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Measuring capabilities an empirical investigation of the sen-nussbaum approach to well-being

Thesis

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Measuring Capabilities: An Empirical Investigation of the Sen - Nussbaum Approach to Well-Being

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Abstract

This thesis argues for the view that Amartya Sen's capabilities approach is a preferable approach to the measurement of welfare by addressing three questions:

can the capability approach be operationalised?

what is the relationship between capabilities and satisfaction with life.?

how do capabilities respond to changes over time?

Chapter 1 provides a discussion of a widely used economic evaluation model of welfare focussing on some of its key problems and concludes with a discussion of Sen's alternative capabilities approach.

Chapter 2 discusses the three key relationships that Sen uses in evaluating wellbeing and discusses the identification of capabilities based on the account developed by Martha Nussbaum.

Chapter 3 explores the operationalisation of the capabilities approach using data relating to capabilities in the British Household Panel. Analysis of this data shows a statistically significant relationship between some of these capability indicators and subjective well-being.

Chapter 4 develops a survey instrument to obtain a more comprehensive measure of an individual's capabilities. The subsequent analysis shows that many of these indicators are linked to satisfaction with life.

Chapter 5 uses fixed effects models of a capability index, to explore the pattern of adaptation to shocks in employment, widowhood and ill health. It concludes that capabilities adjust to some shocks but only incompletely and differently for different shocks.

Chapter 6 highlights five contributions to the literature of this thesis – namely that:

i.   capabilities can be measured according to the methodological norms that commonly prevail in household surveys.

ii.   capabilities operate in a dynamic context.

iii.   agency and autonomy (both important aspects of the capability approach) influence satisfaction with life.

iv.   the relative importance of capability domains in overall life satisfaction is influenced by age and gender.

v.   individuals' capability levels adapt to shocks through both an anticipation and an adaptation effect

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Chapter Summaries

Chapter 1 describes the motivation for the thesis by reviewing some of the weaknesses of a (if not the most) widely used evaluation model in economics – the neoclassical model (based on financial or hedonic criteria). It then compares the three most frequently used measures of welfare; income, happiness and capability.

Chapter 2 describes the capability approach to welfare measurement in more detail beginning with Sen's formal statement of the approach with its emphasis on human capabilities. It concludes with a list of capabilities proposed by Martha Nussbaum which is used throughout the remainder of the thesis.

Chapter 3 examines the British Household Panel (BHPS) data set, a common source of secondary data, to identify whether it contains measures, which can be used as indicators of capabilities. The fifty-one measures identified are then used to examine some of the issues involved in operationalising the capability approach. This data is used to explore the

relationship between an individual's satisfaction with life and their capabilities.

Chapter 4 builds on the results of chapter 3 by developing a tailor made questionnaire to deal with the deficiencies of data resulting from secondary sources. This questionnaire allows all the capabilities listed by Nussbaum to be measured. In addition, questions to help identify personality types are included, to take account of one of the findings in Chapter 3 that person specific effects are relevant to considerations of an individual's capability level. This comprehensive data set is then used to revisit the relationship between satisfaction with life and capabilities.

Chapter 5 moves from static analysis of capabilities to investigate how they are shaped by events. In this dynamic analysis fixed effect regressions of fifteen waves of BHPS data are analysed to identify the effects of three external shocks, unemployment, widowhood and ill-health on an individual's capabilities. A control for windfall payments is introduced in order to identify to what extent a cash payment mitigates the

impact of the shock. An analysis of whether the shock impacts differently on different personality types is also made.

Chapter 6 highlights the main findings of the thesis. Firstly that suitable instruments can be developed to allow capabilities to be measured and that in any such measures personal effects and a consideration of past experience and future expectations should be included. Secondly, it finds that the relationship between satisfaction with life and capabilities is complex, highly multi-dimensional and different for men and women. Finally it finds that there is both an anticipation and an adaptation element in the response of capabilities to external shocks and that different capabilities respond to different shocks in different ways.

Chapter 1 Introduction and Background

1.1 Motivation

Economics may have the reputation of being a dismal science but it has at its heart the objective of improving the well-being of the economic agents who make up the economy under study. Economic theory considers whether a course of action is beneficial or not by judging whether it increases society's overall level of utility.

