the effect is similar for both men (beta = -.55, $p<0.001$) and women (beta = -.41, $p<0.001$).

The almost negligible difference in the coefficients before and after socio-demographic and socio-economic indicators are included in the models are clearly illustrated in Figure 6.4. What is also apparent from Figure 2.3 and Table 3.2 is that for both men and women, age and its quadratic function, and marital status categories (where being married is the reference category) are all significant. As reported in Chapter 5, as people get older and

reach middle-age, their mental well-being deteriorates, but as people move through middle-age their mental well-being improves, this inverse inverse 'U' shaped pattern is confirmed in model 5 (men) and model 6 (females) (Blanchflower and Oswald, 2008).

Table 3.2 Linear regression models with random effects and robust standard errors: Shows effect of broad labour-market transitions on mental well-being (GHQ-12 Likert scale) with socio-demographic and socio-economic explanatory measures

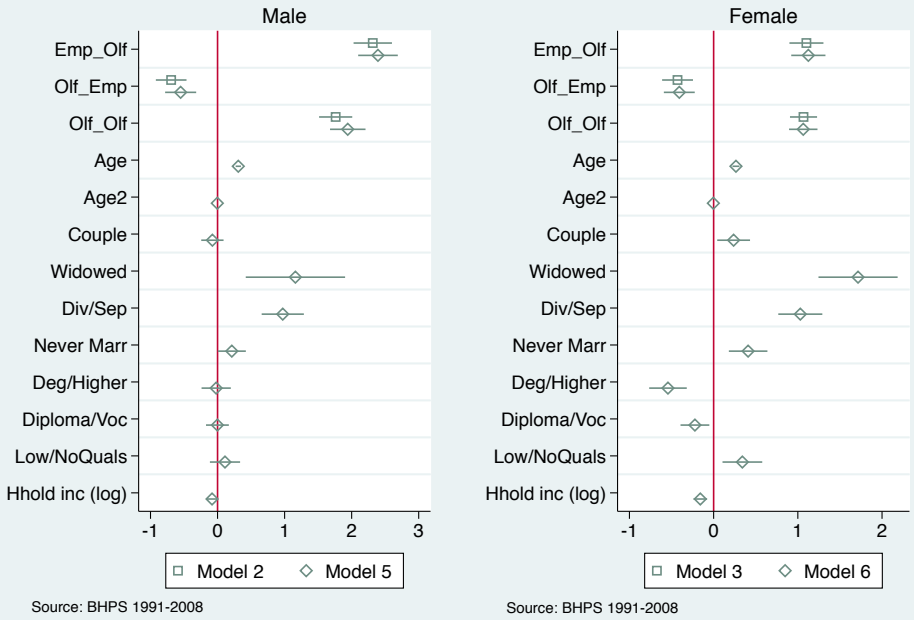
GHQ-Likert	Model 4	(All)	Model 5	(Male)	Model 6	(Female)
	b	[95% CI]	b	[95% CI]	b	[95% CI]
Emp-Emp ♀	0.00		0.00		0.00	
Emp-Olf	1.55***	[1.38,1.72]	2.39***	[2.10,2.69]	1.13***	[0.92,1.33]
Olf-Emp	-0.44***	[-0.58,-0.29]	-0.55***	[-0.78,-0.32]	-0.41***	[-0.59,-0.22]
Olf-Olf	1.34***	[1.20,1.48]	1.94***	[1.68,2.21]	1.06***	[0.90,1.23]
Male ♀	0.00				_	
Female	1.01***	[0.90,1.13]	_			
Age	0.28***	[0.25,0.31]	0.31***	[0.27,0.35]	0.27***	[0.22,0.31]
Age Squared	-0.00***	[-0.00,-0.00]	-0.00***	[-0.00,-0.00]	-0.00***	[-0.00,-0.00]
Married ♀	0.00		0.00		0.00	
Couple	0.10	[-0.03,0.23]	-0.08	[-0.24,0.09]	0.24*	[0.04,0.43]
Widowed	1.57***	[1.17,1.97]	1.16**	[0.42,1.90]	1.72***	[1.25,2.18]
Divorced/Sep	1.00***	[0.79,1.20]	0.97***	[0.66,1.29]	1.03***	[0.77,1.29]
Never Married	0.33***	[0.18,0.49]	0.21*	[0.00,0.42]	0.41***	[0.18,0.64]
Degree/PostGrad'	-0.27***	[-0.43,-0.11]	-0.02	[-0.24,0.20]	-0.54***	[-0.77,-0.32]
Diploma/Voc'	-0.11	[-0.23,0.02]	-0.00	[-0.17,0.17]	-0.22*	[-0.39,-0.05]
High School Quals ♀	0.00		0.00		0.00	
Low/No Quals	0.23**	[0.07,0.40]	0.11	[-0.11,0.34]	0.34**	[0.11,0.58]
Income (h/h)(log)	-0.15***	[-0.20,-0.09]	-0.08*	[-0.16,-0.00]	-0.16***	[-0.24,-0.08]
_cons	5.80***	[5.07,6.54]	4.68***	[3.66,5.70]	7.42***	[6.38,8.45]
N	129665		59265		70400	
N_g	18,689		8,777		9,912	
rho	0.39		0.42		0.38	

Legend: p<0.05 * p<0.01** p<0.001 ***
♀ = ***Reference Category***

Source: BHPS 1991-2008

For both men and women, compared to being married, widowhood and being divorced or separated is associated with an increase in GHQ-12 scores, again giving weight to the claim that marriage is beneficial for mental well-being. Household monthly income also elicits a negative (and therefore beneficial) effect on GHQ-12 scores, although this is stronger in the female sample (beta = -.16, $p<0.001$) than the male sample (beta = -.08, $p<0.05$).

Figure 2.3 Comparing coefficients with and without controls



Where disparities between the male and female sample are most apparent concerns the impact that educational attainment has on mental well-being. For men, compared to those with 'high-school level' qualifications such as higher's or A-level's, none of the educational attainment categories are found to have a significant effect on mental well-being. Conversely, for females, the beneficial impact that education (or at least qualifications) have on mental well-being is demonstrated. Even having a diploma or vocational qualification, when compared to having high-school level qualifications is associated with a negative and significant effect on average GHQ-12 scores (beta = -.22, $p<0.05$). Having low-level qualifications or not having any qualifications results in an increase in GHQ-12 scores (beta = .34, $p<0.01$).

5.3 Caseness and employment transitions

In order that I might explore further the impact that broad labour-market transitions have on mental well-being, and as Thomas et al. (2005) considered in their analysis, I will now estimate the likelihood of being a 'case' while controlling for labour-market transitions and socio-demographic and socio-economic characteristics. The outcome in this instance is the 'caseness' measure which is derived from the responses given to the GHQ-12 (Goldberg et

al. 1988). The caseness measure is dichotomised where a score of 3 or more is indicative of the presence (or at least potential presence) of minor psychiatric morbidity. There is some dubiety surrounding this threshold and there are examples where a score of 4 or more is applied (Lambert and Dougall, 2010). In Table 3.3, the results from two (one for men and the other women) logistic regression models are presented, where the beta coefficients are interpreted as the log odds of being a 'case'.

I will mention only briefly the likelihood of being a 'case' across the socio-demographic and socio-economic indicators since these have been discussed in some detail in previous chapters of this thesis. Age increases the log-odds of being a case for both men and women, compared to people who are 'married', for men, being 'widowed' or 'divorced' increases the likelihood of being a 'case', while for females, all alternative marital status categories (compared to being married) increases the log-odds of being a 'case'. Having a degree/post graduate qualification increases the log-odds of being a 'case' for men (compared to having 'high-school level qualifications'). For females, having low/no qualifications increases the likelihood of being a 'case'. As income increases, the likelihood of being a 'case' decreases, which is almost identical in its effect for both the male and female sample.

Table 3.3 Logistic regression models with robust standard errors: Reporting log odds of being a 'case' and shows this effect in relation to broad labour-market transitions and controlling for socio-demographic and socio-economic indicators

Caseness: (GHQ-12>3)	Model 7 (Male)			Model 8 (Female)		
	b	se	[95% CI]	b	se	[95% CI]
Emp-Emp ♀	0.00			0.00		
Emp-Olf	1.29***	(0.07)	[1.15,1.43]	0.69***	(0.05)	[0.59,0.78]
Olf-Emp	0.03	(0.08)	[-0.13,0.19]	-0.08	(0.05)	[-0.18,0.02]
Olf-Olf	1.05***	(0.07)	[0.92,1.19]	0.44***	(0.04)	[0.36,0.52]
Age	0.12***	(0.01)	[0.10,0.15]	0.07***	(0.01)	[0.05,0.09]
Age Squared	-0.00***	(0.00)	[-0.00,-0.00]	-0.00***	(0.00)	[-0.00,-0.00]
Married ♀	0.00			0.00		
Couple	-0.00	(0.06)	[-0.11,0.11]	0.12*	(0.05)	[0.03,0.22]
Widowed	0.56**	(0.21)	[0.15,0.98]	0.67***	(0.11)	[0.46,0.87]
Divorced/Sep	0.57***	(0.08)	[0.41,0.73]	0.47***	(0.05)	[0.36,0.58]
Never Married	0.11	(0.06)	[-0.02,0.24]	0.15**	(0.06)	[0.04,0.26]
Degree/Post Grad'	0.25***	(0.07)	[0.11,0.39]	-0.01	(0.06)	[-0.12,0.11]
Diploma/Voc'	0.05	(0.06)	[-0.05,0.16]	-0.04	(0.04)	[-0.13,0.04]
High School Quals ♀	0.00			0.00		
Low/No Quals	0.02	(0.07)	[-0.12,0.16]	0.11*	(0.06)	[0.01,0.22]
Income (h/h)(log)	-0.10***	(0.02)	[-0.14,-0.05]	-0.10***	(0.02)	[-0.14,-0.06]
_cons	-3.48***	(0.34)	[-4.14,-2.82]	-1.80***	(0.26)	[-2.31,-1.28]
lnsig2u (logged variance of random effect)						
_cons	1.02***	(0.03)	[0.96,1.09]	0.83***	(0.03)	[0.77,0.89]
N	59,265			70,400		
N_g	8,777			9,912		
rho	0.46			0.41		
log Likelihood	-26399.56			-37440.85		
bic	52963.96			75049.13		

Legend: p<0.05 * p<0.01** p<0.001 ***

♀ = ***Reference Category***

Source: BHPS 1991-2008

With regards to the likelihood of being a 'case' when labour-market transitions are concerned, for men, moving from a state of 'employment' into 'non-employment' (EMP-OLF) increases the log-odds of being a case by (beta = 1.29, p<0.001), while for females this same transition increases log-odds by (beta = .69, p<0.001). Remaining out of the labour-force for two or more consecutive waves (OLF-OLF) also significantly increases the log-odds of being a case for men (beta = 1.05, p<0.001) and for women (beta = .44, p<0.001). Finally, compared to remaining employed for two of more successive waves (EMP-EMP), moving from being out of the labour-force to being employed (OLF-EMP) does not significantly affect the log-odds of being a case for either the male (model 7) or female (model 8) samples. These results are somewhat similar to those reported in Table 3.2 when the outcome was the continuous version of the GHQ-12 (Likert scale). The detrimental effect (in this instance, increasing the log-odds of being a case) of moving from 'employment' to being 'out of the labour-force' is greater for men than it is for women, and remaining out of the labour-force is also worse for men than it is for females.

However, while moving back into employment from non-employment significantly reduced GHQ-12 scores in Table 3.2, this same transition was not significant when the dichotomous (caseness) mental well-being measure is utilised (as in Table 3.3).

5.3.1 Likelihood of 'caseness' given previous 'caseness' status

Exploring further the impact that employment transitions have on mental well-being I have included a lagged dependent variable ('caseness') to the models and estimate the log of the odds of being a 'case' given that they were (or were not) a 'case' in the previous year (wave). Socio-demographic and socio-economic characteristics are controlled for, as are labour-market transitions. The resultant logistic regression models are estimated with robust standard errors to account for unobserved heterogeneity and are presented in Table 3.4.

Table 3.4 Multilevel logistic regression models with robust standard errors: Reporting log odds of being a 'case' and shows this effect in relation to previously being a 'case' (lagged dependent variable LDV), broad labour-market transitions and controlling for socio-demographic and socio-economic indicators

Caseness: (GHQ-12>3)	Model 9 (Male)			Model 10 (Female)		
	b	se	[95% CI]	b	se	[95% CI]
Previously a 'case' (LDV) ♀	1.07***	(0.04)	[0.99,1.15]	0.90***	(0.03)	[0.84,0.96]
Emp-Emp ♀	0.00			0.00		
Emp-Olf	1.22***	(0.07)	[1.08,1.37]	0.67***	(0.05)	[0.58,0.76]
Olf-Emp	-0.18*	(0.09)	[-0.35,-0.01]	-0.17**	(0.05)	[-0.28,-0.06]
Olf-Olf	0.93***	(0.06)	[0.82,1.05]	0.36***	(0.04)	[0.29,0.43]
Age	0.10***	(0.01)	[0.08,0.12]	0.07***	(0.01)	[0.05,0.09]
Age Squared	-0.00***	(0.00)	[-0.00,-0.00]	-0.00***	(0.00)	[-0.00,-0.00]
Married ♀	0.00			0.00		
Couple	-0.00	(0.05)	[-0.10,0.10]	0.14**	(0.04)	[0.06,0.23]
Widowed	0.39***	(0.19)	[0.01,0.76]	0.66***	(0.09)	[0.49,0.84]
Divorced/Sep	0.44***	(0.07)	[0.30,0.58]	0.42***	(0.05)	[0.32,0.51]
Never Married	0.07	(0.06)	[-0.04,0.18]	0.20***	(0.05)	[0.10,0.30]
Degree/Post Grad'	0.25***	(0.06)	[0.13,0.37]	-0.03	(0.05)	[-0.13,0.07]
Diploma/Voc'	0.07	(0.05)	[-0.02,0.17]	-0.02	(0.04)	[-0.09,0.06]
High School Quals ♀	0.00			0.00		
Low/No Quals	0.01	(0.06)	[-0.11,0.13]	0.11*	(0.05)	[0.02,0.21]
Income (h/h)(log)	-0.08***	(0.02)	[-0.12,-0.03]	-0.08***	(0.02)	[-0.11,-0.04]
_cons	-3.82***	(0.30)	[-4.41,-3.23]	-2.69***	(0.24)	[-3.16,-2.23]
lnsig2u (logged variance of random effect)						
_cons	0.39***	(0.05)	[0.29,0.49]	0.27***	(0.04)	[0.19,0.35]
N	59,265			70,400		
N_g	8,777			9,912		
rho	0.31			0.29		
log Likelihood	-22331.43			-33185.64		
bic	44838.71			66549.87		

Legend: p<0.05 * p<0.01** p<0.001 ***

♀ = ***Reference Category***

Source: BHPS 1991-2008

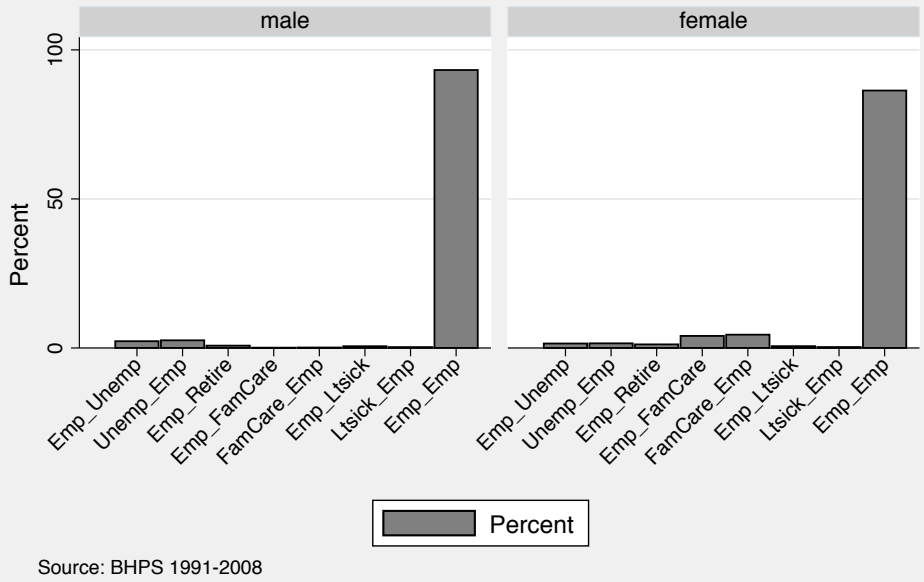
The log-odds of being a 'case', given that a person was previously a 'case', perhaps unsurprisingly, increases the log of the odds of being a case for both men (beta = 1.07, $p<0.001$) and women (beta = .90, $p<0.001$). The effect on the likelihood of being a 'case' in relation to labour-market transitions have not changed much from the previous models (in Table 3.3). Moving from a state of 'employment' to being 'out of the labour-force' (EMP-OLF) still increased the likelihood of being a 'case' for men and women, and remaining 'out of the labour-force' (OLF-OLF) also increased the log of the odds of being a case. However, whereas previously not significant when previous 'caseness' status was not included in the models (in Table 3.3), the transition from being 'out of the labour-force' into 'employment' (OLF-EMP), when the lagged dependent variable is included in the models (Table 3.4) is significant, lowering the log of the odds of being a 'case' in both the male (beta = -.18, $p<0.05$) and female (beta = -.17, $p<0.01$) samples. These results indicate that the detrimental effect of moving into 'non-employment' is worse (increases the likelihood of being a 'case') than is the beneficial (reducing the likelihood of being a 'case') effect of moving back into 'employment' from being out of the labour-force'. Moreover, transitions out of employment or remaining out of employment for successive years are more detrimental for mens mental well-being than they are for women, although the beneficial impact of moving into employment is almost identical for both men and women.

5.4 Exploring intermediate labour-market transitions by gender

In this section, I will explore intermediate labour-market transitions and consider the impact that these transitions have on mental health, measured using both GHQ-12 and also 'caseness' when previous 'caseness' status is included (the lagged dependent variable, LDV). In the previous section, broad transitions have been considered, however, moving from a state of employment to being out of the labour-force (EMP-OLF) for example, concerns people who have moved from employed into unemployment, retirement, family care-roles and long-term sick/disabled status. These transitions are likely to vary in terms of the impact that they have on mental well-being and the likelihood of becoming, remaining, or reducing the likelihood of being a case.

As there are five labour-market categories, there are a total of 25 possible transitions, 20 from one to another labour-market category, and five 'within-state' (i.e. remaining in any one of the labour-market categories for two or more successive years in the survey). I have chosen to focus on seven intermediate labour-market transitions and one within-state (EMP-EMP). Figure 2.4 shows the distribution of these eight labour market transition categories by gender.

Figure 2.4 Intermediate labour-market transitions by gender



Source: BHPS 1991-2008

Table 3.5 shows each of the transitions and the number of observations (and their percentage within each transition), and italicised and in bold are the mean GHQ-12 score and its standard deviation (in parenthesis). Mean GHQ-12 and its standard deviation by intermediate labour-market transitions are displayed graphically in Figure 2.5. Of all of the transitions included in Table 3.5, remaining employed for two or more successive waves of the survey (EMP-EMP) is recorded the most often (93 percent for men, and 86 percent for women), which is of no surprise since the majority of the BHPS sample are employed in each wave of the survey.

The gendered nature of labour-market transitions are apparent. For men, excluding (EMP-EMP), the next most frequently occurring labour-market transition is moving from unemployment into employment (UNEMP-EMP) (1,330 observations), this is closely

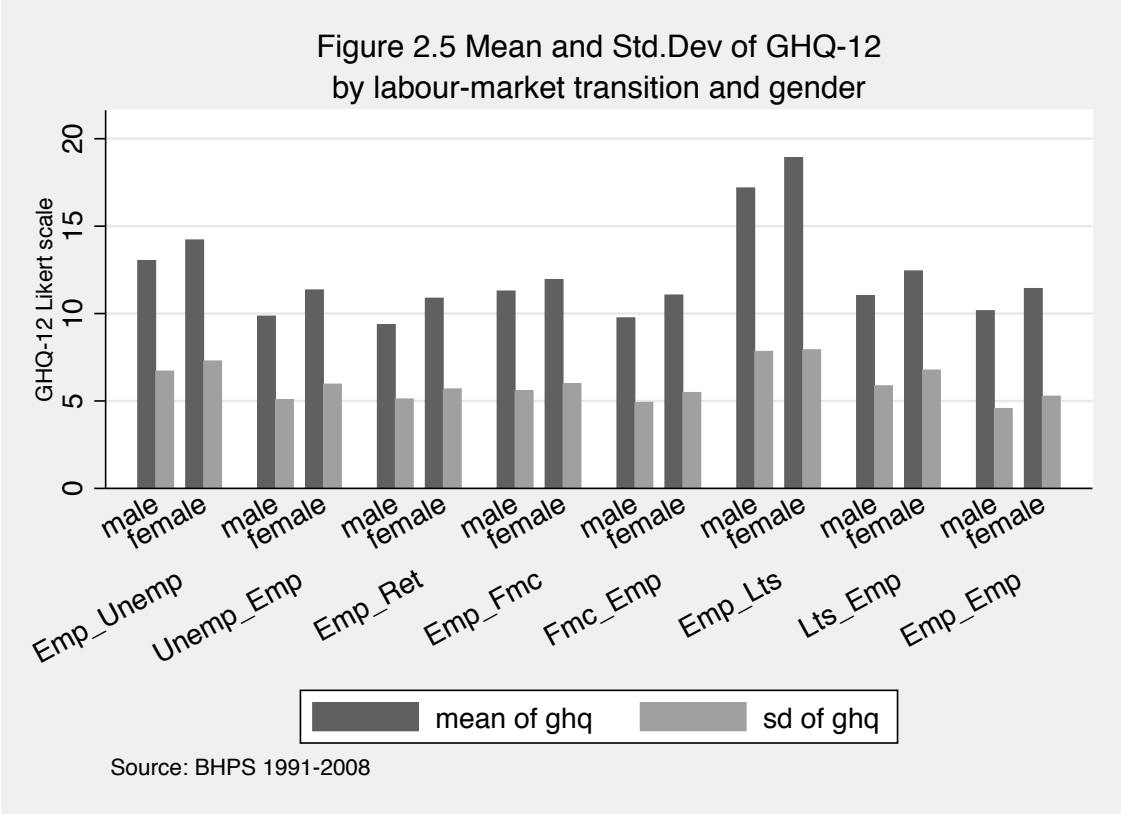
followed by transitions from unemployment into employment (EMP-UNEMP) (1,172 observations). The next most popular transition for men is recorded for moving into retirement from employment (EMP-RETIRE) (406 observations are reported), then moving from employment into long-term sickness (EMP-LTS) and its reverse transition of moving into employment from long-term sickness (LTS-EMP). The final two labour-market transitions; moving from family-care roles into employment (FMC-EMP) and moving from employment into family-care roles (EMP-FMC), report 83 and 55 observations respectively.

With regards to female labour-market transitions and excluding (EMP-EMP) in the first instance. The most frequently occurring transition concerns females moving from family-care roles into employment (FMC-EMP) (2,399 observations), followed by its reverse, transitions from employment into family-care roles (EMP-FMC) (2,148). These two aforementioned transitions were the least frequently occurring in the male sample. From here, the chronological order of the remaining five transitions in terms of the the most to the least frequently occurring, mirrors that of the male sample; moving from unemployment into employment (UNEMP-EMP), from unemployment into employment (EMP-UNEMP), employment to retirement (EMP-RETIRE), employment to long-term sickness (EMP-LTS) and the least frequent transition, moving from long-term sickness into employment (LTS-EMP).

Table 3.5 Intermediate labour-market transitions by gender. Showing observations, mean GHQ & std dev of GHQ

Employment Transition	Male (obs,%) *Mean GHQ (std.dev)*	Female (obs,%) *Mean GHQ (std.dev)*	Total (obs,%) *Mean GHQ (std.dev)*
Employed - Unemployed	1,172 (2%) ***13 (6.7)***	777 (1%) ***14 (7.3)***	1,949 (2%) ***13.5 (7)***
Unemployed - Employed	1,330 (3%) ***9.8 (5.1)***	801 (2%) ***11.3 (6)***	2,131 (2%) ***10.4 (5.5)***
Employed - Retire	406 (1%) ***9.3 (5.1)***	622 (1%) ***10.9 (5.7)***	1,028 (1%) ***10.3 (5.5)***
Employed - FamCare	55 (.1%) ***11.3 (5.6)***	2,093 (4%) ***12 (6)***	2,148 (2%) ***11.9 (6)***
FamCare - Employed	83 (.2%) ***9.8 (4.9)***	2,316 (4%) ***11 (5.5)***	2,399 (2%) ***11 (5.5)***
Employed - Lt/sick	301 (1%) ***17.1 (7.8)***	311 (1%) ***18.9 (7.9)***	612 (1%) ***18.1 (7.9)***
Lt/sick - Employed	149 (.2%) ***11 (5.9)***	163 (.3%) ***12.4 (6.8)***	312 (.3%) ***11.8 (6.4)***
Employed - Employed	48,191 (93%) ***10.2 (4.6)***	44,841 (86%) ***11.4 (5.3)***	93,032 (90%) ***10.8 (5)***
Total	51,687	51,924	103,611

Source: BHPS 1991-2008



In Table 3.5 the mean GHQ-12 score and standard deviation for each of the labour-market transitions are reported. These figures are also illustrated in Figure 2.5. The overall pattern between the male and female sample in terms of the transitions which report the lowest mean GHQ-12 scores (indicative of good/positive mental well-being), and the highest GHQ-12 scores (indicative of poor mental well-being), are almost identical. In each instance, moving from employment into retirement (EMP-RETIRE) record the lowest mean GHQ-12 scores (9.3 for men and 10.9 for females). As might be expected, the most detrimental transition resulting in the highest mean GHQ-12 score is recorded for transitions from employment to being long-term sick/disabled (17.1 for men and 18.9 for females). Moving from employment into unemployment (EMP-UNEMP) is the second most detrimental transition for both men and women.

5.5 Labour-market transitions and mental well-being by gender

In Table 3.6, the results from four multilevel models with random effects are estimated and compared. In each instance, the outcome is the GHQ-12 Likert scale, which is treated as a

continuous measure. Socio-demographic and socio-economic characteristics are controlled for but are not directly reported in the table as these have been discussed in detail in previous sections of this chapter. Being employed for two or more consecutive waves of the survey is the labour-market transition reference category. The male and female samples are considered separately and comparisons are made between models with and without the inclusion of previous 'caseness' (LDV). A coefficient plot that compares Model 12 and Model 14 is also presented in Figure 2.6.

Table 3.6 Linear regression models with random effects and robust standard errors: Controlling for socio-demographic and socio-economic characteristics, labour-market transitions and with/without previous 'caseness' in male and female BHPS sample

GHQ-12 Likert Scale	Model 11 (male)	Model 12 (male) Including (LDV)	Model 13 (female)	Model 14 (female) Including (LDV)
	b [95% ci]	**b [95% ci]**	**b [95% ci]**	**b [95% ci]**
Emp-Emp ♀	0.00	0.00	0.00	0.00
Emp-Unemp	2.65***	2.58***	2.14***	2.02***
	[2.41,2.90]	[2.33,2.82]	[1.80,2.48]	[1.68,2.36]
Unemp-Emp	-0.39***	-0.65***	-0.27	-0.49**
	[-0.61,-0.16]	[-0.88,-0.43]	[-0.61,0.06]	[-0.83,-0.16]
Emp-Retire	-1.00***	-1.08***	-0.74***	-0.76***
	[-1.41,-0.58]	[-1.49,-0.67]	[-1.13,-0.35]	[-1.15,-0.36]
Emp-FamCare	0.83	0.65	0.50***	0.47***
	[-0.24,1.89]	[-0.41,1.71]	[0.28,0.71]	[0.25,0.68]
FamCare-Emp	-1.05*	-0.96*	-0.45***	-0.56***
	[-1.93,-0.17]	[-1.84,-0.09]	[-0.65,-0.24]	[-0.76,-0.35]
Emp-Lt/sick	5.91***	5.69***	5.97***	5.80***
	[5.44,6.38]	[5.22,6.16]	[5.43,6.51]	[5.27,6.34]
Lt/sick-Emp	-0.09	-0.50	-0.35	-0.71
	[-0.75,0.57]	[-1.15,0.16]	[-1.09,0.39]	[-1.44,0.03]
Previously a	_	1.52***	_	1.50***
'case'(LDV) ♀	_	[1.42,1.63]	_	[1.39,1.61]
_cons	6.41***	6.34***	9.54***	9.17***
	[5.55,7.27]	[5.50,7.18]	[8.56,10.53]	[8.21,10.14]
sigma_u (var between subjects)				
_cons	2.89***	2.58***	3.18***	2.82***
	[2.83,2.96]	[2.51,2.64]	[3.11,3.25]	[2.75,2.90]
sigma_e (var within subjects)				
_cons	3.72***	3.74***	4.38***	4.41***
	[3.70,3.75]	[3.71,3.76]	[4.35,4.41]	[4.38,4.44]
N	51,687	51,687	51,924	51,924
N_g	7,814	7,814	8,050	8,050
rho	0.38	0.32	0.35	0.29
ll	-146831.23	-146398.70	-155681.08	-155292.72
bic	293879.51	293025.31	311579.31	310813.44

Legend: p<0.05 * p<0.01** p<0.001 ***
LDV = Lagged dependent variable (previously being a case)
♀ = ***Reference Category***

Source: BHPS 1991-2008

Before considering the results in Table 3.6 in detail, a general point can be made about the impact that including and not including the lagged dependent variable (LDV) in the models

has on the coefficient. Where an association between a labour-market transition and mental well-being is positive (detrimental for mental health), the inclusion of the LDV serves to reduce, albeit slightly, the size of the effect. Conversely, when a labour-market transition results in a negative effect (thus improving mental well-being), when the LDV is included in the model, this negative effect increases (i.e. increasing the beneficial impact associated with the transition). This change in the size of the effect is relatively small, and does not affect the direction of influence or its statistical significance, except for in the female sample (Model 13 and Model 14) where the negative effect that moving from 'unemployment' to 'employment' (UNEMP-EMP) is not significant in Model 13 (without LDV), but once the LDV is included in the model this transition is significant (beta = -.49, $p<0.05$) (in Model 14).

As the results in Table 3.6 also demonstrate, compared to people who have remained employed (EMP-EMP), the most detrimental transition for both men and women across each of the regression models is moving from 'employment' to being 'long-term sick/ disabled' (EMP-LTS), increasing the coefficient by almost 6 points in both the male and female sample ($p<0.001$). The reverse of this transition (LTS-EMP) is found not to significantly affect average GHQ-12 scores in any of the models. However, making the transition from being long-term sick into employment does not necessarily mean that their reasons for being long-term sick have changed, or even that a person is 'fit' to return to employment for example; it simply means that they have returned to work from a previous state of long-term sickness. Also detrimental for mental well-being is moving from 'employment' to 'unemployment' (EMP-UNEMP), which as was discussed previously, results in larger (more detrimental) effect on GHQ-12 scores in the male sample (beta = 2.65, $p<0.001$ in model 11) than in the female sample (beta = 2.14, $p<0.001$ in model 13). The positive (and therefore detrimental) impact that becoming unemployed incurs is larger than is the negative (beneficial) impact associated with moving out of unemployment into employment.

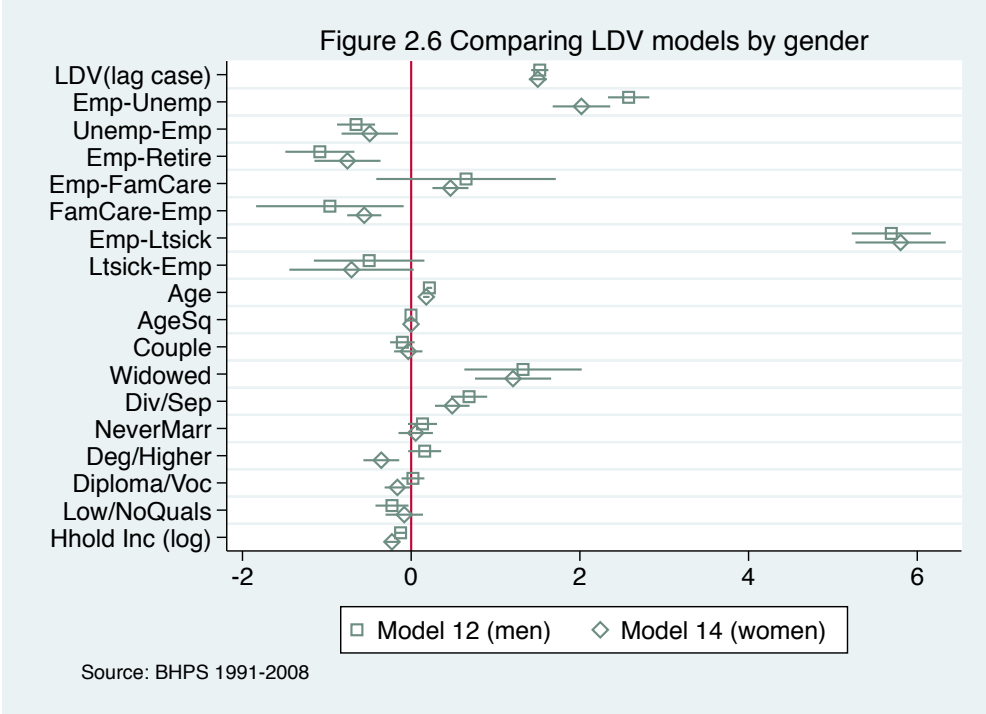
For both men and women, moving from 'family-care roles' into 'employment' (FMC-EMP) improves mental well-being, eliciting a negative and significant impact on the outcome. However, moving from employment' into 'family-care roles' produces a positive

and significant effect on mental well-being for females (beta = .50, p<0.001, model 13), but is not associated with a signifiant effect on the response in the male sample models. Retirement is beneficial for mental well-being, reducing the coefficient for both men and women. Previously being a case, which is the lagged dependent variable, reports an almost identical positive effect on the outcome (beta = 1.52, p<0.001) for men and (beta = 1.50, p<0.001) for females.

With regards to the random part of the model, there is less variation in the response between subjects than there is within subjects over time. However, when the LDV is added to the models, between subject variation decreases from (beta = 2.89, p<0.001 to beta = 2.58, p<0.001) in the male sample, and from (beta = 3.18, p<0.001 to beta = 2.82, p<0.001) in the female sample. Comparing the male and female samples, it is clear that there is more variation in the response both between subjects and within subjects over time in the female sample. Looking at the intraclass correlation statistic (ICC) or *rho,* which provides a measure of the variation in the response that is present at the group level (level-2) or between individuals over time. When the LDV is excluded from the model, 38 percent of variation in GHQ-12 is explained by differences between groups (individuals in this instance) for men, leaving the remainder of 62 percent of variation explained by differences within males over time. For females, without the inclusion of the LDV, 35 percent of variation in the response is explained by differences between groups (individuals), while 65 percent is due to differences within females. When the LDV is included in the models, this has the effect of reducing the amount of variation explained at the group level (reducing the *rho* statistic by 6 percent in both the male and female models). Thus by implication, controlling for previous 'caseness', increases the amount of variation that is explained by differences within individuals over time.

Figure 2.6 shows plots the coefficients for the LDV models, comparing the male (Model 12) and female (Model 14) models. All of the covariates that were included in the models are reported here also. What is most apparent is the large positive effect that moving from EMP-LTS has on GHQ-12 scores. Similarly, going from being EMP-UNEMP also stands out from the other coefficients, increasing GHQ-12 scores. Clearly beneficial (reducing average GHQ-12 scores) are transitions into employment from unemployment (UNEMP-

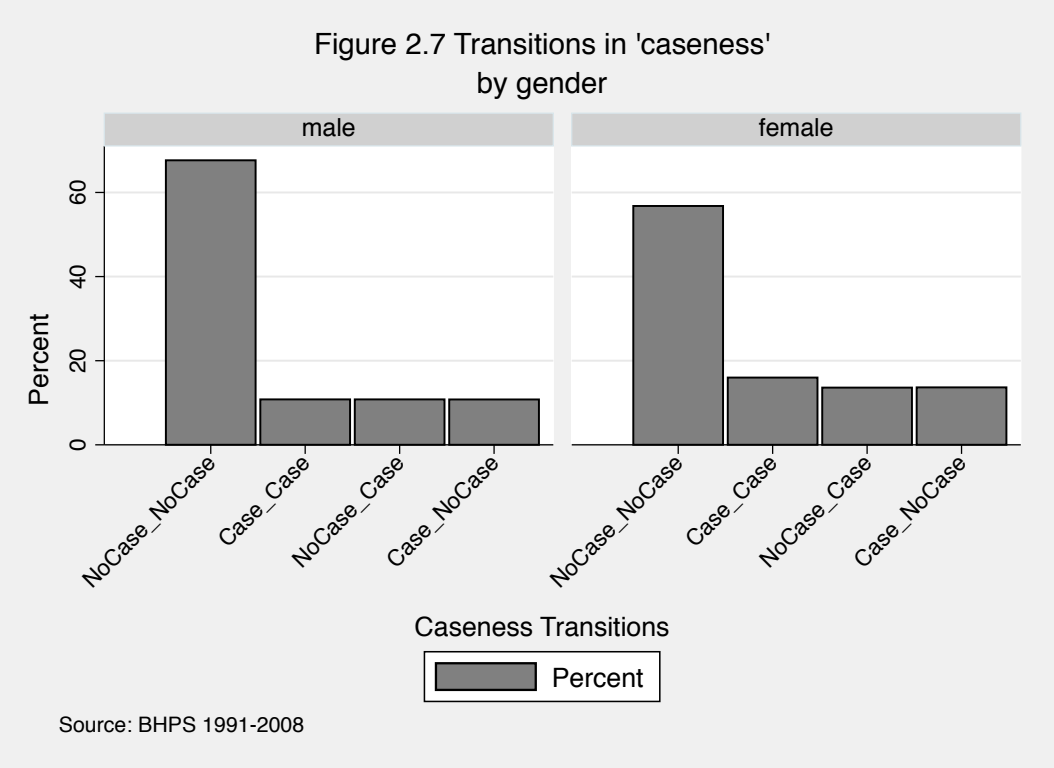
EMP) and from family-care roles into employment (FMC-EMP). However, the large confidence intervals for men where family-care role transitions are concerned are also evident.



5.6 Transitions in 'caseness' following labour-market transitions

In the series of tables that follow, transitions in 'caseness' are explored in relation to broad transitions in labour-market status, and then in relation to intermediate transitions in labour market status. More precisely, I am interested in examining the extent to which people remain a 'case' or remain a 'non-case', or whether they change from being a 'case' to a 'non-case', or from being a 'non-case' to a 'case' following various labour-market transitions. Table 6.8 shows the distribution of transitions in 'caseness' by gender which is also illustrated graphically in Figure 2.7.

Table 3.7		Transitions in 'caseness' by gender				
Caseness Transition		Male		Female		Total
		%		%		%
NoCase_NoCase		40,089	39,970	80,059		
		67.64		***56.78***		***61.74***
Case_Case		6,395		11,252	17,647	
		10.79		***15.98***		***13.61***
NoCase_Case	6,395	9,568		15,963		
		10.79		***13.59***		***12.31***
Case_NoCase	6,386	9,610		15,996		
		10.78		***13.65***		***12.34***
Total		59,265	70,400	129,665		
		100		***100***		***100***
Pearson chi2(3) = 1.7e+03		Pr = 0.000				
Cramér's V = 0.1136						
Source: BHPS 1991-2008						



There are four possible 'caseness' transitions, two of which are within-states; remaining a 'non-case' for two or more consecutive waves (NoCase-NoCase), and remaining a 'case' for two or more consecutive waves (Case-Case). Two involve transitions in caseness; from being a 'non-case' to being a 'case' (NoCase-Case) and from being a 'case' to being a 'non-case' (Case-NoCase). Of the 59,265 'caseness' transitions reported for men, the most frequently occurring is remaining a 'non-case' (NoCase-NoCase) which accounts for almost 68 percent of all caseness transitions. With regards to the other three possible

'caseness' transitions, just over 10 percent of men in each instance, have remained a 'case' (Case-Case); went from being a 'case' to a 'non-case' (Case-NoCase) or changed from being a 'non-case' to a 'case' (NoCase-Case). With regards to the female sample, a total of 70,400 transitions in 'caseness' are reported, where approximately 57 percent remain a 'non-case' (NoCase-NoCase), 16 percent remained a 'case' (Case-Case) and approximately 14 percent in each instance moved from being a 'non-case' to a 'case' (NoCase-Case) and its reverse (Case-NoCase).

In the following cross-tabulations, broad labour-market transitions will be considered in relation to transitions in 'caseness'. Table 3.8 shows the descriptive statistics for men, and Table 3.9 relates to the female sample.

Table 3.8 Distribution of transitions in caseness across broad labour-market transitions (Men)

Labour Market Transition	Caseness Transitions				
	NoCase_NoCase	Case_Case	NoCase_Case	Case_NoCase	Total
	obs / %	obs / %	obs /%	obs / %	obs / %
Emp_Emp	34,256	3,971	5,071	4,893	48,191
	71.08	***8.24***	***10.52***	***10.15***	***100***
Emp_Olf	1,006	355	390	183	1,934
	52.02	***18.36***	***20.17***	***9.46***	***100***
Olf_Emp	938	229	124	388	1,679
	55.87	***13.64***	***7.39***	***23.11***	***100***
Olf_Olf	3,889	1,840	810	922	7,461
	52.12	***24.66***	***10.86***	***12.36***	***100***
Total	40,089	6,395	6,395	6,386	59,265
	67.64	***10.79***	***10.79***	***10.78***	***100***

Pearson chi2(9) = 2.6e+03 Pr = 0.000
Cramér's V = 0.1219

Notes: The percentage reported in rows shows the proportion of observations per caseness transition that is associated with each of the labour-market transitions. The row total at the foot of the table show the distribution of observations present within each of the caseness transitions categories.
Source: BHPS 1991-2008

Employment transitions have been discussed previously, however, remaining employed (EMP-EMP) is the most frequently occurring, accounting for just over 80 percent of all labour-market transitions. Approximately 13 percent of men have remained out of the labour-force (OLF-OLF) for two consecutive years, with approximately 3 percent of men in each instance, moving from employment to being out of the labour-force (EMP-OLF) or its reverse (OLF-EMP).

The descriptive statistics in Table 3.8 shows that just over 71 percent of men who remained employed (EMP-EMP), remained 'non-cases' (NoCase-NoCase). Only 8 percent of men

who were EMP-EMP remained a case (Case-Case), with just over 10 percent in each instance reporting moving from being a ‘case’ to a ‘non-case’ (Case-NoCase) or vice versa (NoCase-Case). For those men who moved from a state of employment into non-employment (EMP-OLF), just over half (52 percent) remained a ‘non-case’ (NoCase-NoCase), while 20 percent of men who underwent this transition (EMP-OLF) moved from being a ‘non-case’ to a ‘case’ (NoCase-Case), while 18 percent remained a ‘case’ (Case-Case) during the EMP-OLF transition. When we consider moving into employment from being out of the labour-force (OLF-EMP), almost 56 percent of men remained a ‘non-case’, while 23 percent of men who moved into employment from non-employment also changed from being a ‘case’ to a ‘non-case’ (Case-NoCase). Just over half of men who remained out of the labour-force (OLF-OLF) remained a ‘non-case’ (NoCase-NoCase), while a quarter remained a ‘case’ following this within-state transition.

Turning attention to Table 3.9 and the female sample; of those females who remained employed (EMP-EMP), just over 60 percent remained a ‘non-case’ (NoCase-NoCase), while around 13 percent in each instance remained a ‘case’ (Case-Case), or changed from being a ‘non-case’ to a ‘case’ (NoCase-Case) or from a ‘case’ to a ‘non-case’ (Case-NoCase). For those females who have moved from being out of the labour-force into employment (OLF-EMP), around 20 percent also reported moving from being a ‘case’ to a ‘non-case’ (Case-NoCase). Conversely, a similar 20 percent of females who moved from being employed to being out of the labour force (EMP-OLF) went from being a ‘non-case’ to a ‘case’ (NoCase-Case). Almost a quarter of females (23 percent) who remained out of the labour-force, remained a ‘case’ (Case-Case). Only 9 percent of females who moved from being employed to being out of the labour-force (EMP-OLF) went from being a ‘case’ to a ‘non-case’.

Table 3.9 Distribution of transitions in caseness across broad labour-market transitions (Women)

Labour Market Transition	Caseness Transitions				
	NoCase_NoCase	Case_Case	NoCase_Case	Case_NoCase	Total
	obs / %	obs / %	obs /%	obs / %	obs / %
Emp_Emp	27,020	5,661	6,190	5,970	44,841
	60.26	***12.62***	***13.80***	***13.31***	***100***
Emp_Olf	1,844	768	723	468	3,803
	52.02	***18.36***	***20.17***	***9.46***	***100***
Olf_Emp	1,789	562	345	706	3,402
	52.59	***16.52***	***10.14***	***20.75***	***100***
Olf_Olf	9,317	4,261	2,310	2,466	18,354
	50.76	***23.22***	***12.59***	***13.44***	***100***
Total	39,970	11,252	9,568	9,610	70,400
	56.78	***15.98***	***13.59***	***13.65***	***100***

Pearson chi2(9) = 1.5e+03 Pr = 0.000
Cramér's V = 0.0840

Notes: The percentage reported in rows shows the proportion of observations per caseness transition that is associated with each of the labour-market transitions. The row total at the foot of the table show the distribution of observations present within each of the caseness transitions categories.
Source: BHPS 1991-2008

5.6.1 Intermediate labour-market transitions and transitions in caseness

As shown in Table 3.10, a total of 51,687 intermediate labour-market transitions are reported for men. Of these, 93 percent (48,191 observations) have remained employed for two or more consecutive years (EMP-EMP). More than 70 percent of those who have remained employed (EMP-EMP) have also remained 'non-cases' (NoCase-NoCase). 8 percent remained a 'case' (Case-Case) and 10 percent in each instance went from being a 'non-case' to a 'case' (NoCase-Case) or vice versa. A transition that would presumably be associated with a detrimental effect on mental well-being is moving from a state of employment to one of unemployment (EMP-UNEMP). Just over half (51 percent) of cases that are reported to have undergone such a transition remained a 'non-case' (NoCase-NoCase). However, almost a quarter (23 percent) of those males who moved from (EMP-UNEMP) also transitioned from being a 'non-case' to a 'case' (NoCase-Case). Conversely, for men who transitioned from being unemployed to employed (UNEMP-EMP), almost a quarter (24 percent) transitioned from being a 'case' to a 'non-case'. Approximately 30 percent of men who went from being 'employed' to 'long-term sickness' remained a 'non-case', while 32 percent remained a 'case' and just under 30 percent transitioned from being a 'non-case' to a 'case' (NoCase-Case). Over 70 percent of men who moved from employment into retirement (EMP-RETIRE) remained a 'non-case' (NoCase-NoCase), 12 percent remained a 'case'.

Table 3.10 Distribution of transitions in caseness across intermediate labour-market transitions (Men)

Labour Market Transition	Caseness Transitions				
	NoCase_NoCase	Case_Case	NoCase_Case	Case_NoCase	Total
	obs / %	obs / %	obs /%	obs / %	obs / %
Emp_Emp	34,256	3,971	5,071	4,893	48,191
	71.08	***8.24***	***10.52***	***10.15***	***100***
Emp_Unemp	597	202	273	100	1,172
	50.94	***17.24***	***23.29***	***8.53***	***100***
Unemp_Emp	722	190	99	319	1,330
	54.29	***14.29***	***7.44***	***23.98***	***100***
Emp_Retire	286	47	22	51	406
	70.44	***11.58***	***5.42***	***12.56***	***100***
Emp_FamCare	31	10	7	7	55
	56.36	***18.18***	***12.73***	***12.73***	***100***
FamCare-Emp	55	8	12	8	83
	66.27	***9.64***	***14.46***	***9.64***	***100***
Emp_Ltsick	92	96	88	25	301
	30.56	***31.89***	***29.24***	***8.31***	***100***
Ltsick_Emp	62	28	8	51	149
	41.61	***18.79***	***5.37***	***34.23***	***100***
Total	36,101	4,552	5,580	5,454	51,687
	69.85	***8.81***	***10.80***	***10.55***	***100***

Pearson chi2(21) = 1.2e+03 Pr = 0.000

Cramér's V = 0.0875

Notes: The percentage reported in rows shows the proportion of observations per caseness transition that is associated with each of the labour-market transitions.

Source: BHPS 1991-2008

With regards to the proportion of females who have undergone transitions in 'caseness' following labour-market transitions (Table 3.11). A total of 51,924 labour-market transitions are recorded for females, with 86 percent (44,841 observations) remaining employed for two or more consecutive years (EMP-EMP). Of this 86 percent, 60 percent remained a 'non-case' (NoCase-NoCase), and approximately 13 percent in each instance remained a 'case' (Case-Case); approximately 13 percent in each instance transitioned from being a 'non-case' to a 'case' (NoCase-Case) or went from being a 'case' to a 'non-case' (Case-NoCase).

A transition that would be expected to be associated with a negative (detrimental) effect on mental well-being is moving from employment to unemployment (EMP-UNEMP) (Thomas et al. 2005). 38 percent of females who underwent such a transition remained a 'non-case', 22 percent went from being a 'non-case' to a 'case' while a quarter (25 percent) remained a 'case' (Case-Case). For females who were employed and then moved into family-care roles (EMP-FMC) over half remained a 'non-case', however, almost 20 percent transitioned from being a 'non-case' to a 'case' (NoCase-Case), 15 percent remained a 'case', and 12 percent moved from being a 'case' to a 'non-case'. For females

who went from being in family-care roles to employment (FMC-EMP), 56 percent remained a 'non-case', and almost 19 percent changed from being a 'case' to a 'non-case' (Case-NoCase).

Of those females who transitioned from being employed into long-term sickness (EMP-LTS), 43 percent remained a 'case', 22 percent remained a non-case, and 28 percent changed from being a 'non-case' to a 'case' (NoCase-Case). The opposite transition (LTS-EMP) shows that less that one-third (32 percent) remained a 'non-case', 28 percent remained a 'case' and 34 percent transitioned from being a 'case' to a 'non-case' (Case-NoCase). Finally, for females who retired (from being employed) (EMP-RETIRE), over 60 percent remained a 'non-case', 14 percent remained a 'case', 13 percent changed from being a 'case' to a 'non-case' with the fewest (11 percent) transitioning from being a 'non-case' to a 'case' (NoCase-Case).

Table 3.11 Distribution of transitions in caseness across intermediate labour-market transitions (Women)

Labour Market Transition	Caseness Transitions				
	NoCase_NoCase	Case_Case	NoCase_Case	Case_NoCase	Total
	obs / %	obs / %	obs /%	obs / %	obs / %
Emp_Emp	27,020	5,661	6,190	5,970	44,841
	60.26	***12.62***	***13.80***	***13.31***	***100***
Emp_Unemp	295	198	170	114	777
	37.97	***25.48***	***21.88***	***14.67***	***100***
Unemp_Emp	370	158	76	197	801
	46.19	***19.73***	***9.49***	***24.59***	***100***
Emp_Retire	387	88	68	79	622
	62.22	***14.15***	***10.93***	***12.70***	***100***
Emp_FamCare	1,094	348	399	252	2,093
	52.27	***16.63***	***19.06***	***12.04***	***100***
FamCare-Emp	1,295	339	246	436	2,316
	55.92	***14.64***	***10.62***	***18.83***	***100***
Emp_Ltsick	68	134	86	23	311
	21.86	***43.09***	***27.65***	***7.40***	***100***
Ltsick_Emp	52	45	10	56	163
	31.90	***27.61***	***6.13***	***34.36***	***100***
Total	30,581	6,971	7,245	7,127	51,924
	58.90	***13.43***	***13.95***	***13.73***	***100***

Pearson chi2(21) = 923.9830 Pr = 0.000

Cramér's V = 0.0770

Notes: The percentage reported in rows shows the proportion of observations per caseness transition that is associated with each of the labour-market transitions.

Source: BHPS 1991-2008

Many of these transitions have been explored by Thomas et al. (2005), although they considered the first eight waves of the BHPS, this chapter has considered all available waves of the study (eighteen, from 1991 - 2008). In addition, Thomas et al. (2005) did not

consider (in any great detail) movements from employed to employed (EMP-EMP), or being out of the labour-force for two or more consecutive waves (OLF-OLF).

5.7 Analysis

In Table 3.12, the results from two multilevel logistic regressions with robust standard errors are considered where only intermediate transitions are included in the models. The male and female sample are considered separately and coefficients reported represent the log of the odds of being a case when all other covariates are held constant. The outcome is 'caseness' where a yes = 1 (reference category) indicates the presence of potential psychiatric morbidity. In Figure 2.8, the coefficients reported in Model 15 (male) and Model 16 (female) samples are plotted and directly compared.

Table 3.12 Multilevel logistic regression models with robust standard errors: Reporting log odds of being a 'case' and shows this effect in relation to intermediate labour-market transitions.