One popular Dictionary of Economics (Penguin 1998) defines utility 'as the ultimate goal of economic activity' and it forms a cornerstone of micro economic theory (see for example Varian (1992) pp. 94 - 105). However since the 1930's, under the influence of Robbins (1932), utility lost all connotations of well-being, satisfaction with life or happiness until the last ten years when a growing body of work has questioned this approach arguing for a new approach to welfare economics.

The conventional view remains that utility is a preference index over goods that are traded, reflecting observed behaviour. One reason for this

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approach is that faced with the difficulty of measuring states of mind economists have shied away from the need to compare one individual's utility with another and instead relied on the concept of ordinal utility as an index of consumer's preferences. This position was further entrenched when Hicks (1934) and Allen (1934) showed that demand theory only requires ordinal utility and by Samuelson (1938) who formalised the behaviouristic requirements of standard micro economic theory in which utility needed to be no more than a preference. When Becker (1962) showed that it is possible to derive demand theory's conclusion that a price rise induces a fall in demand without using the concept of utility theory, any remaining idea that utility was a measure of satisfaction or pleasure was lost. However, economists still adopted the normative position dating from Bergson (1938) and Samuelson (1947), in which economists saw their role as being to advise governments as to how to maximise the utility or welfare of society as a whole. This left the question of how to measure welfare, which is considered in the next section.

1.2 Measuring Welfare

1.2.1 A neo-classical view

Neo classical consumer theory assumes that well informed rational consumers make consistent choices so as to maximise their utility subject to their budget constraint. Formally the consumer's problem is to find a solution to

$$\max U(x)$$

$$\text{such that } px \leq m \qquad .$$

where U is the consumer's utility, p is a vector of the prices of goods x, and m is the consumer's income constraint. The point at which the consumer achieves her utility maximising bundle of goods is described by the indirect utility function

$$V(p,m) = \max U(x)$$

$$\text{such that } px = m$$

which gives the maximum utility achievable at given prices and income.

Utility

$v\ (p,m\ )$

Income
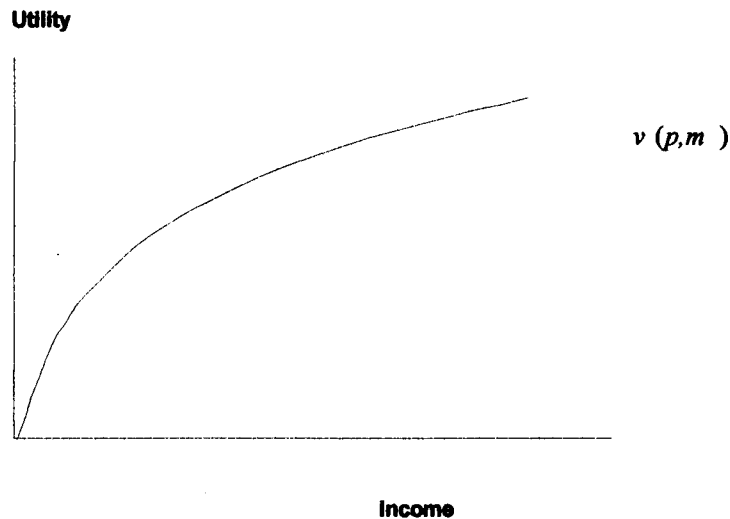
Figure 1: Indirect Utility

As Figure 1 shows, if the consumer's preferences are insatiable then the indirect utility function $V(p,m)$ is strictly increasing in m and if prices p are constant then the consumer's indirect utility will be a function only of her income (m). Utility will however suffer from diminishing marginal returns (the specification of the equation is important because a polynomial specification gives an inverted U shaped curve.) such that each additional unit of income has less effect on indirect utility that the previous one. Since in this approach income is the limiting factor in determining an individual's utility any attempts to measure utility can be forgone and utility becomes

synonymous with income at an individual level and Gross Domestic Product (GDP) or Gross national Product (GNP) at a national level.

1.2.2 The revealed preference model and its aims

The revealed preference model, based on the concept of a rational decision maker, was defined by von Neumann, and Morgenstern (1944) who by including uncertainty in their model were able to include a cardinal measure of utility rather then the ordinal measure as used in previous models. They considered preferences to be relatively unchanging and consistent (both at a point in time and over time). If A is preferred to B and B to C, then A will be preferred to C (the transitivity principle) and having made their choice individuals will not regret their decision (there is no benefit to hindsight).

An individual's preferences are also independent of those of others, and their choice decisions are not influenced by the choices made by peers or aspirational groups. These rational agents are well informed with perfect information about the products offered in the market, helped by advertising whose role is to provide information or guarantee quality not to influence choices. Any "external" effects with consequences for the welfare of others

in the production and consumption of the goods demanded by individuals will be reflected in their price. Finally, there are complete and competitive markets in the alternatives to consumption of goods and services such as savings, public goods, and the purchase of leisure as to consumption. These assumptions combined with the conditions of free entry and exit of firms, providing consumer goods to the market, imply that individuals are rational and know best what is good for them. Consumers will thus act in their own interest to maximise their own well-being. Firms will provide what individuals want, otherwise they will not survive in this competitive marketplace. Competition, serving rational economic agents will result in a higher level of societal well-being than could be achieved through government regulation or political action.

This being the case, it raises the question of why in 2008/9 the government Central Office of Information spent £232 million on advertising, much of it (for example on smoking) is designed to persuade economic agents to change their preferences, and a sum which is more than matched by many large companies. Schwarz (2004) points out that the average American now sees over 3,000 adverts per day. This expenditure together with the sums spent on marketing activity makes the assumption of

relatively fixed preferences highly questionable. In the next section, the assumption of fixed preferences is questioned by considering the role that advertising plays in shaping consumer's preferences.

1.2.3 The Shaping of Preferences.

Those who subscribe to this neo-classical welfarist view, admit some deviations from these highly idealised conditions, nevertheless the view that unfettered or minimally fettered markets produce the best outcome for society as a whole prevails. The rational economic agent model may be a reasonable one when making some everyday consumption choices, but it encounters problems when dealing with many choice decisions such as consumption versus leisure, branded goods versus non branded goods, and savings versus borrowing. It requires rational, information hungry, consistent, independent people that it is difficult to equate with those living under the pressures which individuals in a modern society face. The complex financial products with which consumers have to contend is just one example where consumers have difficulty processing all the relevant information. Easterlin, (2001a) argues that preferences, or aspirations, are not fixed as traditional economic theory assumes, but instead grow along

with income thus undercutting the favourable effect of the growth in income on happiness. One of the major influences on aspirations in developed countries is advertising whose effect on preference formation and therefore their consumption choices tends to be ignored by economists.

Julian Simon (1970, p. 285) sums up the neo-classicists view of advertising by concluding that "the economic study of advertising is not deserving of great attention … if there are important issues in advertising they concern aesthetics and morals." His contention in what he calls his "spread it around" hypothesis is that "advertising merely affects how people distribute their expenditure in any given year and does not affect the sum of them" (Simon, 1970, p.195). Simon argues that the relative stability of the long-run average propensity to consume of the US, in spite of an increase in the amount spent on advertising, is confirmation of Friedman's (1957) permanent income theory rather than the effects of advertising.

Consistent with point of view, Hayek (1937) arguing from an Austrian school perspective points out that the distinguishing feature of a market economy is that all transactions are voluntary. In such an economy, consumers decide on which transaction to make according to all the information available. Advertising Hayek contends acts as a toll, which

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enables the market to perform by providing information to consumers, which allows them to choose the best product and thereby reward the best producers in the market. Nelson (1974) argues that producers by spending large sums of money on advertising are "signalling" to consumers that their product is the best, shares this view. However, Moorthy and Zhao (2000) conclude that consumers do not have a sophisticated understanding of the signal companies are trying to send, they simply associate more advertising with higher quality. Thus, the producer of a low quality product who advertised a lot could confuse consumers.