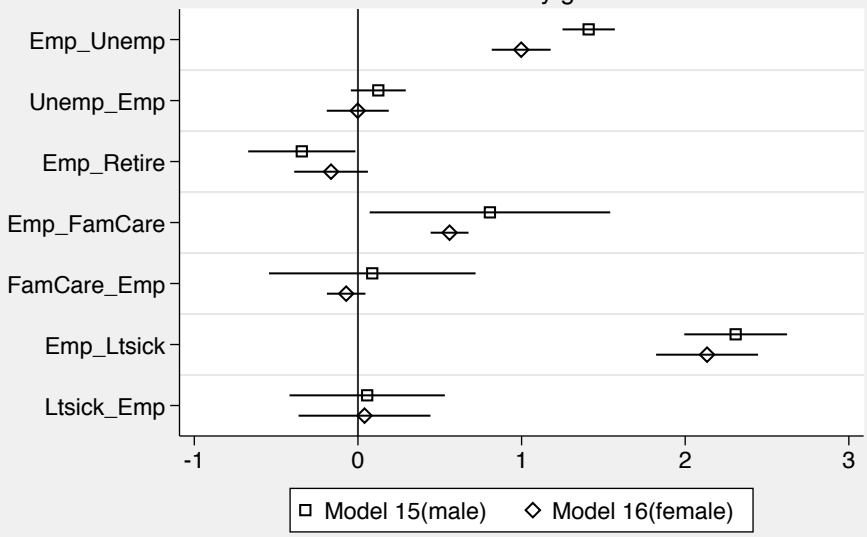
Caseness: (GHQ-12>3)	Model 15 (Male)			Model 16 (Female)		
Yes = 1	b	se	[95% CI]	b	se	[95% CI]
Emp_Emp ♀	0.00			0.00		
Emp_Unemp	1.41***	(0.08)	[1.24,1.58]	1.00***	(0.10)	[0.81,1.19]
Unemp_Emp	0.12	(0.09)	[-0.05,0.30]	-0.00	(0.10)	[-0.20,0.19]
Emp_Retire	-0.34*	(0.17)	[-0.68,-0.00]	-0.16	(0.12)	[-0.39,0.06]
Emp_FamCare	0.81*	(0.37)	[0.08,1.54]	0.56***	(0.06)	[0.44,0.68]
FamCare-Emp	0.09	(0.33)	[-0.56,0.73]	-0.07	(0.06)	[-0.19,0.05]
Emp_Ltsick	2.31***	(0.17)	[1.98,2.64]	2.13***	(0.16)	[1.82,2.45]
Ltsick_Emp	0.06	(0.25)	[-0.43,0.54]	0.04	(0.21)	[-0.37,0.45]
_cons	-2.05***	(0.03)	[-2.11,-1.99]	-1.37***	(0.02)	[-1.42,-1.32]
Logged var of random intercept	.94	(0.04)	[0.86,1.01]	.67	(0.04)	[0.60,0.74]
Residual Std.Dev of random intercept	1.6	(0.03)	[1.54,1.66]	1.4	(0.02)	[1.35,1.45]
rho	0.44			0.37		
N	51,687			51,924		
N_g	7,814			8,050		
log Likelihood	-22551.27			-27529.62		
bic	45200.22			55156.96		

Legend: p<0.05 * p<0.01** p<0.001 ***

♀ = ***Reference Category***

Source: BHPS 1991-2008

Figure 2.8 Caseness across intermediate labour-market transitions by gender



Source: BHPS 1991-2008

The results in Table 3.12 indicate that compared to those who remain employed for two consecutive waves of the survey, moving into unemployment from employment (EMP-UNEMP) increases the log of the odds of being a 'case' for men (beta = 1.41, p<0.001), and for females, this transition increases the log of the odds by (beta = 1.00, p<0.001). Moving into employment from unemployment (UNEMP-EMP) does not produce a significant effect on the log of the odds of being a case in either the male or female sample. For men who retire (EMP-RETIRE) the log of the odds of being a case is reduced by (beta -.34, p<0.05). This is the only transition in the male sample model that results in a negative (beneficial) effect on the likelihood of being a 'case' following a labour-market transition. Moving into retirement is not significant in the female model. As was outlined previously, very few men have transitioned either from or to family-care roles from or to employment.

The extremely wide confidence intervals that are reported in each of these transition categories (EMP-FMC and FMC-EMP) means that the results in the male sample model must be treated with caution. For men, moving into family-care from employment (EMP-FMC) increases the log of the odds of being a case (beta = .81, p<0.05, 95% ci .81-1.54]. The opposite transition, that is moving into employment from family-care roles does not significantly affect the likelihood of being a 'case' for men. A similar pattern emerges for females, although confidence intervals around these estimates are small, in comparison to

the male sample's results. Moving into family-care from employment increases the log of the odds of being a case for (beta = .56, p<0.001, 95% ci 0.44 - 0.68). The reverse transition is found not to elicit a statistically significant effect on the response however.

Transitioning from employment into long-term sickness (EMP-LTS) produces the largest positive effect on the log of the odds of being a 'case', for men this is (beta = 2.31, p<0.001, 95% ci 1.98 - 2.64) and for women (beta = 2.13, p<0.001, 95% ci 1.82 - 2.45). However, the opposite transition of moving into employment from long-term sickness does not result in a statistically significant effect on the log of the odds of being a case. The wide confidence intervals that surround the estimates concerning transitions into and out of long-term sickness suggest that within these categories, there are some people who indeed have poor mental well-being, or are at risk of being a 'case', however, there are also others who despite their 'sickness' status, are not a 'case'.

Comparing the intraclass correlation (ICC), also referred to as *rho*, across the male and female sample we find that for men (model 15), 44 percent of variation in the propensity (or log of the odds) of being a 'case' are due to differences at the group level (which in this instance is between individuals). 56 percent of the variation is explained by within-unit differences (within the same individual over time). For females, there is less variation in the odds of being a case explained at the group level (level 2 between individuals) (*rho* = .37), leaving 63 percent of the variation in propensity of being a 'case' explained by differences within the same individual female over time. These findings therefore indicate that in terms of being a 'case' or a 'non-case' over time, men experience more stability than their female counterparts. This is not entirely surprising since females are more likely than males to experience mental health problems and frequently report higher GHQ-12 scores than men (Piccinelli and Wilkinson, 2000).

5.7.1 All possible labour market transitions

In addition to examining broad transitions in labour-market status, below, all possible combinations of transitions are explored (see Table 3.13). There are 25 possible transitions,

with five within-state categories (remaining within a specific labour-market state for successive waves) and 20 transitions from one mode to another.

Table 3.13	All possible labour-market transitions by gender					
Employment Transition	**Male obs(%)**		**Female obs/%**		**Total obs/%**	
Emp-Emp	53,179	(81%)	47,583	(63%)	100,762	(71%)
Emp-Unemp	1,351	(2%)	849	(1%)	2,200	(1.5%)
Emp-Retired	441	(0.7%)	669	(0.9%)	1,110	(0.8%)
Emp-FamCare	61	(0.1%)	2,245	(3%)	2,306	(1.6%)
Emp-Lts	349	(0.5%)	350	(0.5%)	699	(0.5%)
Unemp-Unemp	1,878	(2.8%)	642	(0.8%)	2,520	(1.8%)
Unemp-Emp	1,531	(2.3%)	887	(1.2%)	2,418	(1.7%)
Unemp-Retired	118	(0.2%)	82	(0.1%)	200	(0.1%)
Unemp-FamCare	100	(0.1%)	556	(0.7%)	656	(0.5%)
Unemp-Lts	316	(0.5%)	178	(0.2%)	494	(0.3%)
Retired-Retired	1,833	(2.8%)	3,600	(4.7%)	5,433	(3.8%)
Retired-Emp	126	(0.2%)	130	(0.2%)	256	(0.2%)
Retired-Unemp	53	(0.08%)	20	(0.03%)	73	(0.05%)
Retired-FamCare	13	(0.02%)	353	(0.5%)	366	(0.3%)
Retired-Lts	212	(0.3%)	148	(0.2%)	360	(0.3%)
FamCare-FamCare	218	(0.3%)	9,587	(12.7%)	9,805	(7%)
FamCare-Emp	90	(0.1%)	2,453	(3.2%)	2,543	(1.8%)
FamCare-Unemp	92	(0.1%)	433	(0.6%)	525	(0.4%)
FamCare-Retired	21	(0.03%)	548	(0.7%)	569	(0.4%)
FamCare-Lts	15	(0.02%)	403	(0.5%)	418	(0.3%)
Lts-Lts	3,124	(4.8%)	2,665	(3.5%)	5,789	(4%)
Lts-Emp	167	(0.2%)	183	(0.2%)	350	(0.2%)
Lts-Unemp	195	(0.3%)	115	(0.1%)	310	(0.2%)
Lts-Retired	263	(0.4%)	301	(0.4%)	564	(0.4%)
Lts-FamCare	14	(0.02%)	306	(0.4%)	320	(0.2%)
Total	65,760		75,286		141,046	
Cramer's V = 0.34						
Chi2(24) - 1.7e+04 Pr = 0.000						
Source: BHPS 1991-2008						

While the majority of male and female respondents have remained employed from one wave to the next (EMP-EMP), more men (80%) than females (63%) have done so. Slightly fewer females than males (1 percent and 2 percent respectively) transition from employment into unemployment (EMP-UNEMP) while more females (3 percent) than males (0.1 percent) have moved from a state of employment into family care roles (EMP-FAMCARE). More within-state transitions in unemployment (UNEMP-UNEMP) are reported for males (2.8%) than are for females (0.8%), similarly, 2.3 percent of male transitions are recorded for moves from unemployment into employment (UNEMP-EMP) compared to 1.2 percent of females who undergo the same transition. More females remain in a state of retirement than males (4.7% and 2.8% respectively), while an identical proportion of male and female transitions are recorded from retirement into employment (RETIRED-EMP) (0.2 percent for both). Moving from retirement into unemployment is perhaps the least likely transition of all those reported in Table 3.13, accounting for 0.05

percent of transitions. As previously noted, females are more likely than males to be engaged in family care roles, remain in such roles, or transition into or from these roles than are men. This is reflected across each of the potential transitions within and from family care roles in the Table 3.13. Finally and with regards to transitions within and from 'long term sickness or disability', although slightly more males than females remain long-term sick in successive waves (4.8 percent and 3.5 percent), for all other possible transitions out of long term sickness (excluding those into family-care roles), there is much similarity in the transitions recorded for both male and female respondents.

In Table 3.14, the results from two logistic regression models are reported, Model 17 (men) and Model 18 (females). The dependent variable is the binary measure for 'caseness', where being a 'case' (1) is indicative of potential minor psychiatric morbidity. All of the potential labour-market transitions are compared against the reference category of remaining employed (EMP-EMP). In addition, a number of confounding variables are included in the models, controlling for age, educational attainment, marital status, subjective health status and income.

Compared to those who report being employed for successive waves (EMP-EMP), the most detrimental transition in terms of increasing the log of the odds of being a 'case' for both men and women, is moving from a state of employment into one of long term sickness (EMP-LTS). Indeed almost all transitions that involve moving into a state of 'long-term sickness' is associated with a statistically significant increase in the log odds of being a 'case'. For both men and women who transition from employment into unemployment (EMP-UNEMP), there is a statistically significant increase in the log of the odds of being a 'case' when compared to the reference category (EMP-EMP).

Table 3.14 Logistic Regression with Robust Standard Errors: Reporting Log Odds. Models estimate the log odds of being a case across all potential employment transitions by gender.

Y = Caseness (0 = no 1 =yes)	Model 17 (Males) b	se	[95% CI]	Model 18 (Females) b	se	[95% CI]
Emp-Emp ♀	0.00			0.00		
Emp-Unemp	1.39***	(0.08)	[1.22,1.55]	0.86***	(0.10)	[0.67,1.06]
Emp-Retired	-0.22	(0.17)	[-0.56,0.13]	-0.06	(0.12)	[-0.30,0.18]
Emp-FamCare	0.90*	(0.40)	[0.12,1.68]	0.52***	(0.06)	[0.39,0.64]
Emp-Lts	1.58***	(0.17)	[1.26,1.91]	1.30***	(0.16)	[0.99,1.60]
Unemp-Unemp	0.67***	(0.09)	[0.49,0.85]	0.53***	(0.13)	[0.29,0.78]
Unemp-Emp	0.13	(0.09)	[-0.05,0.31]	-0.02	(0.10)	[-0.22,0.17]
Unemp-Retired	0.12	(0.28)	[-0.43,0.67]	-0.56	(0.34)	[-1.22,0.10]
Unemp-FamCare	0.96***	(0.28)	[0.40,1.51]	0.46***	(0.12)	[0.23,0.69]
Unemp-Lts	1.42***	(0.17)	[1.08,1.77]	1.00***	(0.22)	[0.57,1.44]
Retired-Retired	-0.25*	(0.12)	[-0.48,-0.01]	0.03	(0.08)	[-0.12,0.18]
Retired-Emp	-1.04*	(0.47)	[-1.96,-0.13]	-0.13	(0.24)	[-0.60,0.34]
Retired-Unemp	0.50	(0.39)	[-0.26,1.25]	-0.18	(0.52)	[-1.19,0.83]
Retired-FamCare	0.79	(0.69)	[-0.55,2.14]	0.10	(0.16)	[-0.22,0.42]
Retired-Lts	0.62**	(0.23)	[0.16,1.07]	0.54*	(0.25)	[0.05,1.02]
FamCare-FamCare	0.41	(0.25)	[-0.09,0.91]	0.15***	(0.05)	[0.06,0.24]
FamCare-Emp	0.04	(0.32)	[-0.58,0.66]	-0.14*	(0.06)	[-0.26,-0.01]
FamCare-Unemp	1.32***	(0.35)	[0.64,2.01]	0.26	(0.14)	[-0.03,0.54]
FamCare-Retired	0.48	(0.73)	[-0.95,1.91]	0.00	(0.13)	[-0.26,0.26]
FamCare-Lts	1.51	(0.79)	[-0.04,3.05]	0.81***	(0.14)	[0.54,1.09]
Lts-Lts	1.07***	(0.10)	[0.88,1.26]	0.58***	(0.08)	[0.42,0.74]
Lts-Emp	-0.63*	(0.28)	[-1.17,-0.09]	-0.32	(0.22)	[-0.75,0.10]
Lts-Unemp	0.68**	(0.22)	[0.24,1.11]	0.52*	(0.25)	[0.03,1.01]
Lts-Retired	0.70**	(0.22)	[0.27,1.12]	0.32	(0.17)	[-0.01,0.65]
Lts-FamCare	-0.00	(0.72)	[-1.41,1.40]	0.52**	(0.17)	[0.19,0.84]
Age (18-64)	0.08***	(0.01)	[0.06,0.10]	0.04***	(0.01)	[0.01,0.06]
Age2 (Quadratic)	-0.00***	(0.00)	[-0.00,-0.00]	-0.00***	(0.00)	[-0.00,-0.00]
Degree / Post Graduate	0.40***	(0.07)	[0.27,0.53]	0.08	(0.05)	[-0.03,0.19]
Diploma / Vocational	0.08	(0.05)	[-0.02,0.19]	-0.04	(0.04)	[-0.13,0.04]
High School Quals ♀	0.00			0.00		
Low / No Quals	-0.11	(0.07)	[-0.24,0.02]	-0.03	(0.05)	[-0.13,0.07]
Married ♀	0.00			0.00		
Couple	-0.04	(0.06)	[-0.15,0.08]	0.06	(0.05)	[-0.04,0.15]
Widowed	0.66**	(0.21)	[0.25,1.07]	0.72***	(0.10)	[0.53,0.92]
Divorced / Separated	0.51***	(0.08)	[0.35,0.67]	0.44***	(0.05)	[0.34,0.54]
Never Married	0.05	(0.06)	[-0.07,0.17]	0.08	(0.06)	[-0.03,0.19]
Excellent Health	-0.45***	(0.04)	[-0.53,-0.38]	-0.52***	(0.03)	[-0.59,-0.45]
Good Health ♀	0.00			0.00		
Fair Health	0.78***	(0.04)	[0.70,0.85]	0.79***	(0.03)	[0.73,0.85]
Poor / Very Poor Health	1.91***	(0.06)	[1.79,2.03]	1.79***	(0.05)	[1.70,1.88]
H/hold equivalence scale after housing costs: Quantiles						
1st Quantile ♀	**0.00**			**0.00**		
2nd Quantile	0.04	(0.04)	[-0.05,0.12]	0.02	(0.03)	[-0.04,0.09]
3rd Quantile	0.05	(0.05)	[-0.05,0.14]	0.04	(0.04)	[-0.04,0.12]
_constant	-3.48***	(0.26)	[-3.99,-2.96]	-1.98***	(0.21)	[-2.40,-1.56]
lnsig2u						
_constant	0.83***	(0.04)	[0.76,0.90]	0.58***	(0.03)	[0.51,0.64]
N	57869			68304		
N_g	8910			9990		
rho	0.41			0.35		

Legend: p<0.05 * p<0.01** p<0.001 ***

♀ = Reference Category

Source: BHPS 1991-2008

There are differences in terms of the impact that labour-market transitions have on the log of the odds of being a case between the genders. This is true for transitions to and from 'family-care' roles for example, and retirement. However, in both instances these categories are overrepresented by female respondents and so making conclusions based on this data alone is not possible. We would require more data on men who transition to and from family roles and indeed more who have transitioned into retirement. However, from these two models we can see that remaining employed for successive waves or transitioning into employment from other labour-market positions is the most beneficial for mental health in terms of the odds of being a case.

5.8 Summary

Using longitudinal data from the British Household Panel Study, clear patterns and relationships are established between the experience of labour market transitions and psychiatric morbidity (measured using the General Health Questionnaire). People who experience stability over time, particularly stability in favourable employment circumstances, benefit from more favourable psychiatric morbidity. The relationship with transitions in circumstances is found to be asymmetric; the relative benefits of moving into employment are not as substantial as the relative costs of moving out of employment in terms of psychiatric morbidity outcomes. The most detrimental effect on mental health however, is the transition from employment to long-term sickness.

Chapter 6 - Occupation and Mental Health: Gender Disparities

6. Introduction

This chapter will consider the relationship between occupation and mental well-being and more precisely, identify specific occupations that have an increased and decreased prevalence of common mental disorder. There is much evidence to suggest that levels of mental health (and prevalence of mental disorder) vary by occupation (Stansfeld et al. 2011; 2012). Studies have shown that many people who work in sales, personal and protective services, teachers, clerical workers, welfare workers and kitchen and waiting staff for example, have an increased risk of psychiatric morbidity than are people who are work in craft and 'other' professional occupations, plant and machine operatives and those in various skilled occupations (Stansfeld et al. 2011: 101). There are several potential explanations as to why some occupations seem to be associated with a greater risk of psychiatric morbidity than others. We might consider rates of pay, number of hours normally worked and type of contract people have for example. However, such objective measures, while important, do not on their own explain why some people in certain occupations are at greater risk of mental disorder than others. In attempts to explore other potential factors that may account for this disparity in psychiatric morbidity between occupations, many researchers have considered the role that the psychosocial work environment has on mental health outcomes (Stansfeld et al. 2006).

Several models have been developed which can help researchers explore the associations between the psychosocial work environment and mental health. The most widely used being the Job Demand-Control model (JDC) (Karasek, 1979); the Job Demand-Control-Support model (JDCS) (Johnson and Hall 1988; Karasek and Theorell, 1990); and Effort-Reward-Imbalance model (ERI) (Siegrist, 1996). These models have been used to explore whether psychosocial differences in occupations, including job demands, level of control, rewards and fulfilment, and levels of support for example, have any bearing over the prevalence of psychiatric morbidity within occupations. Stansfeld et al. (2006) conducted a meta-analytic review of eleven longitudinal studies that explored these relationships and found that job strain, low decision latitude (control over ones day), low social support, high

psychological demands, effort-reward imbalance and job insecurity (in combinations), predicted common mental disorders (Stansfeld et al. 2006: 443). In another study, Stansfeld et al. (2012) investigated the prevalence of common mental disorders across occupations, and considered whether adverse working conditions could explain the increased/decreased risk of common mental disorders for occupational groups using the Effort-Reward-Imbalance (ERI) model.

6.1 Research questions to be addressed

1. Identify occupations that are associated increased and decreased risk of psychiatric morbidity and explore these patterns by gender.
2. Examine the relationship between mental well-being and occupation across different types of occupational classification schemes.

6.2 Distribution of 'caseness' across sub-major SOC 2000 groups

Tables 4, 4.1 and 4.2 shows the distribution of cases across each of the sub-major SOC 2000 categories for the entire sample, for men, and women respectively. In each instance, the SOC group with largest number of cases are shown first where total observations and related percentages are displayed in the first column. In the second column, the number of cases that record a CIS-R score of 12 or more are identified, with the proportion of such cases being shown as a percentage and confidence intervals shown in the third column. After discussing the distribution of cases across SOC 2000 groups we will consider the prevalence of common mental disorder across these occupational categories and focus predominantly on those SOC groups for which there are (or close to) 100 observations recorded for both men and women.

As can be seen in Table 4, corporate managers represent the largest SOC group, making up 13% of the entire sample. This is also true for the male sample where 16% (the largest SOC group by some margin) report being corporate managers. For females, caring and personal service occupations and administrative occupations, each have 12% of total observations and are the largest SOC groups, although a comparable 11 percent of females

report being corporate managers. The gendered nature of many occupations are obvious from these tables, where men are more likely to be employed in trades, skilled or otherwise, such as metal and electrical trades (8%); construction and building (8%) and transport and machine drivers (7%) for example. When we consider the same figures for females who work in these occupations we see that only 1 percent (12 observations) are recorded for transport and machine drivers with only two and one observation recorded in construction/building and metal/electrical trades respectively. Similarly, while the largest percentage of females are engaged in caring personal service occupations (12%), only 2 percent of males are present in the same category. The same is true for health and social welfare occupations, where 9 percent of female observations are reported here, only 2 percent of males report being in the same category.

Table 4. Entire Sample Prevalence of CMD (cis-r >=12) across sub-major SOC 2000 groups

Sub-major SOC 2000 groups	Obs (%)	Obs (%)	[95% CI]
11. Corporate managers	**473 (13%)**	**49 (9%)**	**[7-12]**
41. Administrative occupations	**286 (8%)**	**43 (14%)**	**[10-18]**
61. Caring personal service occupations	**253 (7%)**	**53 (20%)**	**[15-24]**
92. Elementary admin and service workers	**251 (7%)**	**49 (19%)**	**[14-23]**
35. Business and public service assoc profs	**225 (6%)**	**26 (11%)**	**[7-15]**
23. Teaching and research professionals	**207 (6%)**	**27 (13%)**	**[8-17]**
32. Health and social welfare assoc profs	**189 (5%)**	**28 (15%)**	**[10-20]**
71. Sales occupations	**167 (5%)**	**29 (17%)**	**[11-22]**
52. Skilled metal and electrical trades	131 (4%)	9 (7%)	[3-12]
82. Transport and mobile machine drivers	129 (4%)	8 (6%)	[3-11]
21. Science and technology professionals	128 (4%)	11 (9%)	[3-14]
81. Process, plant and machine operatives	123 (3%)	16 (10%)	[4-15]
53. Skilled construction and building trades	119 (3%)	14 (12%)	[6-18]
24. Business and public service professionals	114 (3%)	11 (7%)	[2-12]
42. Secretarial and related occupations	111 (3%)	14 (12%)	[6-18]
12. Managers and proprietors in agriculture	108 (3%)	10 (6%)	[2-11]
54. Textiles, printing and other skilled trades	88 (2%)	10 (10%)	[3-16]
91. Elementary trades, plant and storage workers	80 (2%)	6 (6%)	[0.4-11]
34. Culture, media and sports occupations	77 (2%)	10 (14%)	[6-22]
62. Leisure and other personal services	64 (2%)	11 (17%)	[7-26]
31. Science and tech' associate professionals	51 (1%)	8 (14%)	[4-24]
33. Protective service occupations	50 (1%)	9 (16%)	[6-27]
72. Customer service occupations	43 (1%)	7 (17%)	[5-28]
51. Skilled agricultural trades	40 (1%)	4 (8%)	[-0.7-17]
22. Health professionals	33 (1%)	4 (13%)	[1-25]
Total	3450 100	466 (12%)	[11-13]

Source: Adult Psychiatric Morbidity Survey (2007)

Administrative occupations are also gendered, with 12 percent of females compared to 4 percent of males being present in this category. However, there are also similarities across some occupational groups; 6 percent of male and female respondents are business and public service associate professionals for example and 4% and 3% of males and females

respectively report being managers and proprietors in agriculture. In general though, it seems clear that men and women are employed in different types of jobs and sectors and as such, lends support to the decision to analyse relationships between occupation and mental health separately for men and women.

6.3 Prevalence of common mental disorder across sub-major SOC groups

Prevalence of common mental disorder across occupational groups is now considered, where a score of 12 or more on the CIS-R is understood to be indicative of potential psychiatric morbidity (Hankins, 2008). Both number of observations and related percentage of those within each SOC group are reported alongside 95% confidence intervals. It is clear that due to a lack of observations in certain occupational groups it is not possible to make claims about the effect that some occupations have on mental health outcomes. For this reason, the main focus of discussion and subsequent analyses will be reserved for the SOC groups for which we have at least 100 (or as close to 100) observations recorded for both the male and female sample. The overall prevalence of common mental disorder across the entire sample (Table 4) is 12 percent (95% CI 11-13), and ranges from a high of 20 percent (95% CI 15-24) (for caring and personal service occupations) to a low of 6 percent (for transport and mobile machine drivers (95% CI 3-11); managers and proprietors in agriculture (95% CI 2-11); and elementary trades, plant and storage workers (95% CI 0.4-11). It is clear from Table 4. that more than double the percentage of workers in caring and personal service occupations have potential psychiatric morbidity (20 percent, 95% CI 15-24) when compared to corporate managers who have a 9 percent prevalence (95% CI 7-12). However, as outlined above, females are overrepresented in caring and personal service occupations while men are overrepresented in two of the lowest prevalence groups (transport and mobile machine drivers, and elementary trades, plant and storage workers). With reference to the largest SOC groups (in bold type), only corporate managers, and business and public service associate professionals have below average (less than 12%) prevalence of CMD, while all others exceed this level. Caring roles and elementary administration workers record the highest percentage of workers in these occupations with a CIS-R score of 12 or more.

We must be careful when interpreting these above results since many of the confidence intervals are wide. Of the entire sample, only 'transport and machine operatives', 'managers and proprietors in agriculture', and 'elementary trades, plant and storage workers' have confidence intervals that remain below the overall average for prevalence of CMD (which is 12 percent). This suggests that across most occupational groups, CISR scores are spread out where some employees within what might be considered 'high-risk' occupations actually have good (or positive) mental health, and alternatively, some employees in 'low-risk' occupations might have poor mental health and well-being. These results mirror Stansfeld et al. (2011), where those in sales, personal and protective staff and clerical and admin staff for example had the highest prevalence for common mental disorders (pg. 103). Those in professional occupations, plant and machine operatives and craft and 'related' occupations (as measured using SOC 1990 codes) had the lowest prevalence rates and indeed odds of having a common mental disorder (measured using the CIS-R) (pg. 103).

6.3.1 Prevalence of common mental disorder across sub-major SOC groups by gender

When we consider the male (Table 4.1) and female (Table 4.2) samples separately it is clear that overall a larger proportion of females have potential psychiatric morbidity (16 percent) (95% CI 15-18) than males (9 percent) (95% CI 7-10). Starting first with the male sample (Table 4.1) and focussing only on those SOC groups where there are more than (or close to) 100 observations (in bold type); prevalence ranges from a low of 5 percent (95% CI 1-9), reported for transport and mobile machine drivers, to a high of 14 percent (95% CI 7-21) for elementary administration and service workers.

Three of the SOC groups (science and technology professionals; skilled construction and building trades; and elementary administrative and service workers) record an above average proportion of males with potential psychiatric morbidity. The remaining five SOC groups are below the 9 percent average where corporate managers; skilled metal and electrical trades; and business and public service associate professionals each record 7 percent prevalence of potential common mental disorder. If we consider the confidence

intervals however, and identify occupations where the 95% CI's do not reach or exceed the average prevalence rate (9 percent, 95% CI 7-10), only 'transport and machine operatives' (95% CI -1-9); 'elementary trades' (95% CI -1-9) and 'managers and proprietors in agriculture' meet such criteria.

For females (Table 4.2), prevalence of psychiatric morbidity ranges from a low of 12 percent (95% CI 6-18) for secretarial and related occupations, to a high of 23 percent (95% CI 16-29) for elementary administration and service workers. For those females who are in caring personal service occupations and elementary administration and service workers, they have by far the most percentage of females who record a CIS-R score of 12 or more. (21 percent, 95% CI 16-26, and 23 percent, 95% CI 16-29 respectively). From the confidence intervals we can see that a similar proportion of female employees have a CISR score of 12 or more, and in each instance, confidence intervals start at the average 16 percent and increase. For females, 'secretarial and related occupations' have the lowest prevalence rates (12 percent, 95% CI 6-18).