An alternative point of view is taken by Fine and Leopold (1993, p12) who see advertising as playing a much stronger role by shaping consumer preferences by endowing " the commodity with properties over and above their capacity to achieve them – even in the imagination". The result they argue is that advertising's role is to create a consumer society to satisfy the requirements of mass production. Galbraith (1967, p. 210) argues that economists underestimate the economic effects of advertising stating that "the present disposition of conventional economic theory to write off annual outlays of many billions of dollars advertising of advertising and similar sales costs by the industrial system as without purpose or

consequence is to say the least peculiar." The role of advertising and sales promotion Galbraith contends extends beyond the control of prices and the management of demand to that of shaping social attitudes to those that are necessary for the performance of the industrial system. Without the sales effort necessary to manage demand, the increasing abundance of goods might well result in consumer's needs being satisfied. This in turn could mean that less of the consumer's income would be spent on goods or that they might decide to work less. The consequence – lower and less reliable propensity to consume – he concludes would be awkward for the industrial system. In other words, advertising can act against consumers being satisfied and thereby happy.

Duesenberry's (1949) in his relative income hypothesis argues that the consumption of individuals is related to the consumption of others, and thus consumption decisions are influenced by the decisions of others. The use of celebrities and role models in advertising is one example of an attempt to use such peer group pressure to influence consumer choices.

The view of advertising as a form of non-price competition used to build up the loyalty of consumers to a product by associating that product with particular characteristics or by signalling that the product is of quality

surely undervalues the effect of advertising. As Galbraith points out a belief that firms are prepared to incur vast advertising expenditure for no apparent reason does not sit well with the concept of rational economic agents. This is certainly not the view of marketing practitioners such as Carpenter et al (1997 p. xvii) who argue that "marketing strategy can through competitive strategy shape customer preferences and decision making". The cumulative impact of advertising in all its forms means that consumer preferences are not completely exogenous but instead are heavily influenced and constantly changed by advertising and the consumer orientated view of the media.

Advertising is therefore constantly suggesting what would make a good life; a thinner body, a bigger car, or the latest model of mobile phone. Cooper and Penalosa (1998) explore the relationship between two goods – 'normal goods' which confer utility directly and 'status goods' which confer utility only at the expense of someone who consumes less of the good. They conclude that there is a tendency for research and development to be concentrated on 'status goods' at the expense of 'normal goods'. Thus advertising may persuade consumers to want things that will not necessarily increase their well-being but instead merely persuade them to want more: consumption becomes good. Underlying a belief in the market as the best

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way of allocating goods and services is a value system, which as Galbraith (1970) points out gives full reign to the market. This constant desire on the part of economic agents for more goods plays a crucial role in maintaining the level of consumption, which is an important driver of economic growth leading to an increasing national income.

Basing welfare measurement on a model in which preferences are not amenable to manipulation is therefore questionable

1.2.4 What is welfare?

In answering this question, the issue of how to aggregate individual's views in order get agreement on what constitutes a society's welfare needs to be addressed. In his 1950 paper '*A Difficulty in the Concept of Social Welfare*' Kenneth Arrow highlighted the difficulty of aggregating individual views to reach a consensus and as a result challenged the role of governments in maximising social welfare. In this paper, he outlined his impossibility theorem. Arrow's contention was that it was impossible to combine sets of individual preferences into cogent sets of corresponding social decisions through a voting system, which satisfied the reasonable criteria of, non-dictatorship, universality, independence of irrelevant attributes,

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monotonicity, and citizen sovereignty. Non-dictatorship requires that the preference of no one voter be given more importance than another. Universality requires that the voting mechanism must account for all individual preferences such that the resulting social welfare function yields a unique and complete ranking of societal choices. Independence of irrelevant alternatives means that the social welfare function should provide the same ranking of preferences among a subset of options as it would for a complete set of options. Monotonicity requires that there should be a positive association between the values of individuals and society. Finally, citizen sovereignty implies that the social welfare function is subjective and thus has an unrestricted target space such that every possible societal preference order should be achievable by some set of individual preference orders. Arrow showed that under these conditions, if society has at least two members and at least three options to vote on then it is impossible to design a social welfare function that satisfies all these criteria at once. For example assume that three voters A, B, C have the following ranking of their preferences A:$[x,y,z]$, B$[y,z,x]$, C$[z,x,y]$. A and B voting together could bring about y to the detriment of C, but C and A could vote to bring about x to the detriment of B, but again B and C could vote to bring about z to the

detriment of A. There is no stable voting outcome of these three voters faced with these three options.