Table 4.1 Male Sample Prevalence of CMD (cis-r >=12) across sub-major SOC 2000 groups

Sub-major SOC 2000 groups	Obs (%)	Obs (%)	[95% CI]
11. Corporate managers	***278 (16%)***	***23 (7%)***	***[4-10]***
52. Skilled metal and electrical trades	***130 (8%)***	***9 (7%)***	***[3-12]***
53. Skilled construction and building trades	***17 (7%)***	***14 (12%)***	***[6-18]***
82. Transport and mobile machine drivers	***117 (7%)***	***6 (5%)***	***[1-9]***
35. Business and public service assoc profs	***110 (6%)***	***7 (7%)***	***[2-12]***
21. Science and tech professionals	***106 (6%)***	***10 (10%)***	***[4-16]***
81. Process, plant and machine operatives	***92 (5%)***	***11 (8%)***	***[3-14]***
92. Elementary admin and service workers	***92 (5%)***	***13 (14%)***	***[7-21]***
41. Administrative occupations	76 (4%)	11 (13%)	[6-21]
23. Teaching and research professionals	67 (4%)	4 (7%)	[1-13]
24. Business and public service professionals	66 (4%)	5 (7%)	[1-13]
91. Elementary trades, plant and storage workers	63 (4%)	3 (4%)	[-1-9]
12. Managers and proprietors in agriculture	61 (4%)	3 (4%)	[-1-9]
54. Textiles, printing and other skilled trades	58 (3%)	3 (5%)	[-0.1-10]
34. Culture, media and sports occupations	39 (2%)	5 (13%)	[2-24]
71. Sales occupations	39 (2%)	6 (14%)	[3-25]
33. Protective service occupations	36 (2%)	4 (12%)	[1-23]
31. Science and tech assoc professionals	35 (2%)	4 (7%)	[-2-16]
51. Skilled agricultural trades	32 (2%)	2 (4%)	[-3-12]
32. Health and social welfare assoc profs	29 (2%)	3 (12%)	[-0.6-24]
61. Caring personal service occupations	27 (2%)	4 (14%)	[-0.1-28]
62. Leisure and other personal services	21 (1%)	3 (9%)	[1-37]
22. Health professionals	19 (1%)	3 (18%)	[-0.1-36]
72. Customer service occupations	9 (0.5%)	1 (12%)	[-15-38]
42. Secretarial and related occupations	2 (0.1%)	0	
Total	1,721	157 (9%)	[7-10]

Note: Categories in bold represent SOC groups with approx. 100 or more observations
Source: Adult Psychiatric Morbidity Survey (2007)

Table 4.2 Female Sample	Prevalence of CMD (cis-r>=12) across sub-major SOC 2000 groups		
Sub-major SOC 2000 groups	Obs (%)	Obs (%)	[95% CI]
61. Caring personal service occupations	***226 (12%)***	***49 (21%)***	***[16-26]***
41. Administrative occupations	***210 (12%)***	***32 (15%)***	***[10-19]***
11. Corporate managers	***195 (11%)***	***26 (13%)***	***[8-17]***
32. Health and social welfare assoc profs	***160 (9%)***	***25 (15%)***	***[10-21]***
92. Elementary admin and service workers	***159 (9%)***	***36 (23%)***	***[16-29]***
23. Teaching and research professionals	***140 (8%)***	***23 (16%)***	***[10-23]***
71. Sales occupations	***128 (7%)***	***23 (18%)***	***[11-25]***
35. Business and public service assoc profs	***115 (6%)***	***19 (16%)***	***[9-22]***
42. Secretarial and related occupations	***109 (6%)***	***14 (12%)***	***[6-18]***
24. Business and public service professionals	48 (3%)	6 (8%)	[-1-16]
12. Managers and proprietors in agriculture	47 (3%)	7 (10%)	[1-19]
62. Leisure and other personal services	43 (2%)	8 (15%)	[4-27]
34. Culture, media and sports occupations	38 (2%)	5 (15%)	[3-27]
72. Customer service occupations	34 (2%)	6 (19%)	[5-33]
81. Process, plant and machine operatives	31 (2%)	5 (15%)	[2-28]
54. Textiles, printing and other skilled trades	30 (2%)	7 (24%)	[8-41]
21. Science and technology professionals	22 (1%)	1 (2%)	[-4-8]
91. Elementary trades, plant and storage workers	17 (1%)	3 (15%)	[-4-33]
31. Science and technology assoc profs	16 (1%)	4 (31%)	[6-57]
22. Health professionals	14 (1%)	1 (5%)	[-8-17]
33. Protective service occupations	14 (1%)	5 (31%)	[4-59]
82. Transport and mobile machine drivers	12 (1%)	2 (22%)	[-5-50]
51. Skilled agricultural trades	8 (0.5%)	2 (30%)	[-11-71]
53. Skilled construction and building trades	2 (0.1%)	0	
52. Skilled metal and electrical trades	1 (0.1%)	0	
Total	1,819	309 (16%) [15-18]	

Note: Categories in bold represent SOC groups with 100 or more observations
Source: Adult Psychiatric Morbidity Survey (2007)

From these aforementioned tables it is clear that a higher proportion of females have a CIS-R score that exceeds the threshold beyond which common mental disorder is (potentially) present. Due to the gendered nature of some occupational groups and the lack of observations recorded across others, it is not always possible to make meaningful comparisons between men and women across all SOC groups. However where such comparisons are possible, for example between male and female corporate managers and male and female elementary administrators and service workers, there is arguably much similarity. Corporate managers record the second lowest proportion of males with CIS-R (>=12) and so too do female corporate managers have the second lowest prevalence of common mental disorder, scoring 2 percent (males) and 3 percent (females) below their respective overall prevalence. However, the confidence intervals for female corporate managers (95% CI 8-17) are wider than they are for male corporate managers (95% CI 4-10), suggesting that there is a larger spread of CIS-R scores in the former group than in the latter. Of all the SOC groups with close to 100 observations, male and female elementary administrators and service workers record the highest prevalence of common

mental disorder with 14% of males (95% CI 7-21) and 23 percent of females (95% CI 16-29).

6.4 Risk of common mental disorder across major SOC group by gender

As some of the sub-major SOC groups have relatively few observations, it is not possible to make substantive claims regarding the prevalence of common mental disorder across all occupations or make claims about the wider population for example. The gendered nature of some occupations also prevent comparisons between males and females mental health and/or prevalence of psychiatric morbidity across all of the sub-major SOC groups. For these reasons and to offer more insight into the relationship between occupation and prevalence of psychiatric morbidity across a wider range of occupations, major SOC 2000 groups are considered hereafter. Major SOC groups consist of 9 categories and are comprised of the 25 sub-major SOC groups already outlined above. In Table 4.3, the prevalence of common mental disorder across major SOC groups are shown as a percentage with 95% confidence intervals.

Table 4.3 Entire Sample Prevalence of CMD (cis-r>=12) across major SOC 2000 groups

Major SOC 2000 groups	Obs (%)	Obs (%)	[95% CI]
1. Managers and senior officials	579 (16%)	51 (9%)	[6-11]
2. Professional occupations	478 (14%)	50 (10%)	[7-13]
3. Associate professional and tech occupations	588 (17%)	77 (13%)	[10-16]
4. Administrative and secretarial occupations	394 (11%)	54 (14%)	[10-17]
5. Skilled trades occupations	375 (11%)	36 (10%)	[6-12]
6. Personal service occupations	314 (9%)	60 (19%)	[14-23]
7. Sales and customer service occupations	207 (6%)	34 (16%)	[11-21]
8. Process, plant and machine operatives	251 (7%)	20 (8%)	[5-11]
9. Elementary occupations	330 (9%)	52 (16%)	[12-20]
Total	3,516	434 (12%)	

Source: APMS 2007

6.4.1 Identifying occupations with increased and decreased risk of common mental disorder

In this analysis, only individuals who are employed for two or more waves of the survey will be considered. In the first instance, occupations with an increased and decreased risk

of common mental disorder (as measured using both the continuous and binary versions of the GHQ-12) will be identified. The results from four regression models for use with panel data with robust standard errors are shown in Table 6 (linear regression) and Table 7 (logistic regression). In each instance, the dependent variable measures mental well-being where the former uses the Likert version of the GHQ-12 and the latter utilises the binary measure (caseness version) of the GHQ-12. Men and women are considered separately. Age (and its quadratic function), health status and financial situation are all included as explanatory variables. Unlike previous models, educational attainment, marital status and income are not included as covariates. A measure for subjective satisfaction with ones job (job-satisfaction) is included in the subsequent regression models, where a likert-scale ranging from 1 (completely satisfied) through 8 (completely dissatisfied) measures level of job satisfaction. Financial situation is also controlled for; people reporting that they are 'financially, doing OK' serve as the reference category. Finally, the major SOC 1990 groups are included as binaries where 'managers and administrators' are the reference category (on the basis that they record the most number of observations for both men and women across all SOC groups).

Table 4.4 shows the results of a random effects linear regression model for men (Model 9) and women (Model 10) separately. The outcome is the GHQ-12 Likert measure where higher scores are indicative of poor psychological well-being. A coefficient plot shows the results from the two models graphically (Figure 3) and where confidence intervals cross zero, such explanatory variables are considered to be non-significant. As we have seen in previous regression models, as people get older, the risk of psychiatric morbidity increases, however, around late 40's to mid-50's mental well-being improves, and thus the risk of psychiatric morbidity decreases. Health status remains an important predictor of psychological well-being, where compared to being in 'good health', reporting 'poor/very poor health' results in a 3.15 increase in the GHQ-12 coefficient for males (significant at $p<0.001$) and for females (beta = 3.73, $p<0.001$). Of all of the explanatory variables, being in poor health (controlling for all other measures) elicits the largest positive effect on the outcome. When we consider the effect that subjective financial situation has on well-being, a similar to that of health status emerges. The reference category is being 'financially OK', for those who are 'comfortable', a negative effect on the dependent variable is reported

(beta = -0.29, p<0.001) for the male sample and for females (beta = -0.45, p<0.001). Conversely, reporting being in 'financial difficulty' elicits a positive effect on GHQ-12 scores, beta = 2.59, p<0.001 and beta = 3.15, p<0.001 for men and women respectively.

When we consider the difference in GHQ-12 scores by major SOC 1990 groups, and with regards to the male sample first (Model 9), we find that compared to 'managers and administrators' (which represents the reference category), there is no statistically significant difference in GHQ-12 scores for those men employed within 'professional' or 'associate professional and technical' occupations. However, for all other major SOC groups, statistical significance is reported, and in each instance a reduction in the GHQ-12 coefficient is found. 'Plant and machine operatives' elicit the largest negative effect, (beta = -0.63, p<0.001) suggesting that men engaged in such occupations have better (more healthier) mental well-being than are those in the reference category. 'Craft and related occupations' also show a significant and negative impact on GHQ-12 scores (beta = -0.53, p<0.001). Of all the major SOC groups, 'personal and protective services' and 'sales' related occupations elicit the smallest negative, although still statistically significant, effect on the dependent variable (beta = -0.29, p<0.05 and beta = -0.31, p<0.05) respectively.

With regards to the female sample (Model 10), compared to the reference category (managers and administrators), all other major SOC groups show a negative impact on GHQ-12 scores. This suggests that females in the reference category have poorer mental well-being than those in alternative SOC groups. The only two SOC group that are not statistically significant relates to 'professionals' and those in 'craft and related occupations'. The largest negative effect on the outcome is recorded for females who are 'plant and machine operatives' (beta = -0.63, p<0.001). 'Personal and protective service occupations' elicit the second largest negative effect on GHQ-12 scores (beta = -0.29, p<0.01) while 'clerical and secretarial occupations show the lowest (significant) effect on the dependent variable, (beta = -0.24, p<0.05). Unlike what was observed in the male sample, there is a statistically significant effect for females who are in 'associate professional and technical occupations' (beta = -0.26, p<0.05).

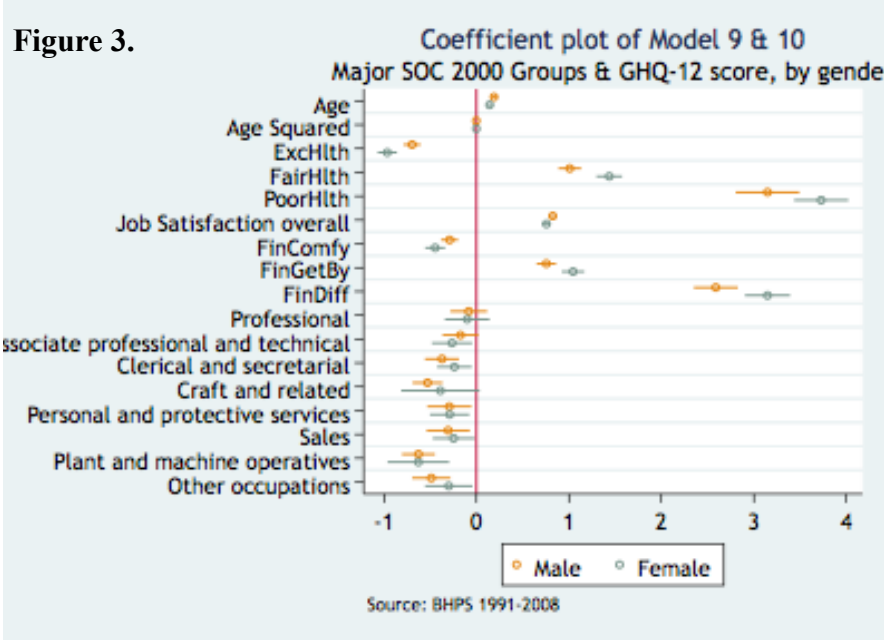
Broadly speaking, and clearly illustrated in Figure 3, there is much similarity in terms of the effect that major SOC groups have on GHQ-12 scores for both men and women. However, the gendered nature of some of the occupational groups, most notably 'craft and related occupations' and 'plant and machine operatives' is evinced through the wide confidence intervals reported for females in these categories. The important role that financial situation has on mental well-being is also evident from both Table 4.4 and Figure 3, where 'financial difficulty' is almost as detrimental for mental well-being as is being in 'poor/very poor health'.

Table 4.4. Linear regression models with random effects and robust standard errors: GHQ-12 scores across major SOC 2000 groups by gender

	Model 9 (Males)			Model 10 (Females)		
GHQ-12 score (0-36)	b	se	[95% CI]	b	se	[95% CI]
Age	0.19***	(0.02)	[0.16,0.22]	0.14***	(0.02)	[0.11,0.18]
Age2 (Quadratic)	-0.00***	(0.00)	[-0.00,-0.00]	-0.00***	(0.00)	[-0.00,-0.00]
Excellent Health	-0.70***	(0.05)	[-0.79,-0.60]	-0.96***	(0.05)	[-1.07,-0.86]
Good Health ♀	0.00			0.00		
Fair Health	1.01***	(0.06)	[0.89,1.13]	1.44***	(0.07)	[1.30,1.58]
Poor/Very Poor Health	3.15***	(0.18)	[2.80,3.49]	3.73***	(0.15)	[3.44,4.02]
Overall Job Satisfaction	0.83***	(0.02)	[0.78,0.87]	0.76***	(0.02)	[0.71,0.80]
Fin Sit: Comfortable	-0.29***	(0.05)	[-0.38,-0.20]	-0.45***	(0.05)	[-0.55,-0.34]
Fin Sit: OK ♀	0.00			0.00		
Fin Sit: Getting-by	0.76***	(0.05)	[0.65,0.86]	1.05***	(0.06)	[0.92,1.17]
Fin Sit: Difficult	2.59***	(0.12)	[2.35,2.83]	3.15***	(0.12)	[2.90,3.39]
Managers & Administrators ♀	0.00			0.00		
Professional	-0.08	(0.10)	[-0.28,0.12]	-0.10	(0.12)	[-0.34,0.14]
Associate Prof & Technical	-0.17	(0.10)	[-0.37,0.02]	-0.26*	(0.11)	[-0.48,-0.05]
Clerical & Secretarial Occs	-0.37***	(0.09)	[-0.56,-0.19]	-0.24*	(0.10)	[-0.42,-0.05]
Craft & Related Occs	-0.53***	(0.08)	[-0.69,-0.37]	-0.39	(0.22)	[-0.81,0.03]
Personal & protective serv.	-0.29*	(0.12)	[-0.53,-0.05]	-0.29**	(0.11)	[-0.50,-0.08]
Sales	-0.31*	(0.12)	[-0.54,-0.07]	-0.25*	(0.11)	[-0.47,-0.02]
Plant & Machine Operatives	-0.63***	(0.09)	[-0.81,-0.45]	-0.63***	(0.17)	[-0.96,-0.29]
Other occupations	-0.49***	(0.11)	[-0.69,-0.28]	-0.30*	(0.13)	[-0.56,-0.04]
_constant	3.81***	(0.30)	[3.22,4.41]	6.07***	(0.35)	[5.38,6.76]
N	44478			46858		
N_g	7626			7996		
chi2	3593.81			3767.32		
rho	0.33			0.29		

Legend: p<0.05 * p<0.01** p<0.001 ***
♀ = Reference Category
Source: BHPS 1991-2008

Figure 3.



6.4.2 Prevalence of psychiatric morbidity across major SOC groups by gender

In Table 4.5, the results from two logistic regression models are reported; Model 11 (male sample) and Model 12 (female sample). As has been used previously, the binary version of the GHQ-12 serves as the dependent variable where a 1 = potential psychiatric morbidity and 0 = no psychiatric morbidity. From this perspective, what is being considered is the effect that the selected explanatory measures have on the log of the odds of an individual being a 'case' (experiencing psychiatric morbidity). All of the explanatory measures that featured in the previous models are utilised. As might be expected, the results from Models 11 & 12 (Table 4.5) are broadly the same as those reported in the previous models (Models 9 & 10). However, there is more similarity across gender especially where health status and financial situation binaries are concerned. For example, 'financially getting-by' when compared to the reference category (financially OK) has the exact same impact on the log of the odds of being a case for both men and women (beta = 0.50, $p<0.001$ in each instance). Similarly, reporting being in 'financial difficulty' also increases the log of the odds of being a case for men and women by the same amount (beta = 1.43, $p<0.001$ for both).

Focussing on the major SOC groups, again the results in Table 4.5 mirror to a large extent those which were reported in Table 4.4. 'Plant and machine operatives' and 'managers and

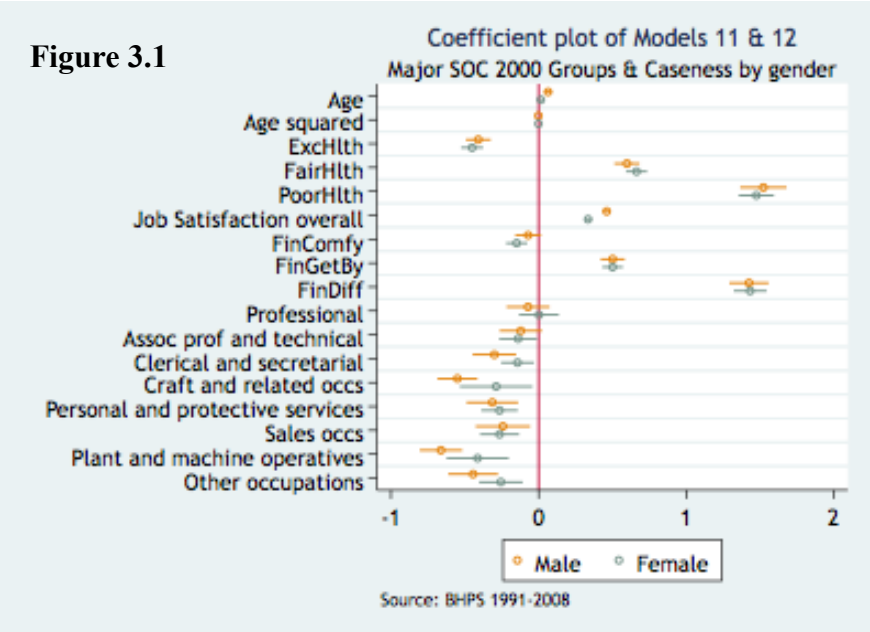
administrators' report the largest reduction in the log of the odds of being a case; beta = -0.66, p<0.001 for males and beta = -0.41, p<0.001 for females. Men in 'sales' occupations also have a decreased risk of common mental disorder when compared to the reference group, however at beta = -0.24, p<0.05, this represents the smallest reduction in the log of the odds across all SOC groups (excluding those that are not statistically significant).

Table 4.5. Logistic regression models with robust standard errors: Caseness across Major SOC 2000 groups by gender

	Model 11 (Males)			Model 12 (Females)		
Caseness: (no =0 yes =1)	b	se	[95% CI]	b	se	[95% CI]
Age	0.06***	(0.01)	[0.04,0.09]	0.02	(0.01)	[-0.01,0.04]
Age2 (Quadratic)	-0.00***	(0.00)	[-0.00,0.00]	-0.00	(0.00)	[-0.00,0.00]
Excellent Health	-0.41***	(0.04)	[-0.49,-0.32]	-0.45***	(0.04)	[-0.52,-0.38]
Good Health ♀	0.00			0.00		
Fair Health	0.60***	(0.04)	[0.51,0.68]	0.66***	(0.04)	[0.59,0.74]
Poor/Very Poor Health	1.52***	(0.08)	[1.37,1.68]	1.47***	(0.06)	[1.36,1.59]
Overall Job Satisfaction	0.46***	(0.01)	[0.44,0.49]	0.34***	(0.01)	[0.31,0.36]
Fin Sit: Comfortable	-0.07	(0.04)	[-0.16,0.02]	-0.15***	(0.04)	[-0.22,-0.08]
Fin Sit: OK ♀	0.00			0.00		
Fin Sit: Getting-by	0.50***	(0.04)	[0.42,0.58]	0.50***	(0.04)	[0.43,0.57]
Fin Sit: Difficult	1.43***	(0.07)	[1.29,1.56]	1.43***	(0.06)	[1.32,1.54]
Managers & Administrators ♀	0.00			0.00		
Professional	-0.07	(0.07)	[-0.22,0.07]	0.00	(0.07)	[-0.13,0.14]
Associate Prof & Technical	-0.12	(0.07)	[-0.26,0.02]	-0.14*	(0.07)	[-0.27,-0.01]
Clerical & Secretarial Occs	-0.30***	(0.08)	[-0.45,-0.15]	-0.14*	(0.06)	[-0.25,-0.03]
Craft & Related Occs	-0.55***	(0.07)	[-0.68,-0.41]	-0.29*	(0.13)	[-0.53,-0.04]
Personal & protective serv.	-0.31***	(0.09)	[-0.49,-0.14]	-0.26***	(0.06)	[-0.39,-0.14]
Sales	-0.24*	(0.09)	[-0.43,-0.06]	-0.26***	(0.07)	[-0.40,-0.13]
Plant & Machine Operatives	-0.66***	(0.07)	[-0.80,-0.52]	-0.41***	(0.11)	[-0.62,-0.20]
Other occupations	-0.44***	(0.09)	[-0.61,-0.28]	-0.26***	(0.08)	[-0.40,-0.11]
_constant	-4.22***	(0.25)	[-4.70,-3.74]	-2.45***	(0.20)	[-2.85,-2.05]
N	44478			46858		
N_g	7626			7996		
chi2	2972.58			3198.18		
rho	0.37			0.30		

Legend: p<0.05 * p<0.01** p<0.001 ***
♀ = Reference Category
Source: BHPS 1991-2008

Figure 3.1



For females, two SOC groups, ‘associate professional and technical’ and ‘clerical and secretarial’ occupations report the same effect in terms of the reduction in the log of the odds of being a case (beta = -0.14, $p<0.05$) for each category, which is also the smallest reduction in the log of the odds of being a ‘case’ recorded across all of the SOC groups. Figure 3.1 illustrates the results from the regression models, where again the influence that health status and financial status has on the risk of being a ‘case’ (or experiencing psychiatric morbidity) is clearly visible. The similarity across many of the explanatory variables in terms of the direction of influence and size of the effect for men and women is also apparent, especially across financial situation measures and health status. When we consider the effect that a one unit increase in job-satisfaction has on the risk of being a case, men tend to fare worse, insofar as the log of the odds of being a case are slightly higher for men (beta = 0.46, $p<0.001$) than it is for females (beta = 0.34, $p<0.001$) as dissatisfaction with job increases.

6.6 Summary

Many social surveys support the analysis of quite detailed differences between occupational circumstances, but this information has rarely been explored in depth in relationship to psychiatric morbidity. Using the Adult Psychiatric Morbidity Survey, average patterns for male and female psychiatric morbidity are shown to vary substantially from occupational group to group. Certain occupations are characterised by particularly favourable well-being outcomes, such as advantaged professional categories. The least favourable positions differ between men and women: males in sales and in administrative work have a higher prevalence of mental disorders; for women, caring occupations were more prominently linked to higher prevalence of common mental disorders. Most of these patterns are replicated in modelling using data from the British Household Panel Survey, but there are some variations in occupation-specific inequalities when increasing controls for other factors are introduced into the analysis.

Chapter 7 - Happiness and the role of personal values across Europe: Evidence from the European Social Survey.

7. Introduction

In this chapter, I will explore the relationship between people's subjective assessment of the 'current state of their country's economy' and consider the impact that this has on subjective well-being. In addition, the role that personal values have in mediating this relationship will also be explored, where intrinsic and extrinsic values will be considered. Using three rounds of data from the European Social Survey (ESS), these relationships will be explored across 14 European countries where the entire (sample) population will be considered as a whole in the first instance; countries will then be categorised according to their geographic location within Europe; before they are considered individually. By using three rounds of data from the ESS (2006, 2008 and 2010), I will explore whether these relationships have changed from 2006 (two years prior to the global recession), to 2008 (the year of the financial crisis), to 2010 thus two years after although still in the midst of the finical crisis.

There are several examples of studies that have measured and compared levels of happiness or subjective mental well-being across countries and regions around the world (Hayo, 2007; Kessler et al. 2009;). Some common findings suggest that rich nations, such as the industrially advanced nations in the west, have 'happier' populations when compared to low-income and underdeveloped countries' populations (Delhey, 2010). However, Easterlin (1974; 2001; 2013) asserted that the positive relationship between income and happiness is only true in the short term and is not related in the long-term (Easterlin, 2013: 1) However, within rich societies, at a certain level of affluence, increases in GDP at a national level, or indeed increases in individual or household level income is not associated with increases in happiness (Easterlin, 1974; 2001; Blachflower and Oswald, 2001).

7.1 Research questions to be addressed

1. To what extent have levels of happiness changed across Europe from the period prior to the financial crisis (2006), to during the year of the financial crisis (2008), and two years after (2010) although still in the midst of the financial crisis?
2. How is happiness distributed across a range of socio-demographic and socio-economic characteristics within the European population?
3. What impact does subjective assessment of the present state of a county's economy have in relation to levels of happiness and how has this changed in response to the financial crisis?
4. How do people's intrinsic and extrinsic personal beliefs and values affect overall levels of happiness in European regions?