Faced with this difficulty, rather than attempt to evaluate alternative welfare functions, welfare economists used the concept of Pareto efficiency to judge alternative states of the economy. An economy is said to be Pareto efficient when no one can be made better off, in their own estimation, without making someone else worse off, again in their own estimation. Thus, the concept of Pareto efficiency conceptualises economic agent's utility in terms of his or her own perception of it. However, as with most things the devil is in the detail. Pareto efficiency does not mean that a Pareto efficient society is a fair one. Pareto efficiency would not allow one individual with all the resources to be made worse off, in order for those without any, to be made better off. In addition Sen (1970) argued that Pareto efficiency can be in conflict with liberal ideas, the prude may feel worse off by the lewd being allowed to read *'Lady Chatterley's Lover'*.

Faced with these difficulties in trying to decide what would be a fair or equitable distribution of resources many economists fall back on letting Adam Smith's "invisible hand" resolve the problem. The argument being that in a free market system, economic agent's acting in his or her own self-

interest will arrive at the most satisfactory outcome. Over time, this has led to the prevailing view in the developed world of what has become known as the Anglo-Saxon model. In this model the primary role of government is to maintain a framework of rules that govern how societies make collective decisions and how individuals interact.

This view has been further reinforced by the work of philosophers such as Rawls (1971) and Nozick (1974), who argue that theories of economic and social justice do not have to be based on ideas of how to maximise the well-being of society as a whole. Sugden (1993) argues that provided the procedures used are fair, are undertaken with agreement of those involved and preserve human rights then individuals are free to act on their preferences but we do not need to consider how these preferences are formed. Individuals are left free to pursue their own ends and it is in this way that society's well-being will be maximised.

Amartya Sen has been a key critic (Sen 1970, 1973, 1976, 1977a, 1977b, 1979b) of Arrow's position arguing that his impossibility theorem results from its informational base being too thin to support a theory of societal well-being. Peoples' revealed preferences and the assumption of rational economic agents does not provide a sufficient basis from which to

develop a concept of what would constitute a good life. Instead, we should accept the relevance of information about features of the world other than individuals' revealed preferences. We should start from a conception of what makes a good life for a human being, and build up from this to a theory of the social good. In answer to the question "who decides what makes a good life?" Sen contends that there are some significant areas, which, everyone can agree improves well-being whatever their more general commitments. Rational argument and debate about others is part of what makes a good life in a good society[1]. It is the opportunity to live a good life, rather than the accumulation of resources, that matters most for well-being. These opportunities result from the capabilities that people have. Thus, his approach focuses more on people and less on goods. In it, resources do not have an intrinsic value instead; their value derives from the opportunity that they give to people.

The capability approach is the main focus of this thesis but before going on to describe it in more detail in Chapter 2, three alternative measures of welfare are considered.

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[1] See also Alkire (2002a) and Atkinson (1999)

1.3 Income as a measure of welfare

Using income as a welfare continues to be the prevailing view, where either personal income or national income such as Gross Domestic Product (GDP) or Gross National Product (GNP is used). This in spite of the fact that as Graff (1957) among others has pointed out welfare and goods are defined over different spaces. The GDP function is of the form $G(x)$ where x is a chosen bundle of goods whereas a welfare function is of the form $W(U_i(x_m))$ where U_i is the utility that individual i obtains from her basket of goods x_m. For these two functions to be comparable each individual would need to obtain the same utility from the chosen goods in the GDP bundle and this is clearly not the case - vegetarians do not get any utility from meat whereas carnivores do.

Both GDP and GNP were originally intended as a measure of market economic activity, including that of the public sector, rather than as measures of societal well-being. There are many examples of their limitation as a measure of well-being in addition to the heterogeneous nature of utility. Parents going out to work and paying for child or family care will increase GDP whereas a parent leaving paid employment to care for a child or family member decreases GDP. Not all would agree that such an increase

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in GDP would reflect an increase in well-being. Similarly, traffic jams will increase GDP as a result of the increased use of gasoline, but not obviously the quality of life. Many of the things people choose to buy e.g. tobacco or alcohol or high calorie food may not be good for them, although the value of their purchase is included in GDP. The monetary value of products whose contribution to quality of life is complex and multi-dimensional such as medical services, educational services, and research activities does necessarily reflect the benefits to society's overall level of well-being.