7.1.1 Intrinsic versus extrinsic personal values

People's personal values are considered to be good indicators of an individual's decisions and actions (Twenge et al. 2010; Georgellis et al. 2009; Ryan et al. 1999). A distinction is often made between intrinsic and extrinsic motivation (Ryan and Deci, 2000: 55). At its most basic level, intrinsic motivation is understood to be the doing of an activity because it is good or valuable in and of itself (Ryan and Deci, 2000). Extrinsic motivation on the other hand refers to an activity that is undertaken not because the activity itself will bring satisfaction, but because the activity will (or at least could) lead to some separable outcome (Deci and Ryan, 2000). Ryan et al (1999) conducted a study using a student sample obtained from two universities, one in the USA and the other from Russia. They found that for both sets of students, those who placed more importance and expectancies on extrinsic goals (wealth, image, fame and power) had poorer levels of mental well-being than those who valued intrinsic goals and expectations.

7.2 Dataset and variables

The European Social Survey (ESS) is a multi country survey that samples over 30 European countries. There are five rounds of the survey to date, 2002, 2004, 2006, 2008 and 2010. This empirical analysis is restricted to countries that have no missing values across the main variables of interest across each of the three rounds. As a result, 14 countries are included within this analysis, they are; Belgium (BE); Switzerland (CH); Germany (DE); Denmark (DK); Spain (ES); France (FR); United Kingdom (GB); Ireland (IE); Netherlands (NL); Norway (NO); Poland (PL); Russian Federation (RU); Sweden (SE); and Slovenia (SI). The entire dataset consists of a total of 44,400 observations, with 13,989 observations in 2006; 15,498 observations in 2008; and 14,913 observations in 2010. The dependent variable in this analysis is the single item measure for happiness ('happy') which is scored on a 10-point Likert scale from (0 to 10) where 0 indicates a person is 'extremely unhappy' and 10 means a person is 'extremely happy'. Satisfaction with the present state of the economy is also measured on a 10-point Likert scale, where 0 indicates that a person is 'extremely dissatisfied' with their country's economy and 10 infers that a person is 'extremely satisfied' with the present state of their country's economy'.

With regards to indicators that measure people's personal values and beliefs. There are several questions, or more precisely statements, scored on a 6-point Likert scale (1 to 6), where respondents are asked to rate the extent to which they agree with each statement. 1 indicates the greatest tendency (very much like me) and 6 indicates the least tendency (not like me at all). In this analysis, the following values and beliefs are included; whether it is important to, *be creative; rich/materialistic; treat people equally; show abilities and be admired; understand different people; make your own decisions and be free; help others and care for other people's well-being; be successful and that other people recognise such success; seek adventure and have an exciting life; get respect from others; follow traditions and customs;* and *seek fun and things that give pleasure in life.* In keeping with Georgellis et al. (2009) I have recoded the personal values variables into dichotomous measures where 1,2 or 3 = 1 (agreeing) and 4 = (no, not like or agreeing).

A range of socio-demographic and socio-economic factors will be controlled for in this analysis, including age (which is restricted to include only people of working age 18-65); gender; marital status; educational attainment; subjective health; income (in deciles). In addition, I will also consider whether being previously unemployed has any affect on how satisfied people are with the state of their country's economy. Georgellis et al (2009) used data from the first two rounds of the European Social Survey and considered whether personal values mitigated the relationship between income and life-satisfaction. They found that not only were personal values good predictors of life-satisfaction, they were also important in mitigating the relationship between income, reference income and life-satisfaction (Georgellis et al. 2009: 329). They argued that their results offered more empirical support for 'relative utility hypothesis' and Rojas' (2007) 'conceptual-referent-theory' (in Georgellis et al. 2009: 329).

7.3 Distribution of happiness across European region

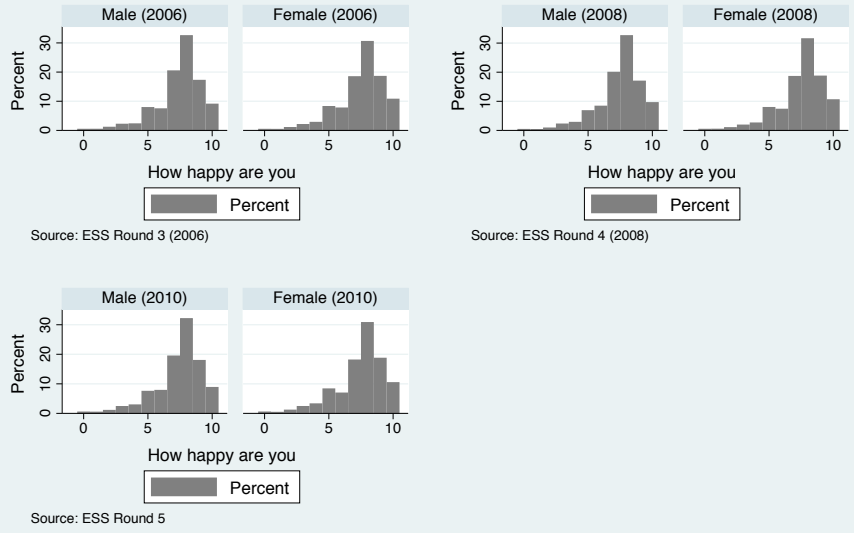
The summary of happiness over each of the three ESS rounds are shown in Table 5. and illustrated graphically in Figure 4. At this stage there is no attempt to split populations by country, and so the figures below correspond to the European population as a whole (or at least contained across 14 countries within the European region). As the summary statistics in Table 5. indicate, there is much similarity in terms of mean and standard deviation of the mean of happiness for both men and women in each year of the surveys. The histograms (Figure 4) confirm the negatively skewed nature of happiness, where more observations are found on the right hand side of the graphs, suggesting that as a whole, European's (within the selected countries) report being relatively happier than they are unhappy with a overall mean of 7.5 for both men and women in both 2006 and 2008, and 7.4 for both men and women in 2010.

Table 5. Summary of happiness by year and gender

		Male			*Female*	
Happiness Score	Obs	Mean	Std.dev	Obs	Mean	Std.dev
Round 3 (2006)	6,870	7.5	1.7	7,111	7.5	1.8
Round 4 (2008)	7,600	7.5	1.7	7,898	7.5	1.8
Round 5 (2010)	7,330	7.4	1.8	7,583	7.4	1.8
Total	21,800	7.5	1.7	22,592	7.5	1.8

Source: ESS Rounds 3, 4 & 5

Figure 4. Happiness by Year and Gender



Source: ESS Round 3 (2006)

Source: ESS Round 4 (2008)

Source: ESS Round 5

7.4 Distribution of happiness by country and year

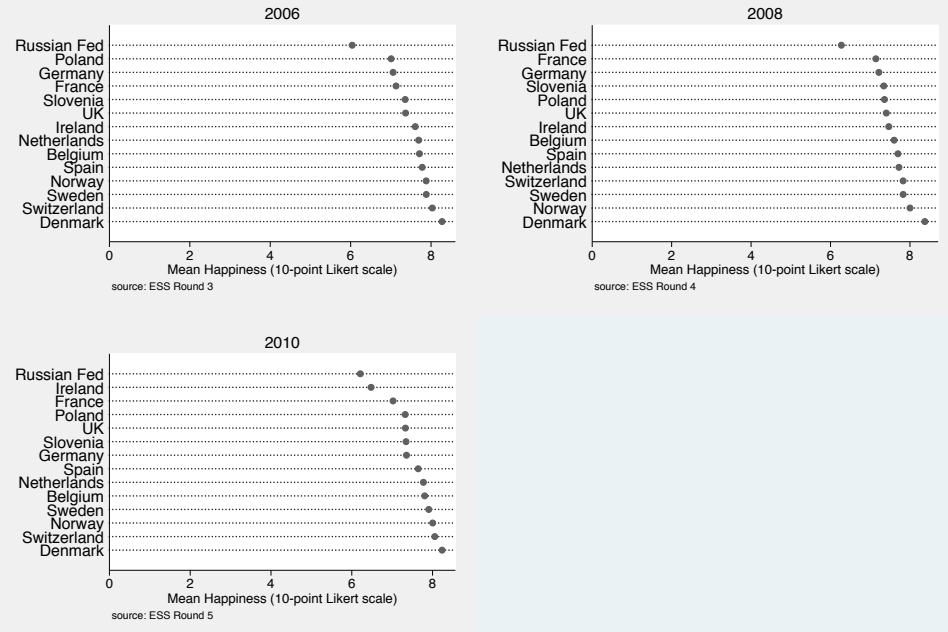
The mean happiness score for each of the 14 European countries included in this analysis are considered in the following section. Table 5.1 lists each of the countries with number of observations, mean and standard deviation of mean happiness scores over the three rounds. This information is also displayed in Figure 4.1 via a dot-plot where the countries are ranked in chronological order starting with those with the lowest (unhappiest) scores to those with the highest (happiest) average score for each country. Of all of the European countries included in the analysis, the Russian Federation reports the lowest mean happiness score across each of the rounds of data, with a low of 6.0 in round 3, to a high of 6.3 in round 4 and back down slightly to 6.2 in round 5. At the opposite end of the spectrum is Denmark, which consistently records the highest (and therefore happiest) happiness scores across each of the three rounds, with an average of approximately 8.3 overall. The difference between the 'happiest' country and the 'unhappiest' country is 2.3 points (in round 3), 2.1 points (in round 4) and 2 points (in round 5). Looking across each individual country's mean happiness score, there is not much fluctuation from one round to the next except for Ireland, which has a mean happiness score of 7.6 (in round 3), a score of 7.5 (in round 4) but a score of 6.5 (in round 5), which is the largest fluctuation (of 1.1 points) across the three rounds for any country.

Table 5.1 **Summary of happiness by country and round (year)**

Country	(2006) Round 3			(2008) Round 4			(2010) Round 5		
	Obs	Mean	Std.dev	Obs	Mean	Std.dev	Obs	Mean	Std.dev
Russian Fed	769	6.0	2.1	949	6.3	2.1	1,043	6.2	2.1
Poland	914	7.0	2.0	873	7.3	1.9	883	7.3	1.9
Germany	1,489	7	2.0	1,640	7.2	1.9	1,701	7.4	1.9
France	1,304	7.1	1.8	1,379	7.1	1.8	1,154	7.0	1.8
Slovenia	687	7.3	1.8	620	7.3	1.9	576	7.3	1.8
United Kingdom	1,132	7.4	1.9	1,385	7.4	1.8	1,224	7.3	1.8
Ireland	693	7.6	1.8	1,119	7.5	1.8	1,065	6.5	2.3
Netherlands	1,178	7.7	1.3	1,164	7.7	1.3	1,063	7.8	1.4
Belgium	1,146	7.7	1.5	1,174	7.6	1.6	1,121	7.8	1.4
Spain	786	7.8	1.5	1,067	7.7	1.6	1,082	7.6	1.5
Norway	947	7.9	1.6	1,047	8.0	1.4	1,132	8.0	1.4
Sweden	1,079	7.9	1.5	1,068	7.8	1.5	952	7.9	1.5
Switzerland	925	8	1.4	976	7.8	1.5	902	8.1	1.4
Denmark	940	8.3	1.3	1,037	8.4	1.2	1,015	8.2	1.4
Total	6,870	7.5	1.7	7,600	7.5	1.7	7,330	7.4	1.8

Source: ESS Rounds 3, 4 & 5 (2006, 2008 & 2010)

Figure 4.1 Mean Happiness in European Countries by Year



In Figure 4.1 each country is ordered from those with the lowest to the highest mean happiness scores. It is apparent that the Nordic countries of Denmark, Norway and Sweden consistently score highest in all rounds of the survey. Switzerland, Belgium and the Netherlands are also found in the bottom third of the dot-plots in each survey year. Spain, which is the only country in the list that is located in the South of Europe, is also similar in terms of its average happiness score as those that have been mentioned thus far. A mix of Eastern and Western European countries make up the first half of the dot-plots (therefore

reporting the lowest mean happiness scores). As noted previously, of all the countries, Ireland moved from being seventh in the list of 14 countries in terms of mean happiness scores in round 3 and 4, and jumped to second place in round 4, where only Russia reported a lower mean happiness score. France and Germany, both Western European countries are also positioned at the top of the dot-plots in each round of the survey.

7.5 Correlation between satisfaction with economy and subjective happiness

Table 5.2 shows the correlation between happiness and subjective assessment of the current state of each country's economy in each round of the European Social Survey (ESS). The correlation between 'satisfaction with current state of the economy' and 'subjective happiness' is positive and significant (at the level 1%) in all countries and years (rounds) of the survey data. This means that as people are more satisfied with the state of their country's economy (score increases), then people are also more likely to be subjectively happier (score increases also). If we consider the difference in the strength of the correlation between countries in 2006, the correlation is strongest in Poland, Russian Federation, France and Germany, and is weakest in Spain and Norway for example. In 2008, the year of the financial crisis, the strength of the correlation in each country was lower than in the previous round (two years previous). This reduction in the strength of the correlation is most notable in France, the United Kingdom, and in Sweden. In other cases, this reduction is negligible, as in the Netherlands and Norway for example. In terms of the strength of the correlation across countries in 2008, Russia, Germany and Poland show the strongest correlation, while Ireland, Norway and Spain have the weakest correlation at .15.

If we consider the correlation statistics in round 5 (2010), which is two years after, although still in the midsts of the financial crisis, there is much variation across countries, but also variation within some countries. The overall picture in terms of the countries with the strongest correlation remains relatively unchanged, with Germany, Poland and Russia again showing the strongest correlation. Notably, in the Netherlands, the strength of the correlation has increased to surpass that of Russia in 2010. Norway, Spain and Ireland, like in the previous rounds, show the weakest correlations. Belgium was the only country that showed the exact same correlation statistic in 2008 and 2010.

Table 5.2 Correlation between 'satisfaction with current state of economy' and 'subjective happiness' and showing 95% confidence intervals around the correlation

Countries	2006 sat' with economy [95% ci]	2008 sat' with economy [95% ci]	2010 sat' with economy [95% ci]
Belgium	0.26*** [.21, .31]	0.22*** [.17, .28]	0.22*** [.17, .28]
Switzerland	0.24*** [.18, .30]	0.21*** [.15, .27]	0.25*** [.19, .31]
Germany	0.31*** [.27, .36]	0.27*** [.23, .32]	0.35*** [.31, .39]
Denmark	0.23*** [.17, .29]	0.18*** [.12, .24]	0.23*** [.17, .28]
Spain	0.13*** [.06, .20]	0.15*** [.09, .21]	0.09*** [.04, .15]
France	0.32*** [.28, .37]	0.23*** [.18, .28]	0.26*** [.21, .32]
United Kingdom	0.29*** [.24, .35]	0.18*** [.13, .23]	0.27*** [.22, .33]
Ireland	0.21*** [.13, .28]	0.15*** [.09, .21]	0.10*** [.04, .16]
Netherlands	0.25*** [.19, .30]	0.24*** [.18, .29]	0.33*** [.27, .38]
Norway	0.16*** [.01, .22]	0.15*** [.09, .20]	0.20*** [.15, .26]
Poland	0.33*** [.28, .39]	0.27*** [.21, .33]	0.34*** [.28, .40]
Russian Federation	0.32*** [.26, .38]	0.29*** [.23, .35]	0.32*** [.27, .38]
Sweden	0.25*** [.20, .31]	0.16*** [.11, .22]	0.24*** [.18, .30]
Slovenia	0.29*** [.22, .36]	0.24*** [.16, .31]	0.32*** [.24, .39]
All	0.35*** [.34, .36]	0.26*** [.25, .28]	0.32*** [.31, .34]

* Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level
Source: ESS Rounds 3, 4 & 5.

95 percent confidence intervals around the correlation are also reported in Table 5.2. It is therefore possible to establish whether individual country's correlations are significantly different from the cross-country average (when all countries are included). Where confidence intervals overlap cross-country confidence intervals, then that country's correlation is not significantly different from the cross-country average. With regards to those countries that are significantly different in each round of the survey (i.e. confidence intervals do not overlap cross-country confidence intervals); Denmark, Spain, Ireland, Norway and Sweden fall into this category. Conversely, Germany, France, Poland, Russian Federation and Slovenia are not significantly different from the cross-country average correlation in all three rounds of the survey. The Netherlands and Switzerland both report a significantly different correlation from the cross-country average in round 3 (2006), but not in the fourth (2008) or fifth (2010) rounds of the survey. Belgium reports a significantly different correlation from the cross-country average in 2006 and 2010 but not in 2006, while in the United Kingdom the opposite pattern is true, where the correlation is significantly different only in 2006 and not in the other two rounds.

7.6 Analysis

In the first three weighted[1] regression models reported in Table 5.3, no distinction is made between any of the 14 countries. That is to say that I am considering here the entire population of these European countries in one sample. The purpose of these models are to provide the reader with a general picture regarding the relationship between happiness and in the first instance a selection of socio-demographic and socio-economic measures. Gender; age; marital status; educational background; subjective health status; household monthly income; and financial situation are all considered in these models.

The results from these regression models show that females across Europe report being on average, more happy than their male counterparts. This might be considered a contradictory claim since females are more likely to be diagnosed with a mental health 'problem' than are men (Singleton, 2001). However, this finding is replicated in other studies that consider levels of happiness by gender in countries across the world (Van de Velde et al. 2010). The relationship between age and happiness is also well-documented. The U shaped pattern indicates that as people get older their levels of happiness decrease, reflecting life-cycle aspects of people's social, economic and family circumstances (Bebbington et al. 1998; Blanchflower and Oswald, 2008.)

[1]Design weights and population weights are applied to all regression models in this chapter. The design weight (DWEIGHT) corrects for possible sample selection bias where some groups and regions have higher probability of being selected than others. The DWEIGHT is calculated as the inverse of the inclusion probability and then scaled such that their sum equals the net sample size. Population weights (PWEIGHT) are used when we are examining two or more countries combined and they correct for fact that different countries within the ESS have different populations. PWEIGHTS are the same for all individuals within a country but differ across countries. They are calculated as the [population size aged 15 years and older] / [Net sample size in country) * 10000]. See http://www.europeansocialsurvey.org/weightingESSdata.

Table 5.3 Linear Regressions Models: Happiness (10-point Likert scale) by year (all countries included as one sample) controlling for socio-demographic and socio-economic characteristics.

Happy (Likert Scale)	Model 1	(2006)	Model 2	(2008)	Model 3	(2010)
	Coef.	(se)	Coef.	(se)	Coef.	(se)
Female	0.14**	(0.05)	0.16***	(0.04)	0.19***	(0.04)
Age	-0.10***	(0.01)	-0.06***	(0.01)	-0.05***	(0.01)
Age2	0.001***	(0.00)	0.001***	(0.00)	0.001***	(0.00)
Married (rc)	0.00	-	0.00	-	0.00	-
Divorced/Separated	-0.63***	(0.08)	-0.53***	(0.07)	-0.56***	(0.07)
Widowed	-0.75***	(0.16)	-0.76***	(0.16)	-0.81***	(0.13)
Never Married	-0.49***	(0.06)	-0.54***	(0.07)	-0.33***	(0.06)
.Less than lower secondary education	0.55***	(0.09)	0.29**	(0.09)	0.26**	(0.09)
.Lower secondary educ' completed	0.17*	(0.07)	0.13*	(0.06)	0.23***	(0.07)
Upper secondary education completed(rc)	0.00	-	0.00	-	0.00	-
.Post secondary non-tertiary education	0.32***	(0.10)	0.13	(0.09)	0.16	(0.09)
.Tertiary education	0.04	(0.05)	-0.03	(0.05)	-0.08	(0.05)
Very good health	0.49***	(0.04)	0.47***	(0.05)	0.50***	(0.05)
Good health(rc)	0.00	-	0.00	-	0.00	-
Fair health	-0.49***	(0.06)	-0.63***	(0.06)	-0.53***	(0.06)
Poor health	1.07***	(0.12)	-1.15***	(0.12)	-1.20***	(0.12)
.Children live in household	.12*	(0.05)	0.03	(0.05)	0.16**	(0.05)
.Been unemployed in past 3 months	-0.07	(0.05)	-0.03	(0.05)	-0.10*	(0.05)
.Household monthly income (deciles)	0.07***	(0.01)	0.02*	(0.01)	0.02	(0.01)
.Live comfortable on present income	0.38***	(0.05)	0.51***	(0.05)	0.50***	(0.05)
Coping on present income(rc)	0.00	-	0.00	-	0.00	-
.Difficult on present income	-0.75***	(0.07)	-0.65***	(0.07)	-0.72***	(0.07)
Very difficult on present income	-1.15***	(0.15)	-1.43***	(0.14)	-1.34***	(0.14)
_constant	9.12***	(0.28)	8.73***	(0.27)	8.42***	(0.30)
N	13932		15463		14893	
ll	-26952.28		-29871.42		-28875.70	
bic	54095.41		59935.76		57943.58	
r2	0.24		0.22		0.21	

* p<0.05, ** p<0.01, *** p<0.001

Design weight (DWEIGHT) and population weight (PWEIGHT) applied.

Source: ESS Rounds 3 (2006), 4 (2008), 5 (2010)

Another common finding which is also evinced in these models is that being married (or in a civil partnership) is beneficial for mental health. Being divorced/separated, widowed, and never having married (not cohabiting) are all associated with a reduction in levels of happiness. With regards to educational attainment; having 'completed upper-secondary school education' serves as the reference category in these models. Although initially somewhat paradoxical, compared to the reference group, people who have less than lower-

secondary education are statistically happier than those who have completed lower-secondary education, and happier still than those who have completed upper-secondary education. Compared to the reference category, in 2006, having post-secondary education was also associated with an increase in happiness, although this was not significant in 2008 or 2010. It could be that as people get more education and by extension, qualifications, their expectations increase. However, in times of recession, having such qualifications may not necessarily lead to better employment opportunities or income for example.

A common and perhaps not unsurprising finding concerns health status and its relationship with happiness. Simply stated, people who report having good or indeed excellent subjective health are also happier than those who have less than optimum subjective health. It must be considered however, that subjective health might also include ones assessment of their mental health, social and physical health. Being 'unemployed in the past three months' does not significantly affect happiness in either 2006 or 2008, although is significant in 2010, eliciting a negative effect on happiness. However, as is demonstrated in the preceding regression models, previous spells of unemployment have a significant and negative impact on happiness in each of the selected rounds in both Western European countries and Eastern European countries, while this is not significant in Nordic countries. This finding may be related to the extent of welfare provision that the latter regions provide for its citizens (Esping-Andersen, 1990). Income, which is measured in deciles, has a positive effect on happiness. This is a common finding and the effect that income has on mental well-being is one of diminishing returns; that is, as you move beyond a certain threshold, increasing income does not produce *more* happiness or better mental well-being (Easterlin, 2013). Financial situation is also considered in the model. A clear pattern emerges; compared to people who are 'coping with their present income', people who feel that they are 'comfortable' in terms of their income are happier, while groups who find it 'difficult' and 'very difficult' to cope on their present income have poorer levels of happiness.

7.6.1 Extended regression models: entire sample

In Table 5.4, the results from the extended regression models, which includes one's 'satisfaction with the economy' and 'personal values and beliefs' questions are presented. For people who report being satisfied with the present state of their country's economy, a positive and significant effect on happiness is reported. The size of this effect is weakest in the year of the financial crash (round 4; 2008), and largest in 2010 (round 5). As a result of including the 'satisfaction with the economy' indicator, the size of the effect that financial situation has on happiness has reduced slightly, which is true across all covariates. In the final section of Table 5.4, the personal beliefs and values indicators and their impact on happiness are reported. There are some variation in terms of what statements have a significant effect on happiness across the three rounds of data. The importance of being 'rich' or materialistic is significant across each of the three rounds, resulting in a significant negative effect on subjective happiness. This echoes findings reported by Ryan et al (1999), whereby favouring extrinsic values and goals had a detrimental impact on people's mental well-being. It is interesting to note that the size of the negative effect that being 'rich/materialistic' has on happiness is lowest in round 4 (2008), the year of the financial crisis (beta = -.15, $p<0.01$), compared to the previous round in 2006 (beta = -.20, $p<0.001$) or in round 5 (2008) (beta = -.26, $p<0.001$).

Also significant in each round of the survey and resulting in a positive effect on the outcome is the 'importance in helping people and caring for others well-being' and 'seeking fun and pleasure in life'. The size of the effect on the dependent variable for each of these indicators are similar and vary little across the three rounds (approximately, beta = .25, $p<0.001$). The importance of being 'creative' also elicits a positive effect on subjective happiness, which was strongest in round 4 (2008) (beta=.22, $p<0.01$), compared to round 5 (2010) (beta=.16, $p<0.05$), and not significant in round 3 (2006). The importance of 'treating people equally' is not signifiant in 2008, although in 2006 and 2010 a significant and positive effect on happiness is reported.

Table 5.4 Linear Regression Results: Entire European population included as one sample. Socio-demographic, socio-economic, subjective assessment of economy and personal values controlled for in models.

Happy (Likert Scale)	Model 4	(2006)	Model 5	(2008)	Model 6	(2010)
	Coef.	(se)	Coef.	(se)	Coef.	(se)
Female	0.15***	(0.04)	0.17***	(0.04)	0.19***	(0.04)
Age	-0.10***	(0.01)	-0.06***	(0.01)	-0.06***	(0.01)
Age2	0.001***	(0.00)	0.001***	(0.00)		0.001***
(0.00)						
Married (rc)	0.00	-	0.00	-	0.00	-
Divorced/Separated	-0.63***	(0.08)	-0.54***	(0.07)	-0.58***	(0.07)
Widowed	-0.75***	(0.16)	-0.73***	(0.15)	-0.80***	(0.12)
Never Married	-0.50***	(0.06)	-0.56***	(0.06)	-0.36***	(0.06)
.Less than lower secondary education	0.53***	(0.09)	0.32***	(0.09)	0.33***	(0.09)
.Lower secondary education completed	0.11	(0.06)	0.14*	(0.06)	0.21***	(0.06)
.Upper secondary education completed(rc)	0.00	-	0.00	-	0.00	-
.Post secondary non-tertiary education	0.23*	(0.10)	0.07	(0.09)	0.06	(0.08)
.Tertiary education	0.01	(0.05)	-0.02	(0.05)	-0.05	(0.05)
Very good health	0.44***	(0.04)	0.43***	(0.05)	0.46***	(0.05)
Good health(rc)	0.00	-	0.00	-	0.00	-
Fair health	-0.44***	(0.06)	-0.58***	(0.06)	-0.46***	(0.05)
Poor health	-1.10***	(0.12)	-1.11***	(0.12)	-1.12***	(0.12)
.Children live in household	0.14**	(0.05)	0.04	(0.05)	0.17**	(0.05)
.Been unemployed in past 3 months	-0.06	(0.05)	-0.02	(0.05)	-0.07	(0.05)
.Household monthly income (deciles)	0.05***	(0.01)	0.03**	(0.01)	0.01	(0.01)
.Live comfortable on present income	0.26***	(0.05)	0.41***	(0.04)	0.38***	(0.04)
.Coping on present income(rc)	0.00	-	0.00	-	0.00	-
.Difficult on present income	0.67***	(0.07)	-0.58***	(0.07)	-0.62***	(0.07)
.Very difficult on present income	-1.05***	(0.14)	-1.33***	(0.14)	-1.19***	(0.14)
.Satisfied with present state of country's economy	0.62***	(0.04)	0.56***	(0.04)	0.73***	(0.04)
Creative	0.08	(0.06)	0.22***	(0.05)	0.16*	(0.06)
Materialistic/rich	-0.20***	(0.05)	-0.15**	(0.05)	-0.26***	(0.05)
Treat people equally	0.17*	(0.08)	0.10	(0.08)	0.25**	(0.09)
.Show abilities and be admired	-0.09	(0.05)	-0.06	(0.05)	-0.12**	(0.05)
.Be free and make own decisions (autonomy)	-0.06**	(0.02)	-0.03	(0.02)	-0.04	(0.02)
.Help people and care for others well-being	0.23**	(0.08)	0.25***	(0.07)	0.26**	(0.09)
Respect from others	-0.07	(0.05)	-0.08	(0.04)	-0.11*	(0.05)
.Follow traditions and customs	0.08	(0.05)	0.03	(0.04)	0.10*	(0.05)
.Seek fun and pleasure (hedonic)	0.22***	(0.05)	0.27***	(0.05)	0.23***	(0.05)
_constant	8.80***	(0.31)	8.11***	(0.30)	7.98***	(0.33)
N	13932		15463		14893	
ll	-26642.86		-29600.87		-28460.59	
bic	53571.99		59491.14		57209.45	
r2	0.27		0.25		0.26	

* p<0.05, ** p<0.01, *** p<0.001

(rc) = Reference Category

Notes: Satisfaction with economy and all personal values and beliefs indicators are dichotomous.0=not like me & 0=not satisfied with state of economy.
Design weight (DWEIGHT) and population weight (PWEIGHT) applied.
Source: ESS Rounds 3 (2006), 4 (2008), 5 (2010)

With regards to personal beliefs that result in a decrease in average happiness, is the importance of 'showing abilities and being admired by others' (beta = -.12, $p<0.01$) and getting 'respect from others' (beta = -.11, $p<0.05$), both of which are only significant in round 5, Model 6 (Table 5.4). The amount of variation in the dependent variable that is explained by adding the aforementioned measures relating to personal values and beliefs, and satisfaction with the present state of the economy is relatively small. In the regression models (1, 2 and 3) presented in Table 5.3 where only socio-demographic and socio-economic characteristics were controlled for, 24 percent of variation in the response was explained in 2006 (model 1), 22 percent in model 2 (2008), and 21 percent in model 3 (2010). After including the additional explanatory factors (Table 5.4); namely, 'subjective assessment of the country's economy' and 'personal values and beliefs', the R^2 in each instance has only increased by .03 (model 7), .02 (model 8) and .04 (model 9).