In spite of many such arguments each month's GDP growth or decline is eagerly awaited and political parties vie with each other as to who will grow the economy most. However, over the last ten years there are signs that this view may be changing. In February 2008, for example such limitations were recognised by the President of the French Republic, Nicholas Sarkozy, who set up "The Commission on the Measurement of Economic Performance and Social Progress". The commission was led by three of the leading economists, Joseph Stiglitz, Amartya Sen and Jean-Paul Fitoussi had the role of identifying the limits of GDP as an indicator of economic performance and social progress, and to consider what additional information might be required for the production of more relevant indicators

of social progress. It reviewed three main conceptual approaches to the measurement of societal well being (what it called quality of life). The first based on the notion of subjective well-being, measures satisfaction with life (or happiness), the second capabilities, and the third on economic notions drawn from the theory of fair allocations. One of the commissions main findings was that well-being is multi-dimensional.

1.4 Happiness as a measure of welfare

As Tibor Scitovsky argued in *The Joyless Economy* (1976) a difficulty with using income as a measure of well-being is that many of the things that affect an individual's well-being are not for sale in the market. van Boven and Gilvoch (2003) found that experiences made people happier than material possessions. In two surveys, they found that the respondents reported that purchases made with the primary purpose of acquiring a life experience made them happier than the purchase of possessions.

Such considerations have, in recent years, led economists to look for alternative measures of welfare that aggregate the experiences of diverse groups of people resulting from other aspects of their life in addition to the consumption of a variety of goods and services. Using survey data where a

question of the form 'Taking all things considered how satisfied with your life are you?' is asked a growing number of economists have been using this subjective measure of well-being to explore issues of welfare (see e.g. Layard 2005). This view is grounded in the long philosophical tradition which considers individuals as the best judges of their own conditions and is consistent with the economic concept of individuals as fully informed rational decision makers, nevertheless there has been some reluctance by economists, although a decreasing one, to use such subjective measures.

Psychologists on the other hand argue that such measures of subjective well-being are amenable to systematic quantification (Kahneman, Diener and Schwartz, 1999). Headley and Wearing (1989) put forward a dynamic equilibrium theory, in which the fundamental levels of subjective well-being are determined by an individual's genetic capacity to be happy. Events may move people above or below this level but in time, they will return to this stable level. Their study of Australian panel data showed that very stable personality traits (neuroticism, extraversion, and openness to experience) predispose people to experience moderately stable levels of happiness before and after favourable and adverse life events. However, they also found that life events influence happiness over and above the

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effects of personality. Brickman, Coates, and Janoff-Bulman, (1978) found that a favourable event (winning the lottery) and an unfavourable event (becoming a quadriplegic or paraplegic) had little effect on levels of happiness.

Many of these studies have investigated the relationship between subjective well-being and income. Blanchflower and Oswald (2004) found that reported levels of happiness had declined in the US from the early 1970s to the late 1990s and had been approximately flat in Great Britain over the same period in spite of large increases in household income. Richard Easterlin (2001b) also found that subjective well-being in the US is fairly stable over time in spite of increasing income, although at any point in time he found that happiness does vary with income. Easterlin argues that this is because as individuals income increases over time, their aspirations also increase and thus the overall level of happiness does not change. In support of his thesis, he cites the fact that individuals normally consider themselves to have been worse off than they actually were in the past and to anticipate that they will be happier in the future. This linking of subjective well-being to income has led to a tendency to equate states of being with

money, for example Clark and Oswald (2002) contend that getting married brings happiness equivalent to an additional income of £70,000 per year.

1.5 Capability as a measure of welfare

The key components of Sen's capability approach are an individual's 'functionings' and their capabilities. Functionings are the things a person actually does and experiences. They may vary from elementary ones, such as being adequately nourished and being free from avoidable disease, to very complex activities or personal states, such as taking part in the life of the community and having self-respect. Individual functionings derive from their 'capabilities', the feasible alternative combinations of these functionings; what they are able to do and to be. Sen argues that the role of governments is to provide the freedoms necessary for its citizens' capabilities to be maximised, which will in turn improve the overall good of society (Sen 1982, pp. 353- 69, 1985a, 1999a).

In Development as Freedom (1999b), Sen differentiates the capabilities approach from the more traditional practical and economic policy analysis. These he considers have, an "economic" concentration on the primacy of income and wealth (rather than on the characteristics of

human lives and substantive freedoms), a "utilitarian" focus on mental satisfaction (rather than on creative discontent and constructive dissatisfaction) and a "libertarian" preoccupation with procedures for liberty (with deliberate neglect of consequences that derive from those procedures).

The income and happiness method of measuring societal well-being begins with one overall measure and then questions whether certain course of action would increase or decrease income or happiness. In neither approach, is there any specific critique of the values and beliefs that underpin a market economy. In contrast the capability approach starts from the other end of the question and asks what would a good life be? It then identifies the conditions that would be necessary to enable individuals to live such a life. Implicit in this approach is the acceptance that this may lead to a different conclusion from what an individual decides is good for her.

The dilemma facing those concerned with how to improve society's well being is how to bring about a more equal society. Do they try to increase total income in the belief that all boats will be lifted in a rising tide? Do they give everyone an equal amount of income to start with and then leave it to the market to determine the outcome? Charles Murray (2006) for example proposes giving every American over twenty-one $10,000 a year

for life and scrapping all US income transfer programmes. Do they aim for some form of redistribution from the rich to the poor?

Concerned with the issue of "Equality of What" Amartya Sen in his 1979 Tanner lecture argued that if we are concerned about equality or fairness we have to take account of the difference in individual's needs. These vary with "health, longevity, climatic conditions, location work conditions, temperament and even body size" and thus their varying abilities to transform a given income into the same output. A disabled person e.g. needs more income to be able to travel than an able-bodied person. Sen argued that what should be equalised are individual's capabilities – what they are able to do and be. He argues that a good society is one in which individuals are free to chose to live a life that they have reason to value. In this approach, individuals are still free to choose how they live their lives but they are not constrained from living a 'good life' by external circumstances or government action. Sen argues that what matters are the capabilities of people; the extent of their opportunity set and of their freedom to choose among this set so that they are able to live a life they have reason to value. Individuals are seen as active agents of change rather than as passive recipients of a received way of life. Changing preferences

through social interaction is a major facet of such a life. The focus of government activity should be on the expansion of human freedom to enable individuals to live the kind of lives that people have reason to value. The role of economic growth in expanding these opportunities has therefore to be integrated into an understanding of the role that economic development plays in the expansion of human capability and as a consequence in allowing citizens to lead more worthwhile and free lives. If preferences can be shaped, why not use reason and argument to shape them to those that give individuals the freedom to live lives they have reason to value?

Chapter 2 The Capability Approach

2.1 Freedoms and Capabilities

Sen (1987, 1992, p. 40) differentiates between an individual's functionings, what they actually do and are, and their capabilities, "the various combinations of functionings that a person can achieve". Capabilities reflect the possibilities that are open to people and are "a set of vectors of functionings, reflecting the person's freedom to lead one type of life or another" they "reflect what real opportunities you have regarding the life you may lead".

Formally, an individual's bundle of commodities (x_i) is converted to a bundle of characteristics of these commodities $c(X_i)$. These characteristics allow an individual to achieve differing levels of functionings b_i

$$\mathbf{b}_i = f_i(c(\mathbf{x}_i))\qquad\text{equation (1)}$$

Individuals obtain utility from their bundle of functionings via their valuation function

$$v_i = v_i(\mathbf{b}_i)\qquad\text{equation (2)}$$

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An individual's possible choice of functionings (her capabilities) depends on her bundle of commodities and her personal conversion factors

$$Q_i = \{ \mathbf{b}_1, \mathbf{b}_2, ..., \mathbf{b}_m \}$$ equation (3)

The relationship between commodities, capabilities and functionings is shown in figure 2.1