7.6.2 Comparing different European regions

As previously noted, there are 14 European countries present within the data sample and of these countries, seven are located in Western Europe (Belgium, Switzerland, Germany, France, United Kingdom, Ireland and Netherlands); three are in Northern Europe (Denmark, Noway and Sweden); three are in Eastern Europe (Poland, Russian Federation and Slovenia); and only one (Spain) is located in Southern Europe. There are several ways in which these European countries could be grouped together. For the purpose of this chapter, I have decided to group European countries based on their geographic location, the strategy that is also employed by Georgellis et al. (2009). Since Spain alone is located in Southern Europe, only three European regions are considered in the following analysis; Western Europe, Northern Europe and Eastern Europe. Table 5.6 shows the results when Nordic countries populations are considered, and Table 5.7 shows the results when Eastern European countries are included in the models.

As the main focus of this section of the analysis is to consider the impact that 'satisfaction with the current state of a country's economy' and 'personal values and beliefs' have on 'subjective happiness scores', only these aforementioned indicators are reported in the tables below, except gender, which is controlled for in each of the regression models. However, all of the socio-demographic and socio-economic covariates that have been included in the regression models in the previous table (Table 5.4) are still controlled for. Each tables results will be considered separately, where coefficients will be compared across each round of the survey. However, comparisons will also be made between tables and thus between results in each of the European regions outlined above.

7.6.3 Satisfaction with economy across and between European regions

In Western European countries (Table 5.5), 'satisfaction with the present state of the economy' is associated with a positive and significant effect on the response (happiness). This positive effect was strongest in the most recent round of the survey included in this analysis, 2010 (model 7) (beta = .63, $p<0.001$). This effect was slightly weaker in 2006 (beta = .55, $p<0.001$), and was weakest in the year of the financial crisis (2008) (model 8) (beta = .47, $p<0.001$). A similar pattern emerges in Nordic countries (Table 5.6), where 'satisfaction with the economy' is positive and significant in each round of the survey, and where this association is weakest, in terms of the size of the effect that is reported, in 2008 of the survey (round 4). However, the size of the effect that 'satisfaction with the economy' elicits in Nordic countries in each round (beta = .93, $p<0.001$ in 2006); (beta =.88, $p<0.001$ in 2008) and (beta = 1.07, $p<0.001$) is larger than those reported in Western European as well as Eastern European countries also.

When we consider Eastern European countries and the effect that 'satisfaction with the economy' has on average 'happiness' scores (Table 5.7). There is much less variation in terms of the size of the effect that is reported across each round, where (beta = .35, $p<0.001$) is recorded in both round 3 (2006) and round 5 (2010) and in the year of the financial crisis (2008) (beta = .31, $p<0.001$). These initial results would indicate that being 'satisfied with present state of the economy' elicits a greater positive effect on the outcome (therefore increasing average happiness) in Nordic countries (Table 5.6) when compared to

Western European countries (Table 5.5) or Eastern European countries (Table 5.7). However, true of all European regions, is that the size of the effect that 'satisfaction with the economy' has on 'happiness', was smaller in 2008, when compared to the other two rounds (2006) and (2010).

7.6.4 Personal values in European regions

I now consider the impact that the selected 'personal values and beliefs' have on 'happiness' across each of the three European regions. Focus will be placed first on those values that result in a positive effect on happiness (improving happiness in other words), before the personal values that are associated with eliciting a negative effect on happiness are considered.

In Western countries (Table 5.5), being creative is associated with a positive and significant effect on happiness only in 2008 (round 4) (beta = .14, $p<0.05$). A similar pattern is reported for those in Nordic countries (Table 5.6), where being 'creative' increases the coefficient of 'happiness', although this was, like in the west, only significant in round 4 (2008) (beta = .29, $p<0.05$). In Eastern European countries (Table 5.7), being 'creative' appears not to have a significant effect on 'happiness' in any of the rounds of the survey. In Western Europe (Table 5.5) only, people who believe that 'treating people equally' is important, results in a positive and significant association with the response. This is true in 2006 (model 7) (beta = .38, $p<0.001$) and in 2010 (model 9) (beta = .29, $p<0.01$). However, in 2008 this association is found not to be significant. 'Helping people and caring for others well-being' is associated with increasing 'happiness' in Western countries (Table 5.5) in 2008 (beta = .16, $p<0.05$). In Nordic countries (Table 5.6) this was found to be significant in 2006 (model 10) (beta = .41, $p<0.05$). In Eastern European countries (Table 5.7) 'helping people and caring for others well-being' results in a positive significant effect on 'happiness' in both 2006 (beta = .22, $p<0.01$) and 2010 (beta = .20, $p<0.05$) but not in 2008.

The only other personal value that is associated with increasing average happiness in Western countries is reported for those who give importance to 'seeking fun and pleasure

in life'. This is significant in each round of the survey and varies little from round to round, although is strongest in 2008 (beta = .29, p<0.001). A similar pattern is reported in Eastern European countries (Table 5.7), where 'seeking fun' increases the coefficient for happiness in each round of the survey and is strongest in round 5 (2010) (beta = .27, p<0.001). However, this specific personal value is not significant in any of the rounds for Nordic countries (Table 5.6). The importance of 'following traditions and customs' increases average happiness in all three rounds in Eastern Europe (Table 8.8), where this association was strongest in 2008 (beta = .20, p<0.001). In Nordic countries (Table 5.6), 'following traditions and customs' significantly increased happiness in only round 5 (2010) (beta = . 33, p<0.05).

With regards to those values and beliefs that produce a negative, and therefore detrimental effect on happiness. Being 'materialistic' results in a negative effect on 'happiness' in all European regions, although not across all rounds of the survey. In Western European countries (Table 5.5), this was significant in 2006 (beta = -.21, p<0.001), reducing slightly in 2008 (beta = -.17, p<0.01), but not significant in 2010. In Nordic countries (Table 5.6), being materialistic produces the largest negative impact on happiness of all the regions, which was significant in 2006 (beta = -.23, p<0.05), also in 2010 (beta = -.39, p<0.001), but not significant in 2008 (the year of the financial crisis). The opposite is found in Eastern European countries (Table 5.7), where being materialistic was associated with a significant negative effect on happiness in 2008 (beta = -.17, p<0.01) but not significant in either 2006 or 2010. There are three remaining personal values that are associated with producing a negative effect on happiness, but each one is specific to a different region. In Western European countries (Table 5.5), wanting 'respect from others' reduced happiness coefficients in both 2006 and 2008 (models 7 & 8) (beta = -.12, p<0.05 and beta = -.13, p<0.01) respectively. In Nordic countries (Table 5.6), 'being free to make own decisions' was associated with a negative effect on happiness in 2006 (model 10) (beta = -.16, p<0.01) and in 2010 (model 13) (beta = -.17, p<0.01) but not in 2008. Finally, and with regards to Eastern European countries (Table 5.7), giving importance to 'showing abilities and being admired by others' produced a statistically significant, negative effect on happiness in 2010 (model 15) (beta = -.17, p<0.01) but not in 2008 or 2006.

With regards to the personal values that are found not to have a significant effect on the dependent variable. In Western countries, ‘showing abilities and being admired by others’, ‘being free to make own decisions’ and ‘following traditions and customs’ were not significant. In Nordic countries, ‘treating people equally’, ‘showing abilities and being admired by others’, getting ‘respect from others’ and ‘seeking fun and pleasure in life’ were not significant. Lastly, in Eastern European countries, being ‘creative’, ‘treating people equally’, getting ‘respect from others’ and being ‘free to make own decisions’ do not significantly affect the outcome. These initial results support the hypothesis that placing importance on extrinsic values, such as ‘being rich/materialistic’, and wanting to be ‘admired by others’ and ‘respected by others’ for example, can be detrimental for mental health and happiness more generally. Moreover, intrinsic values, such as being ‘creative’, ‘treating people equally’, and ‘helping people and caring for others’ well-being’ for example is associated with increasing happiness, else happier people place importance on such values.

The amount of variation in the response that is explained by the covariates in each of the nine models is reported at the foot of each table. In Western European countries (Table 5.5) and Nordic countries (Table 5.6), between 22 percent and 25 percent of variation in happiness is explained in each of the models. In Eastern European countries (Table 5.7), between 17 percent and 20 percent of variation is explained by the covariates included in the models.

Table 5.5 Regression results by year (Western European countries only). Controlling for socio-demographic, socio-economic factors and including satisfaction with country's economy and personal values and beliefs.

Happy (Likert Scale)	Model 7	(2006)	Model 8	(2008)	Model 9	(2010)
	Coef.	(se)	Coef.	(se)	Coef.	(se)
Female	0.19***	(0.05)	0.12**	(0.04)	0.22***	(0.05)
.Satisfied with present state of country's economy	0.55***	(0.05)	0.47***	(0.05)	0.63***	(0.04)
Creative	0.10	(0.06)	0.14*	(0.05)	0.05	(0.06)
Materialistic/rich	-0.21***	(0.06)	-0.17**	(0.06)	-0.03	(0.06)
Treat people equally	0.38***	(0.09)	-0.06	(0.07)	0.29**	(0.10)
.Show abilities and be admired	-0.09	(0.05)	-0.08	(0.05)	-0.09	(0.05)
.Be free and make own decisions (autonomy)	-0.00	(0.02)	-0.01	(0.02)	0.01	(0.02)
.Help people and care for others well-being	0.10	(0.08)	0.16*	(0.07)	0.11	(0.09)
Respect from others	-0.12*	(0.05)	-0.13**	(0.05)	-0.03	(0.05)
.Follow traditions and customs	0.05	(0.05)	0.03	(0.05)	0.07	(0.05)
.Seek fun and pleasure	0.27***	(0.05)	0.29***	(0.05)	0.25***	(0.05)
_constant	8.36***	(0.35)	8.24***	(0.31)	8.00***	(0.34)
N	7838		8832		8228	
ll	-14501.62		-16378.96		-15177.85	
bic	29272.24		33030.50		30626.16	
r2	0.24		0.22		0.24	

* p<0.05, ** p<0.01, *** p<0.001

Notes: Only Western European countries included; Belgium, Switzerland, Germany, France, United Kingdom, Ireland, Netherlands.

Design weight (DWEIGHT) and population weight (PWEIGHT) applied.
Source: ESS Rounds 3 (2006), 4 (2008), 5 (2010)

Table 5.6 Regression results by year (Nordic countries only). Controlling for socio-demographic, socio-economic factors and including satisfaction with country's economy and personal values and beliefs.

Happy (Likert Scale)	Model 10	(2006)	Model 11	(2008)	Model 12	(2010)
	Coef.	(se)	Coef.	(se)	Coef.	(se)
Female	0.13**	(0.05)	0.19***	(0.05)	0.13*	(0.05)
.Satisfied with present state of country's economy	0.93***	(0.13)	0.88***	(0.12)	1.07***	(0.11)
Creative	0.08	(0.13)	0.29*	(0.13)	0.16	(0.15)
Materialistic/rich	-0.23*	(0.12)	-0.04	(0.12)	-0.39***	(0.12)
Treat people equally	-0.14	(0.19)	0.24	(0.18)	0.08	(0.21)
.Show abilities and be admired	-0.05	(0.14)	0.16	(0.13)	-0.11	(0.13)
.Be free and make own decisions (autonomy)	-0.16**	(0.06)	-0.03	(0.06)	-0.17**	(0.06)
.Help people and care for others well-being	0.41*	(0.17)	0.28	(0.16)	0.23	(0.19)
Respect from others	0.05	(0.14)	0.22	(0.14)	-0.12	(0.15)
.Follow traditions and customs	0.13	(0.16)	0.13	(0.15)	0.33*	(0.16)
.Seek fun and pleasure	0.07	(0.12)	0.08	(0.11)	0.05	(0.12)
_constant	9.03***	(0.74)	7.92***	(0.71)	8.37***	(0.79)
N	2,347		2,423		2,488	
ll	-4758.11		-4911.45		-5037.29	
bic	9749.05		10056.69		10309.15	
r2	0.25		0.23		0.25	

* p<0.05, ** p<0.01, *** p<0.001

Notes: Only Nordic countries included in models; Denmark, Norway and Sweden.

Design weight (DWEIGHT) and population weight (PWEIGHT) applied
Source ESS Rounds 3 (2006), 4 (2008) & 5 (2008)

Table 5.7 Regression results by year (Eastern European Countries only). Controlling for socio-demographic, socio-economic factors and including satisfaction with country's economy and personal values and beliefs.

Happy (Likert Scale)	Model 13 (2006)		Model 14 (2008)		Model 15 (2010)	
	Coef.	(se)	Coef.	(se)	Coef.	(se)
Female	0.16	(0.12)	0.33**	(0.11)	0.32**	(0.11)
.Satisfied with present state of country's economy	0.35***	(0.07)	0.32***	(0.05)	0.35***	(0.06)
Creative	0.12	(0.06)	0.09	(0.07)	0.08	(0.06)
Materialistic/rich	-0.06	(0.06)	-0.17**	(0.06)	-0.01	(0.07)
Treat people equally	-0.12	(0.07)	-0.04	(0.07)	0.08	(0.07)
.Show abilities and be admired	-0.10	(0.06)	-0.08	(0.06)	-0.17**	(0.05)
.Be free and make own decisions (autonomy)	-0.00	(0.03)	0.00	(0.02)	-0.01	(0.02)
.Help people and care for others well-being	0.22**	(0.08)	0.15	(0.08)	0.20*	(0.10)
Respect from others	-0.09	(0.05)	-0.01	(0.05)	-0.02	(0.06)
.Follow traditions and customs	0.13*	(0.05)	0.20***	(0.05)	0.14**	(0.05)
.Seek fun and pleasure	0.22***	(0.06)	0.19***	(0.06)	0.27***	(0.06)
_constant	8.85***	(0.38)	8.29***	(0.37)	8.09***	(0.41)
N	2,961		3,147		3,096	
ll	-4976.58		-5282.50		-5262.16	
bic	10192.95		10806.63		10765.45	
r2	0.20		0.17		0.18	

* p<0.05, ** p<0.01, *** p<0.001

Notes: Only Eastern European countries included in models; Poland, Slovenia and Russian Federation.

Design weight (DWEIGHT) and population weight (PWEIGHT) applied.
Source ESS Rounds 3 (2006), 4 (2008) & 5 (2008)

7.7 Comparing happiness in European countries with happiness in United Kingdom

Instead of amalgamating countries' populations based on their geographic location, in this section I have included each country as a dummy variable and used the United Kingdom as the reference category against which all of the remaining 13 countries are compared. The results from the three regression models are shown in Table 5.8 and as with the previous regression models, socio-economic and socio-demographic characteristics are controlled for but not reported here in the main body of text. These results demonstrate the extent to which levels of happiness in European countries vary significantly from levels in the

United Kingdom over the three rounds of the survey. All regressions are weighted (using design and population weights) and calculated with robust standard errors.

As would be expected, 'gender', 'satisfaction with the economy' and 'personal values and beliefs' have the same overall effect on the outcome as those which have been reported in previous models. That is to say that on average, females report being happier than their male counterparts; people who are satisfied with the current state of their country's economy are generally happier than those who are unsatisfied with the economy; extrinsic personal values tend to reduce happiness (being rich, and seeking respect and admiration from others) while intrinsic values tend to increase happiness (being creative, helping others; seeking fun and pleasure; following traditions and customs).

Focussing now on the effect that country dummy variables have on the outcome when the United Kingdom serves as the reference category. In round 3 (2006) of the survey, no country, when compared to the United Kingdom, reported a statistically significant negative effect on happiness. Conversely, eight of the thirteen European countries included in the model did show a positive and significant effect on happiness. Only Ireland, the Netherlands, Russian Federation and Slovenia did not produce a statistically significant impact on the outcome. Not included in the previous regression tables (Table's 8.6 - 8.8) was Spain, since Spain alone represents the South of Europe. However, as individual country's are considered in these models (Table 8.9), Spain is now included. The results show that compared to the UK sample population, those living in Spain were (on average) happier than their British counterparts. This effect was strongest in 2006 (beta = .38, $p<0.001$). The only other country in 2006 (round 3) that elicited a stronger effect on happiness (when compared to the UK) was Denmark (beta = .43, $p<0.001$). People in Poland in round 3 (2006) also reported (on average) a positive and significant effect on happiness scores (beta = .32, $p<0.001$), which exceeded even Norway and Sweden's positive coefficient.

These results so far suggest that two years prior to the year of the financial crisis, people in the United Kingdom were not to a statistically significant degree, happier than the populations of many countries (at least those included in this analysis). However, when the

same countries are considered in 2008 (round 4), the year of the financial crisis, there are only two countries, Denmark and Spain, that show a positive effect on the outcome (beta = .30, p<0.001) and (beta = .23, p<0.01) respectively. Where France previously (in 2006) showed a significant positive association with happiness, in 2008, this has reversed to show a statistically significant negative effect (beta = -.15, p<0.05). In 2008, Russia and Slovenia showed a significant negative association with happiness, with the former eliciting the largest negative effect of any country, (beta = -53, p<0.001).

Table 5.8 Linear Regression models with robust std.errors: Happiness in European countries by year. UK serves as reference category

Happy (Likert Scale)	Model 16 (2006)		Model 17 (2008)		Model 18 (2010)	
	Coef.	(se)	Coef.	(se)	Coef.	(se)
Female	0.16***	(0.05)	0.18***	(0.04)	0.20***	(0.04)
.Satisfied with present state of country's economy	0.60***	(0.05)	0.56***	(0.05)	0.74***	(0.05)
Creative	0.07	(0.06)	0.20***	(0.05)	0.09	(0.06)
Materialistic/rich	-0.17**	(0.05)	-0.07	(0.05)	-0.14**	(0.05)
Treat people equally	0.14	(0.08)	0.07	(0.08)	0.21*	(0.09)
.Show abilities and be admired	-0.07	(0.05)	-0.05	(0.05)	-0.11*	(0.05)
.Be free and make own decisions	-0.06**	(0.02)	-0.02	(0.02)	-0.03	(0.02)
.Help people and care for others well-being	0.21**	(0.08)	0.18*	(0.07)	0.16	(0.09)
Respect from others	-0.07	(0.05)	-0.04	(0.04)	-0.05	(0.05)
.Follow traditions and customs	0.06	(0.05)	0.04	(0.05)	0.12*	(0.05)
.Seek fun and pleasure (hedonic)	0.23***	(0.05)	0.25***	(0.05)	0.21***	(0.05)
United Kingdom (rc)	0.00	-	0.00	-	0.00	-
Belgium	0.19**	(0.07)	-0.07	(0.07)	0.10	(0.07)
Switzerland	0.29***	(0.08)	-0.13	(0.08)	-0.03	(0.07)
Germany	0.07	(0.07)	-0.13	(0.07)	-0.07	(0.07)
Denmark	0.43***	(0.07)	0.30***	(0.07)	0.27***	(0.07)
Spain	0.38***	(0.08)	0.23**	(0.07)	0.30***	(0.07)
France	0.15*	(0.08)	-0.15*	(0.07)	-0.15	(0.08)
Ireland	0.00	(0.09)	-0.08	(0.08)	-0.48***	(0.09)
Netherlands	0.06	(0.07)	-0.12	(0.07)	-0.06	(0.07)
Norway	0.26***	(0.08)	0.07	(0.07)	-0.09	(0.08)
Poland	0.32**	(0.10)	-0.00	(0.08)	-0.04	(0.08)
Russian Federation	-0.04	(0.12)	-0.53***	(0.10)	-0.58***	(0.09)
Sweden	0.29***	(0.07)	-0.04	(0.07)	-0.13	(0.07)
Slovenia	0.07	(0.09)	-0.26**	(0.09)	-0.04	(0.09)
Constant	8.74***	(0.33)	8.45***	(0.30)	8.43***	(0.33)
N	13932		15463		14893	
ll	-26600.01		-29504.89		-28329.73	
bic	53610.32		59424.57		57072.62	
R2	0.28		0.25		0.27	

* p<0.05, ** p<0.01, *** p<0.001

Design weight (DWEIGHT) applied.
Source ESS Rounds 3 (2006), 4 (2008) & 5 (2008)

Looking at the last column in Table 5.8, round 5 (2010); Denmark and Spain remain the only countries that have consistently been associated with producing a positive and significant effect on happiness in each of the three rounds. However, where Denmark reported a slightly higher coefficient in 2006 and 2008, in 2010, Spain produces the highest positive effect (beta = .30, $p<0.001$) compared to Denmark in 2010 (beta = .27, $p<0.001$). There are only two other countries that elicit a significant, and in both instances negative effect (reducing happiness), Ireland and Russian Federation. While Russia was associated with a negative effect in 2008, in 2010 this has increased again, albeit slightly (beta = -.58, $p<0.001$). While the average happiness scores of the population of Ireland was found not to be significantly different from that of the United Kingdom in rounds 3 or 4 (2006 and 2008 respectively), in round 5 (2010), living in Ireland results in a relatively large significant decrease in the happiness coefficient (beta = -.48, $p<0.001$). None of the other remaining countries were reported to be significantly different from the United Kingdom.

7.8 Summary

Across European countries, average patterns of well-being, and average patterns in the influence of socio-demographic and economic factors upon happiness, do not change markedly over the period 2006-10, but there are considerable variations in survey response patterns from country to country. In general, national variations are consistent with findings from previous literature: for instance, Scandinavian countries show patterns of more favourable happiness, and Eastern European countries show the least favourable profiles; these patterns are consistent with and without additional controls for other explanatory influences. A positive correlation is also found between satisfaction with the economy and subjective happiness, and the strength of this correlation varies slightly over time; however, other evidence of the possible effect of the 2007 financial crisis upon subjective happiness is ambiguous. Also considered in this chapter was the impact that personal values had on happiness alongside one's satisfaction with their country's present state of the economy.

Chapter 8 - Discussion and Conclusion

8. Introduction

The aim of this research is to explore the complexity of mental health and its relation to a range of socio-demographic and socio-economic factors. After reviewing potential data resources and available measures for conceptualising mental health and well-being, analytic chapters evaluate four key areas of influence for mental health. The first (Chapter 4) explores patterns and variation in mental health outcomes in relation to a variety of socio-demographic and socio-economic indicators including gender, age, educational attainment, labour-force activity, subjective health status and income. Secondly (Chapter 5), labour-market status transitions and the impact they have on psychological well-being are explored. Thirdly (Chapter 6), the relationship between mental health and fine-grained occupational groups are explored, with a focus on identifying occupations with increased and decreased prevalence of minor psychiatric morbidity. Fourthly (Chapter 7), differences in the way happiness relates to personal values and key socio-demographic and socio-economic factors across several European countries are examined.

Three datasets are used to explore these topics; all 18 waves (1991-2008) of the British Household Panel Study (BHPS) (University of Essex, 2010); the 2007 dataset of the Adult Psychiatric Morbidity Survey (APMS) (McManus et al. 2009); and three rounds of the European Social Survey (ESS) (ESS, 2006; 2008; 2010). The BHPS is a panel dataset and therefore allows for longitudinal analysis to be conducted. The APMS is a repeated cross-sectional survey in which diagnostic measurement tools for exploring psychiatric morbidity are available. The ESS is also a repeated cross-sectional survey which is carried out across several European countries. Mental well-being is operationalised through the use of four measures. The General Health Questionnaire (GHQ-12) (Goldberg and Williams, 1998), which provides a continuous measure of psychological distress, where higher GHQ-12 scores are indicative of higher levels of distress. A binary measure is also derived from the GHQ-12, where through the application of a threshold, ‘cases’ (people with potential minor psychiatric morbidity) are distinguished from people who are ‘non-cases’. It should be noted however that the GHQ-12 is not a diagnostic instrument. The

Revised Clinical Interview Schedule (CIS-R) (Lewis et al. 1992) is a diagnostic measure and provides a measure that can identify the presence of minor psychiatric morbidity. The fourth measure that is employed within this thesis is the single-item question, '*how happy do you feel?'* This measure is used in Chapter 7. The rating scale runs from 0 to 10 with higher scores being indicative of increased levels of happiness.

8.1 Summary of key findings from thesis - Gender

This research has identified several key factors and influences for mental health and many well-known patterns and relationships are confirmed through longitudinal and cross-sectional analyses. Mental health is indeed influenced by a variety of socio-demographic, socio-economic and health related factors which are often interrelated and operate at different stages in people's lives (Andres, 2004; Fryers et al. 2005). A consistent finding throughout the thesis and one that is reported in numerous other studies is that women have poorer mental health outcomes than men (Brown and Harris, 1978; Klose and Jacobi, 2004; Van de Velde et al. 2010; Rosenfield and Mouzon, 2013). This is demonstrated longitudinally in Chapters 4 and 5; whenever gender (*FEM*) is included in *any* of the models presented in these chapters, GHQ-12 scores are significantly increased and the log of the odds of being a 'case' also increases. This relationship is also confirmed in Chapter 6, where almost twice the percentage of females (16 percent) to males (9 percent) have a CIS-R score that exceeds the clinical threshold for which minor psychiatric morbidity is probable. However, in Chapter 7, when happiness is the outcome, women consistently score higher than men, indicating somewhat paradoxically that they are 'happier' than their male counterparts. This finding is also reported in other studies which have considered levels of happiness by gender across countries (Blanchflower and Oswald, 2008; Georgellis et al. 2009; Graham et al. 2012; Steptoe et al. 2014).

Just as mental health is unequally distributed, so too are the determinants and influences for mental health unequally distributed (Graham, 2004). This unequal distribution of risk and protective factors has been used to explain why disparity in mental health outcomes between men and women exist and indeed persist. Women are more likely to be exposed to more risk factors for psychiatric morbidity than men; poverty, low-income, precarious

occupational roles, domestic violence, single-parenthood and other gendered risk factors for example (Macintyre et al. 1996; Piccinelli and Wilkinson, 2000).

However, it is not simply the case that women are more likely than men to experience *any* mental disorder. Many studies have shown that women have higher prevalence of depression and most affective and non-affective psychosis while men have higher rates of alcohol, substance use and personality disorder (Astbury, 2001; Rosenfield and Mouzon, 2013). Other explanation include potential reporting biases, where men underreport symptoms associated with psychological distress and are less likely seek help, relative to women (Afifi, 2007; Macintyre et al. 1999; Matud, 2004). Van de Velde et al. (2010) found that while women reported higher levels of depression than men all 23 countries they considered, socio-economic and family related factors moderate the relationship between gender and depression. Moreover, socioeconomic factors had the strongest association with prevalence of depression in both men *and* women (Van de Velde et al. 2010: 305).

8.1.1 Age effect and mental health

Another key finding that emerges from this research concerns the non-linear relationship that exists between age and mental health. This is commonly referred to as the U-shape relationship between age and well-being, although due to the scoring of the GHQ-12 applied in this thesis, it is actually an 'n' shaped curve. This relationship is confirmed in almost all models presented in this thesis when age is included as a control. The quadratic function of age is also significantly associated with each of the measures for mental health (GHQ Likert and caseness versions, CIS-R and happiness). The relationship between age, its quadratic function, and mental well-being indicates that as people get older their mental health deteriorates, reaching a low in middle-age (approximately 45-55 years old), before improving as they progress through the life-course. Again, this finding is replicated in numerous studies. (Andres, 2004; Bebbington et al. 1998; Blanchflower and Oswald, 2008; Steptoe et al. 2014). Andres (2004) for example, used the BHPS to explore determinants of self-reported mental health and confirmed this non-linear U-shaped relationship between age and well-being. Blanchflower and Oswald (2008) using samples from the USA and Europe also found in favour of this non-linear U-shaped relationship. Steptoe et al (2014)

reported that the U-shaped relationship between age and well-being was present in English speaking high-income nations, but in Eastern European countries mental well-being continued to deteriorate as people aged (Steptoe et al. 2014: 9968).

It is not possible based on this research to distinguish between age, period and cohort effects. Although age follows an inverse U-shape trajectory in the models presented in this thesis, it is not possible to claim that people who are middle aged are more likely to report higher levels of psychological distress than younger or older people simply due to their chronological age (age effect) (Bell, 2014; Keyes et al. 2014). Such findings between age and mental health outcomes may be erroneous and are result of confounding cohort processes (Bell, 2014: 21).

8.1.2 Labour-market transitions and impact on mental health

The relationship between labour-force activity and mental well-being is introduced in Chapter 4, where it is clear that GHQ-12 scores are lowest for people who are employed, highest for the unemployed and long-term sick, and intermediate for those in family-care roles and retirement. Simply stated, people who are unemployed have significantly lower levels of psychological well-being and are more likely to experience psychiatric morbidity than people who are employed. Many studies confirm the detrimental effect on mental health and well-being unemployment incurs (Bartley, 1994; Bartley et al. 2005; Clark and Oswald, 1994; Fryers et al. 2005). However, the unemployed are not one homogenous group and job-loss and spells of unemployment can affect different people in different ways. For example, Artazcoz et al. (2004) found that unemployment was more damaging for married men's mental well-being than it was for men who were not married. Klose and Jacobi (2004) on the other hand provided evidence showing that not being married and being unemployed were associated with an increased risk in psychiatric morbidity in both men and women, although this effect was strongest in the former. Andersen (2009) found that the negative impact on psychological well-being associated with losing one's job was worse for people in the middle-classes than it was for their counterparts in less favourable social class positions. In general however, people who are unemployed tend to have poorer

levels of mental well-being and higher prevalence of psychiatric morbidity than people who are employed.

Chapter 5 expands upon the initial observations and results presented in the preceding chapter and explores in greater detail the impact transitions in labour-market status have on mental health. The results (see Table 3.12 and 3.14) show that of all possible labour-market transitions, remaining employed for successive years is associated with the lowest GHQ-12 scores, while transitioning from employment into unemployment or long-term sick increases GHQ-12 scores. For females, moving into family-care roles from employment significantly increases GHQ-12 scores. Longitudinal analysis confirms that men are more psychologically distressed as a result of transitions into unemployment than females, which is consistent with the results from similar analyses (Flint et al. 2013; Paul and Moser, 2009). The reverse transition of moving into employment from a state of unemployment improves mental well-being, although in the analysis presented in this thesis, the reductions in GHQ-12 scores are not significant in any of the models. A significant reduction in GHQ-12 is reported for females transitioning from family care roles into employment, and for men moving from long-term sickness into employment. This research also shows however, that the the improvement in mental well-being that transitions from forms of non-employment into employment elicit, are not as large as the negative (detrimental) impact that transitions from employment into various forms of non-employment incur.

A weakness of this thesis is that there is no way of knowing the timing or indeed number of labour-market transitions that respondents have undergone in the BHPS sample. I have included a lagged dependent variable to account for previous caseness status to control for instances when people were actually a case prior to a specific transition. Flint et al (2013) also used this strategy. However, it is not possible from my models alone to be sure when the transition in labour-market status actually took place and so cannot therefore be certain if changes in caseness or GHQ-12 are directly linked with the labour-market transition. Other important factors such as the national unemployment rate, or the social class of individual's who undergo labour-market transitions are not included in the analysis

(Andersen, 2009). There is also a lack of cases/observations in many of the transition categories which limits the conclusions that can be drawn from analysis.

8.1.3 Gender disparity in mental health outcomes across occupations

In Chapter 6, gender differences in the prevalence of psychiatric morbidity across major and sub-major SOC 2000 groups are considered. Results show that females tend to have higher prevalence of mental disorder across occupational groups. Even in occupations that are considered favourable, such as corporate managers; 13 percent of females have probable psychiatric morbidity (Table 4.2) compared to 7 percent of men in the same occupational group (Table 4.1). Caring and personal service occupations are associated with high prevalence rates of psychiatric morbidity for females, while both male and female elementary admin and service workers report high prevalence rates. However, female science and technology workers have a 2 percent prevalence rate of psychiatric morbidity while men working in the same occupations have a 7 percent prevalence rate.

Other studies (Stansfeld et al. 2011; 2012) have found that psychosocial work characteristics are important factors in mediating the relationship between occupation, gender and mental health. However, no such measures have been included in this chapter which limits any conclusions that can be made about the patterns reported. It would also be wise to include information about occupations including the type of contract (temporary, permanent for example), hours worked, salary, prospects for promotion and security for example. Stansfeld and Candy (2006) for example, found that combinations of high demands and low decision latitude, and high effort/low reward was a risk factor for psychiatric morbidity across occupations. A strength of the analysis in this chapter however is that men and women are considered separately across each of the occupational groups which allows for comparisons within as well as between occupations and gender to be considered.

In Chapter 7, happiness across 14 European countries and its relationship with personal values and socio-demographic and socio-economic factors is considered. The results (Table 5.1) show that in general and across three rounds of data (2006, 2008 and 2010),

Eastern European countries including Russia, Poland and Slovenia tend to report the lowest levels of happiness. Nordic countries including Denmark, Sweden and Norway have the highest levels of happiness. Switzerland also consistently reports high levels of subjective happiness. Western nations such as the UK, Germany, Ireland, Netherlands, and Belgium typically report intermediate levels of happiness relative to Eastern and Nordic countries. These results somewhat mirror those Steptoe et al. (2014) reported, where mental well-being was poorer in Eastern European countries compared to Western nations. As was previously noted, women report statistically significant higher levels of happiness than their male counterparts (with the exception of Eastern European women in 2006, Table 5.6). With regards to the personal values component of the research, results are mixed. Being materialistic (intrinsic value) is associated with lowering levels of happiness across all European regions in at least one round of the surveys. Helping people and caring for others' well-being (extrinsic value) is associated with increasing levels of happiness in each of the European regions in at least one or more rounds the survey (ESS). Being 'satisfied with the present state of a specific country's economy' was associated with a significant increase in levels of happiness, with the largest effect being reported for Nordic countries (Table 5.6).

Also demonstrated in this thesis was an inverse relationship between GHQ-12 score and household monthly income, suggesting that money actually does buy happiness, at least in the context of this thesis. People who financially 'struggled' to get by had significantly higher GHQ-12 scores and were much more likely than people who were financially 'comfortable' to have minor psychiatric morbidity. Being uncoupled either through divorce or widowhood increases levels of psychological distress. Educational attainment for the most part did not influence GHQ-12 scores. Educational attainment showed a weak and for the most part non-significant relationship to mental health and GHQ-12 scores or caseness. A consistent finding throughout the research was that people who rated their subjective health as good or excellent, were also more likely to have low GHQ-12 scores.

8.2 Strengths and limitations of thesis

A major limitation of this thesis is a lack of cases and observations across key measures and indicators. A relatively small number of respondents are unemployed in the BHPS and APMS. This is also a feature of Chapter 5, where many potential labour-market transitions have very few cases. As noted in the sections above; there is no information concerning the timing and/or frequency of employment transitions. A lagged dependent variable (previous caseness status) is included in the analysis (in Chapter 5) to attempt to deal with this, however, it is still not possible to be sure that changes in GHQ or caseness are the direct result of a recorded transition in labour market status. However, few studies have considered the variety of labour-market transitions that have been outlined in this thesis, where there is a tendency to focus on transitions into unemployment. Much analysis is conducted separately for men and women, allowing for gender disparities within and between occupations to be conducted. A lack of information (in Chapter 6) about job types, contracts, hours, salary, environment, support available, and other potential indicators is another limitation of this research.

8.3 Implications for research

This thesis demonstrates that mental health and well-being is influenced by a variety of social, economic and health related variables. Females consistently report higher GHQ-12 scores than their male counterparts; younger and older age groups have more favourable mental well-being than middle aged respondents; more advantaged educational and economic circumstances are also associated with more favourable mental well-being; and subjective health status is highly correlated with mental well-being. There is also evidence that patterns of social influences upon mental health can work in different ways in different scenarios.

8.4 Conclusion

This thesis provides a wide-ranging review of how social factors influence mental health using a series of rich contemporary survey datasets. The statistical analysis of survey data

confirms that the influences upon psychiatric morbidity and subject well-being are complex. Different choices over the functional form of key measures, such as age, occupation and family circumstances are all shown to have an influence upon conclusions drawn, and there is evidence that patterns of social influences upon mental health can work in different ways in different scenarios. Previous analyses may sometimes have been compromised by using insufficient detail in key socio-economic measures, and/or by having insufficient sample power (due to low numbers of cases) to adequately establish the relationship with fine-grained differences in social circumstances. Promising opportunities for improved understanding of social influences upon mental health lie with further explorations of both micro-data resources, and statistical analytical techniques, to more effectively summarise influences upon mental well-being.

Bibliography

Acheson, D. Independent Inquiry into Inequalities in Health Report. The Stationary Office, 1998.

Adler, N.E., Boyce, T., Chesney, M.A., Cohen, S., Folkman, S., Kahn, R.L. and Syme, L.S. (1994). Socioeconomic status and health: The challenge of the gradient. *American Psychologist.* 49(1), 15-24.

Afifi, M. (2007). Gender differences in mental health. *Singapore Medical Journal.* 48(5), 385-391.

Allport, G.W. (1961). *Pattern and growth in personality.* New York: Holt, Rinehart & Winston.

Andersen, S.H. (2009). Unemployment and subjective well-being: A question of class? *Work and Occupations.* 36(1), 3-25.

Aneshensel, C.S., Rutter, C.M. and Lachenbruch, P.A. (1991). Social Structures, Stress, and Mental Health: Competing Conceptual and Analytic Models. *American Sociological Review.* 56(2), 166-178.

Aneshensel, C.S., Phelan, J.C. and Bierman, A. (Eds) (2013). *Handbook of the Sociology of Mental Health.* New York: Springer.

Andres, A.R. (2004). Determinants of self-reported mental health using the British Household Panel Survey. *The Journal of Mental Health Policy and Economics.* 7, 99-106.

American Psychiatric Association (1952). *Diagnostic and statistical manual of mental disorders* (1st Edition). Washington, DC: American Psychiatric Association.

American Psychiatric Association (1968). *Diagnostic and statistical manual of mental disorders* (2nd Edition). Washington, DC: American Psychiatric Association.

American Psychiatric Association (1980). *Diagnostic and statistical manual of mental disorders* (3rd Edition). Arlington, VA: American Psychiatric Association.

American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (4th Edition). Arlington, VA: American Psychiatric Association.

American Psychiatric Association (2009). ICD vs. DSM. *APA.* October 2009, 40(9), 63. http://www.apa.org/monitor/2009/10/icd-dsm.aspx [accessed 3.8.2015].

Artazcoz, L., Benach, J., Borrell, C. and Cortes, I. (2004). Unemployment and mental health: Understanding the interactions among gender, family roles, and social class. *American Journal of Public Health.* 94(1), 82-88.

Astbury, J. (2001). *Gender disparities in mental health.* In: Mental health. Ministerial Round Tables 2001, 54th World Health Assemble, 2001, WHO. Geneva, Switzerland. http://www.who.int/mental_health/media/en/242.pdf

Bagby, R. M., Ryder, A. G., Schuller, D. R., & Marshall, B. M. (2004). The Hamilton Depression Rating Scale: Has the Gold Standard Become a Lead Weight? *Americal Journal of Psychiatry, 161*, 2163-2177.

Bartley, M. (1994). Unemployment and ill health: understanding the relationship. *Journal of Epidemiology and Community Health.* 48, 333-337.

Bartley, M. (2012). Explaining health inequality: Evidence from the UK. *Social Science and Medicine.* 74, 658-660.

Bartley, M., Blane, D. and Davey-Smith, G. (1998). Introduction: Beyond the Black Report. *Sociology of Health and Illness.* 20(5), 563-577.

Bartley, M., Sacker, A., Schoon, I., Kelly, M.P. and Carmona, C. (2005). *Work, non-work, job satisfaction and psychological health: Evidence Review.* 1st Edition, March 2005. NHS. Health Development Agency.

Bebbington, P.E. (1998). Sex and Depression. *Psychological Medicine.* 28, 1-8.

Bell, A. (2014). Life-course and cohort trajectories of mental health in the UK, 1991-2008 - A multilevel age-period-cohort analysis. *Social Science and Medicine.* 120, 21-31.

Bebbington, P. (1992). Welcome to ICD-10. *Social Psychiatry and Psychiatric Epidemiology.* 27, 255-257.

Bebbington, P.E., Dunn, G., Jenkins, R., Lewis, G., Brugha, T., Farrell, M. and Meltzer, H. (1998). The influence of age and sex on the prevalence of depressive conditions: report from the National Survey of Psychiatric Morbidity. *Psychological Medicine.* 28, 9-19.

Berrington, A., Hu, Y., Ramirez-Ducoing, K. and Smith, P. (2006). *Multilevel Modelling of Repeated Ordinal Measures: An application to attitudes to divorce.* ESRC Working Paper No 26. pp. 1-26.

Berrington, A., Smith, W.F. and Stugis, P. (2006). *An overview of methods for the analysis of panel data.* ESRC NCRM Methods Review Papers NCRM/007. pp. 1-57.

Berthoud, R.G., Modood, T., Smith, P., Prior, G., 1997, *Fourth National Survey of Ethnic Minorities, 1993-1994*, [data collection], UK Data Service, Accessed 26 May 2016, SN: 3685, http://dx.doi.org/10.5255/UKDA-SN-3685-1

Black, D., Morris, J., Smith, C. and Townsend, P. (1980). *Inequalities in health: Report of a Research Working Group*. London: Department of Health and Social Security, 1980.

Blanchflower, D.G. (2001). Unemployment, Well-Being, and Wage Curves in Eastern and Central Europe. *Journal of the Japanese and International Economies.* 15, 364-402.

Blanchflower, D.G. and Oswald, A. (2008). Is well-being U-shaped over the life cycle? *Social Science and Medicine.* 66, 1733-1749.

Blane, D., Davey-Smith, G. and Bartley, M. (1993). Social selection: what does it contribute to social class differences in health? *Sociology of Health and Illness.* 15(1), 1-15.

Blane, D. (1985). An assessment of the Black Report's 'explanations of health inequalities'. *Sociology of Health and Illness.* 7 (3), 423-445.

Blane, D. (2006) Commentary: The place in life course research of validated measures of socioeconomic position. *International Journal of Epidemiology.* 35, 139-140

Blashfield, R.K., Sprock, J. and Fuller, A.K. (1990). Suggested guidelines for including or excluding categories in the DSM-IV. *Comprehensive Psychiatry.* 31(1), 15-19.

Broom, D.H., D'Souza, R.M., Strazdins, L., Butterworth, P., Parslow, R. and Rodgers, B. (2006). The lesser evil: Bad jobs or unemployment? A survey of mid-aged Australians. *Social Science and Medicine.* 63, 575-586.

Brown, G.W. and Harris, T.O. (1978). *Social origins of depression: A study of psychiatric disorder in women.* London: Tavistock.

Brugha, T.S., Bebbington, P.E. and Jenkins, R. (1999a). A difference that matters: comparisons of structured and semi-structured diagnostic interviews of adults in the general population. *Psychological Medicine.* 29, 1013-1020.

Brugha, T.S., Bebbington, P.E. and Jenkins, R. et al. (1999b). Cross validation of a household population survey diagnostic interview: a comparison of CIS-R with SCAN ICD-10 diagnostic categories. *Psychological Medicine.* 29, 1029-1042.

Clark, A.E. (2003). Unemployment as a social norm: Psychological evidence from panel data. *Journal of Labour Economics.* 21(2), 323-351.

Clark, A.E. and Oswald, A.J. (1994). Unhappiness and Unemployment. *The Economic Journal.* 104(424), 648-659.

Cooper, C., Spiers, N., Livingston, G., Jenkins, R., Meltzer, H., Brugha, T., McManus, S., Weich, S., and Bebbington, P. (2013). Ethnic inequalities in the use of health services for common mental disorders in England. *Social Psychiatric Epidemiology.* 48, 685-692.

Crawford, J.R. and Henry, J.D. (2004). The positive and negative affect schedule (PANAS): Construct validity, measurement properties and normative data in a large non-clinical sample. *British Journal of Clinical Psychology.* 43(3), 245-265.

CSDH (2008). *Closing the gap in a generation: health equity through action on the social determinants of health. Final Report of the Commission on Social Determinants of Health.* Geneva, World Health Organisation.

Davidson, R., Kitzinger, J. and Hunt, K. (2006). The wealthy get healthy, the poor get poorly? Lay perceptions of health inequalities. *Social Science and Medicine.* 62, 2171-2182.

Deaton, A. (2008). Income, Health and Well-Being around the World: Evidence from the Gallup World Poll. *Journal of Economic Perspectives.* 22(2), 53-72.

Deci, L.E. and Ryan, R.M. (2000). The "What" and "Why" of Goal Pursuits: Human needs and the self-determination of behaviour. *Psychological Inquiry.* 11(4), 227-268.

Deci, L.E. and Ryan, R.M. (2006). Hedonia, Eudaimonia, and Well-Being: An Introduction. *Journal of Happiness Studies.* 9, 1-11.

Delhey, J. (2010). From Materialist to Post-Materialist Happiness? National Affluence and Determinants of Life Satisfaction in Cross-National Perspective. *Social Indicators Research.* 97, 65-84.

Department of Health (DoH) (2011) *No health without mental health: A cross-government mental health outcomes strategy for people of all ages.* Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/213761/dh_124058.pdf (Accessed 6th June 2012).

Diener, E. (1984). Subjective well-being. *Psychological Bulletin.* 95, 542-575.

Diener, E., Lucas, R.E. and Scollon, C.N. (2006). Beyond the Hedonic Treadmill: Revising the adaptation theory of well-being. *American Psychological Association.* 61(4), 305-314.

Dolan, P., Peasgood, T., and White, M. (2008). Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective well-being. *Journal of Economic Psychology,* 29, 94-122.

Dolan, P., Layard, R. and Metcalfe, R. (2011). *Measuring Subjective Well-being for Public Policy.* Office for National Statistics, February 2011: Crown Copyright.

Easterlin, R.A. (1974). *Does economic growth improve the human lot? Some empirical evidence.* In: David, P.A. and Reder, M.W. (Eds.) *Nations and Households in Economic Growth.* Academic Press: New York. pp. 89-125.

Easterlin, R.A. (2001). Income and Happiness: Towards a Unified Theory. *The Economic Journal.* 111(473), 465-484.

Easterlin, R.A. (2013). Happiness and economic growth: The evidence. *Institute for the Study of Labour.* Discussion Paper No. 7187. January 2013.

Ellaway, A., Macintyre, S. and Kearns, A. (2001). Perceptions of Place and Health in Socially Contrasting Neighbourhoods. *Urban Studies.* 38(12), 2299-2316.

Enders, C.K. and Tofighi, D. (2007). Centering Predictor Variables in Cross-Sectional Multilevel Models: A new look at an old issue. *Psychological Methods.* 12(2), 121-138.

Erikson, E. (1959). Identity and the life cycle. *Psychological Issues.* 1, 18-164.

Esping-Anderesen, G. (1990). *Three Worlds of Welfare Capitalism.* Princeton, NJ: Princeton University Press.

European Social Survey Round 3 Data (2006). Data file edition 3.5. Norwegian Social Science Data Service, Norway - Data Archive and distributor of ESS data.

European Social Survey Round 4 Data (2008). Data file edition 4.3. Norwegian Social Science Data Service, Norway - Data Archive and distributor of ESS data.

European Social Survey Round 5 Data (2010). Data file edition 3.2. Norwegian Social Science Data Service, Norway - Data Archive and distributor of ESS data.

Ferrer-i-Carbonell, A. (2005). Income and well-being: an empirical analysis of the comparison income effect. *Journal of Public Economics,* 89, 997-1019.

First, M.B., Spitzer, R.L., Gibbon, M. and Williams, J.B.W. (1995). The Structured Clinical Interview for DSM-III-R Personality Disroders (SCID-II). Part I: Description. *Journal of Personality Disorders.* 9(2), 83-91.

First, M.B., Spitzer, R.L., Gibbon, M. and Williams, J.B.W. (1996). *Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Clinical Version* (SCID-CV). Washington, D.C.: American Psychiatric Press, Inc. 1996.

First, M.B. Gibbon, M., Spitzer, R.L., Williams, J.B.W. and Benjamin, L.S. (1997). *Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II).* Washington D.C.: Americal Psychiatric Press, Inc. 1997

First, M.B., Spitzer, R.L., Gibbon, M. and Williams, J.B.W. (2002a). *Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Patient Edition* (SCID-I/P) New York: Biometrics Research, New York State Psychiatric Institute, November 2002.

First, M.B., Spitzer, R.L., Gibbon, M. and Williams, J.B.W. (2002b). *Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Non-Patient Edition* (SCID-I/NP) New York: Biometrics Research, New York State Psychiatric Institute, November 2002.

First, M.B., Spitzer, R.L., Gibbon, M. and Williams, J.B.W. (2002c). *Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Patient Edition With Psychotic Screen* (SCID-I/P W/ PSY SCREEN) New York: Biometrics Research, New York State Psychiatric Institute, November 2002.

First, M.B., Williams, J.B.W., Spitzer, R.L. and Gibbon, M. (2007). *Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Clinical Trials Version* (SCID-CT). New York: Biometrics Research, New York State Psychiatric Institute, 2007.

Fitzpatrick, R., Kumar, S., Nkansa-Dwamena, O. and Thorne, L. (2014). *Ethnic Inequalities in Mental Health: Promoting Lasting Positive Change.* Report of findings to LankellyChase Foundation, Mind, The Afiya Trust and Centre for Mental Health. Confluence Partnerships, Feb (2014).

Flint, E., Bartley, M., Shelton, N. and Sacker, A. (2013). Do labour market status transitions predict changes in psychological well-being? *Journal of Epidemiology and Community Health.* 67(9), 796-802.

Fox, K.R. (1999). The Influence of Physical Activity on Mental Well-Being. *Public Health Nutrition.* 2(3a), 411-418

Fryers, T., Melzer, D., Jenkins, R. and Brugha, T. (2005). The distribution of the common mental disorders: social inequalities in Europe. *Clinical Practice and Epidemiology in Mental Health.* 1(14), 1-14.

Fryers, T. and Brugha, T. (2015). Social Inequalities. *Journal of Epidemiology.* 1(1), 1-19.

Fryers, T., Melzer, D. and Jenkins, R. (2003). Social inequalities and the common mental disorders: A systematic review of the evidence. *Social Psychiatry and Psychiatric Epidemiology.* 38, 229-237.

Georgellis, Y., Tsitsianis, N. and Yin, P.Y. (2009). Personal Values as Mitigating Factors in the Link Between Income and Life Satisfaction: Evidence from the European Social Survey. *Social Indicators Research.* 91, 329-344.

Goldberg, D.P., Cooper, B., Eastwood, M.R., Kedward, H.B. and Shepherd, M. (1970). A standardized Psychiatric Interview for use in Community Surveys. *British Journal of Preventive and Social Medicine.* 24, 18-23.

Goldberg, D. and Huxley, P. (1992). *Common Mental Disorders: A Bio-Social Model.* London: Tavistock.

Goldberg, D.P., Oldehinkel, T. and Ormel, J. (1998). Why GHQ threshold varies from one place to another. *Psychological Medicine.* 28(4), 915-921.

Goldberg, D.P. and Williams, P.A. (1988) *A Users guide to the General Health Questionnaire.* Basingstoke NFER-Nelson.

Goldie, I., Dowds, J., and O'Sullivan, C. (2011). *Starting Today - Background Paper 3: Mental Health and Inequalities*. The Mental Health Foundation. pp.1-11.

Goldman, N. (2001). Social Inequalities in health: disentangling the underlying mechanisms. *Annals of the New York Academy of Sciences.* 954, 118-139.

Goldstein, H. (2011). *Multilevel Statistical Models, 4th Edition.* Chichester: J Wiley and Sons.

Goodwin, L., Ben-Zion, I., Fear, N.T., Hotopf, M., Stansfeld, S.A. and Wessely, S. (2013). Are reports of psychological stress higher in occupational studies? A systematic review across occupational and population based studies. *PLoS ONE.* 8(11), 1-22.

Graham, C. and Chattopadhyay, S. (2012). *Gender and Well-Being around the World.* Global Economy and Development at Brookings: Washington.

Graham, H. (2004). Social Determinants and Their Unequal Distribution: Clarifying Policy Understanding. *The Milbank Quarterly.* 82(1), 101-124

Halliwell, E., Main, L. and Richardson, C. (2007) *The Fundamental Facts: The latest facts and figures on mental health.* Mental Health Foundation, 2007.

Hankins, M. (2008). The reliability of the twelve-item general health questionnaire (GHQ-12) under realistic assumptions. *BMC Public Health.* 8, 355-361)

Hamilton, M. (1960). A rating scale for depression. *Journal of Neurology, Neurosurgery and Psychiatry.* 23, 56-62.

Hayo, B. (2007). Happiness in transition: An empirical study on Eastern Europe. *Economic Systems.* 31, 204-221.

Health and Safety Executive (HSE) (2008). *Working Together to Reduce Stress at Work: A guide for employees,* INDG424 HSE Books, 2008. www.hse.gov.uk/pubns/indg424.pdf.

Holland, P., Berney, L., Blane,D. and Smith, G.D. (2000). Life Course Influences on health in early old age. *ESRC Health and Variations Programme.* Issue 6. September 2000.

Horowitz, A.V. (2002). *Creating Mental Illness.* Chicago: University of Chicago.

Hox, J. (2002). *Multilevel Analysis: Techniques and Applications.* Lawrence Erlbaum Associates, Publishers: London.

Jahoda, M. (1958). *Current concepts of positive mental health.* New York: Basic Books.

Johnson, J.V. and Hall, E.M. (1988). Job strain, workplace social support, and cardiovascular disease. A cross-sectional study of a random sample of the Swedish Working population. *American Journal of Public Health.* 78, 1336-1342.

Jung, C.G. (1933). *Modern man in search of a soul* (W.S. Dell & C.F. Baynes, Trans). New York: Harcourt, Brace and World.

Kahneman, D., Diener, E. and Schwarz, N. (Eds.) (1999). *Well-being: Foundations of hedonic psychology.* New York: Russell Sage Foundation Press.

Karasek, R.A. (1979). Job demands, job decision latitude and mental strain. Implications for job redesign. *Administrative Science Quarterly.* 24, 285-308.

Karasek, R.A. and Theorell, T. (1990). *Healthy Work. Stress, Productivity and the Reconstruction of Working Life.* New York: Basic Books.

Keating, F., Robertson, D. and Kotecha, N. (2003) *Ethnic Diversity and Mental Health in London: Recent Developments.* Kings Fund Working Paper, August 2003, London.

Kessler, R.C., Amminger, G.P., Aguilar-Gaxiola, S., Alonso, J., Lee, S. and Ustun, T.B. (2007). Age of onset of mental disorders: A review of recent literature. *Current Opinion in Psychiatry.* 20(4), 359-364.

Kessler, R.C. and Ustun, T.B. (2006). The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI).

Kessler, R.C., et al. (2004). The WHO World Mental Health Consortium: Prevalence, Severity, and Unmet Need for Treatment of Mental Disorders in the World Health Organization World Mental Health Surveys. *Journal of the American Medical Association (JAMA),* 291(21), 2581-2590.

Kessler, R.C., Aguilar-Gaxiola, S., Alonso, J., Chatterji, S., Lee, S., Ormel, J., Ustun, B. and Wang, P.S. (2009). The global burden of mental disorders: An update from the WHO World Mental Health (WMH) Surveys. *Epidemiology and Psychiatric Sciences,* 18(1), 23-33.

Kessler, R.C. (2010). *The Prevalence of Mental Illness.* pp. 1-19. In Scheid, T.L. and Brown, T.N. (Ed's) (2010). *A Handbook for the Study of Mental Health: Social Context, theories and systems, 2nd Edition.* New York: Cambridge University Press.

Keyes, C.L.M. (1998). Social well-being. *Social Psychology Quarterly.* 61, 121-140.

Keyes, C.L.M. (2002). The Mental Health Continuum: From Languishing to Flourishing in Life. *Journal of Health and Social Behaviour.* 43(2), 207-222.

Keyes, K.M., Nicholson, R., Kinley, J., Raposo, S., Stein, M.B., Goukldner, E.M. and Sareen, J. (2014). Age, period, and cohort effects in psychological distress in the United States and Canada. *American Journal of Epidemiology.* 179(10), 1216-1226.

Keyes, C.L.M., Shmotkin, D. and Ryff, C.D. (2002). Optimizing Well-Being: The empirical encounter of two traditions. *Journal of Personality and Social Psychology.* 82(6), 1007-1022.

Klose, M. and Jacobi, F. (2004). Can gender differences in the prevalence of mental disorders be explained by sociodemographic factors? *Archives of Women's Mental Health.* 7, 133-148.

Kocalevent, R-D., Hinz, A. and Brahler, E. (2013). Standardization of the depression screener Patient Health Questionnaire (PHQ-9) in the general population. *General Hospital Psychiatry.* 35, 551-555.

Kroenke, K. and Spitzer, R.L. (2002). The PHQ-9: A new depression and diagnostic severity measure. *Psychiatric Annals.* 32, 509-521.

Kroenke, K., Spitzer, R.L. and Williams, J.B. (2001). The PHQ-9: validity of a brief depression severity measure. *Journal of General Internal Medicine.* 16(9), 606-613.

Kroenke, K., Spitzer, R.L., Williams, J.B. and Lowe, B. (2010). The Patient Health Questionnaire Somatic, Anxiety, and Depressive Symptom Scale: a systematic review. *General Hospital Psychiatry.* 32(4), 345-359.

Lambert, P.S. (2006). *The British Household Panel Survey: An introduction to a longitudinal data resource. Working paper 2 of 'longitudinal data analysis for social science researchers', ESRC Researcher development initiative training programme.* ESRC.

Lambert, P.S. and Dougall, N. (2010). *e-Health Data Linkage.* University of Stirling: Nursing, Midwifery and Allied Health Professions Research. ESRC.

Lewis, G. and Araya, R. (2001). Classification, disability and the public health agenda. *British Medical Bulletin.* 57, 3-15.

Lewis, G., Pelosi, A.J., Araya, R. and Dunn, G. (1992). Measuring psychiatric disorder in the community: a standardized assessment for use by lay interviewers. *Psychological Medicine.* 22, 465-486.

Loranger, A.W., Susman, V.L., Oldham, J.M. and Russakoff, L.M. (1987). The Personality Disorder Examination: A preliminary report. *Journal of Personality Disorders.* 1, 1-13.

Loranger, A.W. (1988). *Personality Disorder Examination (PDE) Manual.* New York: D.V. Communications.

Loranger, A.W., Sartirius, N. and Janca, A. (1997). *Assessment and diagnosis of personality disorders: The International Personality Disorder Examination (IPDE).* New York: Cambridge University Press.

Lynch, J.W., Kaplan, G.A. and Salonen, J.T. (1997). Why do poor people behave poorly? Variation in adult health behaviours and psychosocial characteristics by stages of the socioeconomic lifecourse. *Social Science and Medicine.* 44(6), 809-819.

Mackenbach, J.P. (1994). The Epidemiologic Transition Theory. *Journal of Epidemiology and Community Health.* 48, 329-332.

Macintyre, S. (1997). The Black Report and Beyond, What are the Issues? *Social Science and Medicine.* 44(6), 723-745.

Macintyre, S., Hunt, K. and Sweeting, H. (1996). Gender differences in health: Are things really as simple as they seem? *Social Science and Medicine.* 42(4), 617-624.

Marchenko, Y. (2006). Estimating Variance Components in Stata. *The Stata Journal.* 6(1), 1-21.

Marmot, M. (2001a). From Black to Acheson: two decades of concern with inequalities in health. A celebration of the 90th birthday of Professor Jerry Morris. *International Journal of Epidemiology.* 30, 1165-1171.

Marmot, M. and Wilkinson, R.G. (2001). Psychosocial and material pathways in the relation between income inequality and health: a response to Lynch et al. *BMJ.* 322, 1233-1236.

Marmot, M., Ryff, C.D., Bumpass, L.L., Shipley, M. and Marks, N. (1997). Social inequalities in health: Next questions and converging evidence. *Social Science and Medicine.* 44(6), 901-910.

Marmot, M.G., Smith, G.D., Stansfeld, S., Patel, C., North, F., Head, J., White, I., Brunner, E. and Feeney, A. (1991). Health inequalities among British civil servants: the Whitehall II study. *Lancet.* 337(8754), 1387-1393.

Marshall, G. (1998). *A Dictionary of Sociology.* Oxford University Press.

Martin, A., Rief, W., Klaiberg, A. and Braehler, E. (2006). Validity of the Brief Patient Health Questionnaire Mood Scale (PHQ-9) in the General Population. *General Hospital Psychiatry.* 28, 71-77.

Maslow, A.H. (1958). *A Dynamic Theory of Human Motivation.* [In] Chalmers, S.L. and Manfred, D. (Eds) (1958). *Understanding Human Motivation.* (pp. 26-47). Cleveland, OH: Howard Allen Publishers.

Matud, M.P. (2004). Gender differences in stress and coping styles. *Personality and Individual Differences.* 37, 1401-1415.

Mayes, R. and Horowitz, A.V. (2005). DSM-III and the revolution in the classification of mental illness. *Journal of the History of the Behavioural Sciences.* 41(3), 249-267.

McCafferty, S., Doherty, T., Sinnott, R.O. and Watt, J. (2010). e-Infrastructures supporting research into depression, self-harm and suicide. *Phil. Trans. R. Soc. A.* 368, 3854-3858.

McCormick, T.H., Moussa, A., Ruf, J., DiPrete, T.A., Gelman, A., Tietler, J. and Zheng, T. (2013). A practical guide to measuring social structure using indirectly observed network data. *Journal of Statistical Theory and Practice.* 7(1), 120-132.

McKee-Ryan, F.M., Song, Z., Wanberg, C.R. and Kinicki, A.J. (2005). Psychological and Physical Well-Being During Unemployment: A Meta-Analytic Study. *Journal of Applied Psychology.* 90(1), 53-76.

McManus, S., Meltzer, H., Brugha, T., Bebbington, P. and Jenkins, R. (2009). *Adult Psychiatric Morbidity in England, 2007: Results of a Household Survey.* London: National Centre for Social Research.

Mental Health Foundation (2014) Black and Minority Ethnic Communities (Online) Available at: http://www.mentalhealth.org.uk/help-information/mental-health-a-z/B/BME-communities/ (Accessed 3rd Feb 2015).

Mental Health Network (2013). *E-mental health: What's all the fuss about?* Discussion Paper 12 January 2013, Issue 12. NHS Confederation.

Moller-Leimkuhler, A.M. (2003). The gender gap is suicide and premature death or: why are men so vulnerable? *Eur Arch Psychiatry Clin Neurosci.* 253, 1-8.

Murali, V. and Oyebode, F. (2004). Poverty, social inequality and mental health. *Advances in Psychiatric Treatment,* 10, 216-224.

Murphy, G.E. (1998). Why Women Are Less Likely Than Men to Commit Suicide. *Comprehensive Psychiatry.* 39(4), 165-175.

Murphy, G.C. and Athanasou, J.A. (1999). The effect of unemployment of mental health. *Journal of Occupational and Organizational Psychology.* 72, 83-99.

National Centre for Social Research, University of Leicester. (2011). *Adult Psychiatric Morbidity Survey, 2007. 3rd Edition.* UK Data Service. SN: 6379, http://dx.doi.org/10.5255/UKDA-SN-6379-1.

Nazroo, J.Y. (1998) Rethinking the relationship between ethnicity and mental health: the British Fourth National Survey of Ethnic Minorities. *Social Psychiatry and Psychiatric Epidemiology.* 33, 145-148.

Nezlek, J.B. (2001). Multilevel Random Coefficient Analyses of Event- and Interval-Contingent Data in Social and Personality Psychology Research. *Personality and Social Psychology Bulletin.* 27(7), 771-785.

Paccagnella, O. (2006). Centering or Not Centering in Multilevel Models? The role of the group mean and the assessment of group effects. *Evaluation Review.* 30(1), 66-85.

Paul, K.I. and Moser, K. (2009). Unemployment impairs mental health: Meta-analyses. *Journal of Vocational Behaviour.* 74, 264-282.

Parkinson, J. (2007). *Establishing a core set of national, sustainable mental health indicators for adults in Scotland: Final report. December 2007.* NHS Health Scotland. pp. 1-87.

Patton, G.C., Coffey, C., Posterino, M. Carlin, J.B., Wolfe, R. and Bowes, G. (1999). A computerised screening instrument for adolescent depression: population-based validation and application to a two-phase case-control study. *Social Psychiatry and Psychiatric Epidemiology.* 34(3), 166-172.

Piccinelli, M. and Wilkinson, G. (2000). Gender Differences in Depression: Critical Review. *British Journal of Psychiatry.* 177, 486-492.

Pilgrim, D. and Bentall, R. (1999). The medicalisation of misery: A critical realist analysis of the concept of depression. *Journal of Mental Health.* 8(3), 261-274.

Plewis, I. and Fielding, A. (2003). What is Multi-level Modelling for? A Critical Response to Gorad (2003). *British Journal of Educational Studies.* 51(4), 408-419.

Prince, M., Patel, V., Saxena, S., Maj, M., Maselko, J., Phillips, M.R. and Rahman, A. (2007). No health without mental health. *The Lancet.* 370, 859-877.

Propper, C., Jones, K., Bolster, A., Burgess, S., Johnston, R. and Sarker, R. (2005). Local neighbourhood and mental health: Evidence from the UK. *Social Science and Medicine.* 61, 2065-2083.

Rabe-Hesketh, S. and Skrondal, A. (2012). *Multilevel and Longitudinal Modelling using Stata (Third Edition).*College Station, TX: Stata Press. Volume I: Continuous Responses.

Rabe-Hesketh, S. and Skrondal, A. (2012). *Multilevel and Longitudinal Modelling using Stata (Third Edition).*College Station, TX: Stata Press. Volume II: Categorical Responses, Counts, and Survival.

Rabe-Hesketh, S. and Skrondal, A. (2006). Multilevel modelling of complex survey data. *J.R. Statist. Soc.* A. 169(4), 805-827.

Research Councils UK (2010). *Delivering the UK's e-infrastructure for research and innovation.* Dept. for Business Innovation and Skills, July 2010. 1-39.

Reiger, D.A., Kuhl, E.A. and Kupfer, D.J. (2013). The DSM-5: Classification and criteria changes. *World Psychiatry.* 12(2), 92-98.

Robins, L.N., Helzer, J.E., Croughan, J.L. and Ratcliff, K.S. (1981). National Institute of Mental Health Diagnostic Interview Schedule: its history, characteristics and validity. *Archive of General Psychiatry.* 38, 381-389

Robins, L.N. and Cottler, L.B. (2004). Making a Structured Psychiatric Diagnostic Interview Faithful to the Nomenclature. *American Journal of Epidemiology.* 160(8), 808-813.

Robins LN, Regier DA eds. (1991) *Psychiatric Disorders in America: The Epidemiologic Catchment Area Study*. New York: The Free Press.

Rogers, A. and Pilgrim, D. (2003). *Mental health and inequality.* Basingstoke: Palgrave Macmillan.

Rogers, A. and Pilgrim, D. (2014). *A Sociology of Mental Health and Illness, 5th edition.* Berkshire: Open University Press.

Rogers, C.R. (1961). *On becoming a person.* Boston: Houghton Mifflin.

Rojas, M. (2007). Heterogeneity in the relationship between income and happiness: A conceptual referent theory explanation. *Journal of Economic Psychology.* 28, 1-14.

Romera, I., Victor, P., Menchon, J.M.., Polavieja, P. and Gilaberte, I. (2013). Optimal cutoff point of the Hamilton Rating Scale for Depression accordong to normal levels of social and occupational functioning. *Psychiatry Research.* 186(1), 133-137.

Rosenfield, S. and Mouzon, D. (2012). *Gender and Mental Health, Chpt 14,* In. Aneshensel, C.S., Phelan, J.C. and Bierman, A. (Eds) (2013). *Handbook of the Sociology of Mental Health.* New York: Springer.

Roux, A.V.D. (2002). A glossary for multilevel analysis. *Journal of Epidemiology and Community Health.* 56, 588-594.

Royal College of Psychiatrists (RCPSYCH) (2010). *No health without public mental health: The case for action: Position Statement PS4/2010.* Royal College of Psychiatrists: London.

Ruggeri, M., Leese, M., Thornicroft, G., Bisoffi, G. and Tansella, M. (2000). Definition and prevalence of severe and persistent mental illness. *British Journal of Psychiatry.* 177, 149-155.

Ryan, R.M. and Deci, E.L. (2000). Intrinsic and Extrinsic Motivations: Classic definitions and new directions. *Contemporary Educational Psychology.* 25, 54-67.

Ryan, R.M., Chirkov, V.I., Little, T.D., Sheldon, K.M., Timoshina, E. and Deci, E.L. (1999). The American Dream in Russia: Extrinsic Aspirations and Well-Being in Two Cultures. *Personality and Social Psychology Bulletin.* 25(12), 1509-1524.

Ryff, C.D. (1989). Happiness is Everything, or Is It? Explorations on the Meaning of Psychological Well-Being. *Journal of Personality and Social Psychology.* 57(6), 1069-1081.

Saracci, R. (1997). The World Health Organization needs to reconsider its definition of health. *British Medical Journal.* 314, 1409-1410.

Scheid, T.L. and Brown,T.N. (2010). *A Handbook for the Study of Mental Health: Social Contexts, Theories, and Systems. Second Edition.* New York: Cambridge University Press

Schrijvers, D.L., Bollen, J. and Sabbe, B.G.C. (2012). The gender paradox in suicidal behaviour and its impact on the suicidal process. *Journal of Affective Disorders.* 138, 19-26.

Siegrist, J. (1996). Adverse health effects of high effort/low reward conditions. *Journal of Occupational Health Psychology.* 1(1), 27-41.

Scowcroft, E. (2014). *Samaritans: Suicide Statistics Report 2014, Including data for 2010-2014.* Samaritans. (Online) Report available from [http://www.samaritans.org/sites/default/files/kcfinder/files/research/Samaritans%20Suicide%20Statistics%20Report%202014.pdf] (Accessed 14th Jan 2015).

Singleton, N., Bumpstead, R., O'Brien, M., Lee, A. and Meltzer, H. (2001) *Psychiatric Morbidity among Adults Living in Private Households, 2000,* The Stationary Office: London

Skapinakis, P., Weich, S., Lewis, G., Singleton, N. and Araya, R. (2006). Socio-economic position and common mental disorders: Longitudinal study in the general population in the UK. *British Journal of Psychiatry,* 189, 109-117.

Skinner, K. and Vieira, M.T. (2007). Variance estimation in the analysis of clustered longitudinal survey data. *Survey Methodology.* 33(1), 3-12.

Snijders, T. and Bosker, R. (1999). *Multilevel Analysis: An introduction to basic and advanced multilevel modelling.* London: Sage

Snijders, T. and Bosker, R. (2012). *Multilevel Analysis: An introduction to basic and advanced multilevel modelling, 2nd Edition.* London: Sage

Spitzer, R.L. and Fleiss, J.L. (1974). A Re-analysis of the reliability of psychiatric diagnosis. *British Journal of Psychiatry.* 125, 341-347.

Spitzer, R.L., Williams, J.B.W., Gibbon, M. and First, M.B. (1990a). *Structured Clinical Interview for DSM-III-R, Patient Edition/Non-Patient Edition, (SCID-P/SCID-NP).* Washington, DC: American Psychiatric Press.

Spitzer, R.L., Williams, J.B.W., Gibbon, M. and First, M.B. (1990b). *Structured Clinical Interview for DSM-III-R Axis II Disorders, (SCID-II).* Washington, DC: American Psychiatric Press.

Stansfeld, S. and Candy, B. (2006). Psychosocial work environment and mental health - a meta-analytic review. *Scandinavian Journal of Work, Environment and Health.* 32(6), 443-462.

Stansfeld, S., Rasul, F.R., Head, J. and Singleton, N. (2011). Occupation and mental health in a national UK survey. *Social Psychiatry and Psychiatric Epidemiology.* 46, 101-110.

Stansfeld, S.A., Pike, C., McManus, S., Harris, J., Bebbington, P., Brugha, T., Hassiotis, A.,
Jenkins, R., Meltzer, H., Moran, P. and Clark, C. (2013). Occupations, work characteristics and common mental disorders. *Psychological Medicine.* 43, 961-973.

StataCorp. (2013). *Stata Statistical Software: Release 13.* College Station, TX: StataCorp LP.

Steel, Z., Marnane, C., Iranpour, C., Chey, T., Jackson, J.W., Patel, V. and Silove, D. (2014). The global prevalence of common mental disorders: a systematic review and meta-analysis 1980-2013. *International Journal of Epidemiology,* 0(0), 1-18.

Steele, F. (2008). Multilevel Models for Longitudinal Data. *Journal of the Royal Statistical Society, Series A.* 127(1), 5-19.

Steptoe, A., Deaton, A. and Stone, A.A. (2015). Subjective wellbeing, health, and ageing. *The Lancet.* 385(9968), 640-648.

Sturgis, P. (2004). Analysing Complex Survey Data: Clustering, Stratification and Weights. *Social Research Update.* 43, 1-4.

Subramaniam, K., Krishnaswamy, S., Jemain, A.A., Hamid, A. and Patel, V. (2006). The Clinical Interview Schedule Revised (CIS-R) - Malay Version, Clinical Validation. *Malaysian Journal of Medical Sciences.* 13(1), 58-62.

Taris, T.W. (2002). Unemployment and mental health: A longitudinal perspective. *International Journal of Stress Management.* 9, 43-57.

Thoits, P.A. (2011). Mechanisms Linking Social Ties and Support to Physical and Mental Health. *American Sociological Association.* 52(2), 145-161.

Thomas, C., Benzeval, M. and Stansfeld, S.A. (2005). Employment transitions and mental health: an analysis from the British household panel survey. *Journal of Epidemiology and Community Health.* 59, 243-249.

Thomas, C., Benzeval, M. and Stansfeld, S.A. (2007). Psychological distress after employment transitions: the role of subjective financial position as a mediator. *Journal of Epidemiology and Community Health.* 61, 48-52.

Twenge, J.M. and Campbell, W.K. (2010). Birth cohort differences in the Monitoring the Future dataset and elsewhere: Further evidence for Generation Me. *Perspectives on Psychological Science.* 5, 81-88.

Twenge, J.M., Campbell, W.K. and Freeman, E.C. (2012). Generational Differences in Young Adults' Life Goals, Concern for Others, and Civic Orientation, 1966-2009. *Journal of Personality and Social Psychology.* 102(5), 1045-1062.

University of Essex. (2010). Institute for Social and Economic Research, *British Household Panel Survey: Waves 1-18, 1991-2009* [computer file]. *7th Edition.* Colchester, Essex: UK Data Archive [distributor], July 2010. SN: 5151, http://dx.doi.org/10.5255/UKDA-SN-5151-1

Ustun, B.T. and Jakob, R. (2005). Calling a spade a spade: meaningful definitions of health conditions. *Bulletin of the World Health Organization.* 83(11), 802-803.

Van de Velde, S., Bracke, P. and Levecque, K. (2010). Gender differences in depression in 23 European countries. Cross-national variation in the gender gap in depression. *Social Science and Medicine.* 71, 305-313.

Veenhoven, R. (2012). Cross-national differences in happiness: Cultural measurement bias or effect of culture? *International Journal of Wellbeing.* 2(4), 333-353.

Wakefield, J. (1992). Disorder as harmful dysfunction: a conceptual critique of DSM-III-R's definition of mental disorder. *Psychological Review.* 99(2), 232-247.

Wakefield, J. (2007). The concept of mental disorder: diagnostic implications of the harmful dysfunction analysis. *World Psychiatry.* 6(3), 149-156.

Wakefield, C. and Schmitz, M.F. (2010). *The Measurement of Mental Disorder.* pp. 20-45. In Scheid, T.L. and Brown, T.N. (Ed's) (2010). *A Handbook for the Study of Mental Health: Social Context, theories and systems, 2nd Edition.* New York: Cambridge University Press.

Waldron, S. (2010). *Measuring Subjective Wellbeing in the UK.* Working Paper, September 2010. Office for National Statistics. pp.1-70.

Glendinning, R., Buchanan, T. and Rose, N., NOP Social and Political with Angela Hallam (2002) Well? What do you think? *A National Scottish Survey of Public Attitudes to Mental Health, Well-Being and Mental Health Problems.* Scottish Executive Social Research

West, P. (1998). *Perspectives on Health Inequalities: The need for a life-course approach*. MRC Social & Public Health Sciences Unit. Occasional Paper, September 1998.

Weich, S. and Lewis, G. (1998). Poverty, unemployment and common mental disorders: population based cohort study. *British Medical Journal.* 317, 115-119.

Wiggins, R. D., Schofield, P., Sacker, A., Head, J., and Bartley, M. (2004). Social Position and Minor Psychiatric Morbidity over Time in the British Household Panel Survey 1991-1998. *Journal of Epidemiology & Community Health*, 58, 779-787.

Wilkinson, R. and Marmot, M. (eds.) (2006). *Social Determinants of Health, 2nd Edition.* Oxford: Oxford University Press, pp.376.

Wilkinson, R. and Marmot, M. (eds.) (2003). *The Social Determinants of Health: The Solid Facts, 2nd Edition.* World Health Organisation: Geneva.

Wilkinson, R. G. and Pickett, K.E. (2009). *The Spirit Level: Why More Equal Societies Almost Always Do Better.* Penguin Books: London.

Williams, S.J. (2000). Reason, emotion and embodiment: is 'mental' health a contradiction in terms? *Sociology of Health and Illness.* 22(5), 559-581.

Williams, J.B. (2001). Standardizing the Hamilton Depression Rating Scale: past, present, and future. *European Archives of Psychiatry and Clinical Neuroscience.* 251(2), 112-116.

Wing, J.K., Cooper, J.E. and Sartorius, N. (1974). Present State Examination (PSE). *Measurement and Classification of Psychiatric Symptoms; an instruction manual for the PSE and Catego Program.* London: Cambridge University Press.

Wing, J.K., Babor, T., Brugha, T., Burke, J., Cooper, J.E., Giel, R., Jablenski, A., Regier, D. and Sartorius, N. (1990). SCAN: Schedules for Clinical Assessment in Neuropsychiatry. *Archive of General Psychiatry.* 47(6), 589-593.

Wing, J. (1996). SCAN and the PSE tradition. *Social Psychiatry and Psychiatric Epidemiology.* 31, 50-54.

Winkelmann, L. and Winkelmann, R. (1998). Why Are the Unemployed So Unhappy? Evidence from Panel Data. *Economica.* 65, 1-15.

Wittchen, H-U. and Jacobi, F. (2005). Size and burden of mental disorders in Europe - A critical review and appraisal of 27 studies. *European Neuropsychopharmacology.* 15, 357-376.

Wittchen, H-U. (1993). *Reliability and validity studies of the WHO-Composite International Diagnostic Interview (CIDI): A critical review.* Journal of Psychiatric Research. 28(1), 57-84.

World Health Organisation (1992). *The ICD-10 classification of mental and behavioural disorders: clinical descriptions and diagnostic guidelines.* Geneva, World Health Organisation.

World Health Organisation (2005). *Mental Health: facing the challenges, building solutions. Report from the WHO European Ministerial Conference.* Copenhagen, Denmark: WHO Regional Office for Europe, 2005.

World Health Organisation (2012). *Risks to Mental Health: An overview of vulnerabilities and risk factors. Background paper by WHO Secretariat for the development of a comprehensive mental health action plan.* Geneva, World Health Organisation.

World Health Organisation (2001). *The World Health Report 2001. Mental Health: New Understanding, New Hope.* Geneva, World Health Organisation.

World Health Organisation (1946). Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946: Signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no.2, p.100) and entered into force on 7 April 1948. Available from [http://www.who.int/about/definition/en/print.html] (Accessed 21st Jan 2015).

Declaration

I, Patrick Clark confirm that the work presented in this thesis is my own. Any other sources are cited in the thesis.

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