Capabilities what you are able to do and be		
Individual's entitlement	Individual's capability set	Individual's functioning
Commodities Vector commodity characteristics (goods and services)	Personal and social conversion factors → Vector of functionings	Individual's choice → Chosen vector of functionings
Means to achieve	Freedom to achieve	Achievement
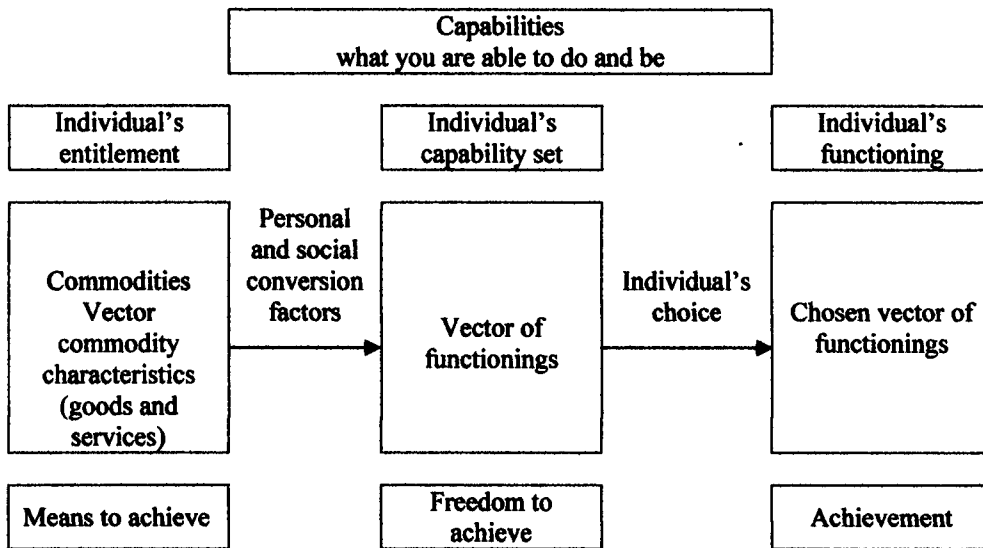
Figure 2.1 The relationship between commodities, capabilities and functionings.

The capability approach sees individuals as active agents of change rather than as passive recipients of a received way of life and therefore preference formation through social interaction is a major facet of life. The focus of government activity should be on the expansion of human freedom to live the kind of lives that people have reason to value. The role of economic growth in expanding these opportunities has therefore to be integrated into an understanding of the process of economic development as the expansion of human capability to lead more worthwhile and more free lives. In this process, using reason to identify and promote better and more acceptable societies has a powerful role to play

2.2 Identifying Capabilities

The, substantial question for anyone trying to implement the capability approach directly concerns the identification of the dimensions of capabilities. The choice of relevant functionings or capabilities for any quality of life measure is a value judgment, rather than a technical exercise. Sen has been reluctant to produce a specific list of such capabilities. He argues that people in different places and times will have different values

and experiences, and therefore the list of the most relevant functionings depends on the circumstances of individuals in that place at that point in time. The debate as to what should be included in such a list is an important part of a free society (Sen 2008).

One area where the capability approach has been used is the Human Development index The index uses per-capita GDP as an indicator of standard of living together with data on life expectancy, and education. According to the International Monetary Fund (2010) the three countries with the highest GDP were the United States, Japan and China, however their HDI ranking was 13th, 10th and 92ndrespectively (Human Development Report 1999). The index was devised economist Mahbub ul Haq in 1990, helped by Amartya Sen. Initially Sen opposed the idea of an index , on the basis that it was difficult to capture the full complexity of human capabilities in a single index but Haq persuaded him that only a single number would shift the attention of policy-makers from concentration on economic well-being to human well-being. Although this may be the case for developing countries, in the more developed high-income countries the focus of government is still on that required for economic rather than human well-being.

The capabilities approach was further developed by Martha Nussbaum following a period of collaboration with Sen, beginning in 1986, Whereas Sen has never made a list of central capabilities[2], Nussbaum (2001) lists ten major areas of capability, which affect the quality of life:

being able to live to the end of a human life of normal length,

being able to have good health;

being able to move freely from place to place;

being able to use the senses, to imagine, think, and reason,

being able to have attachments to things and people outside ourselves,

being able to engage in critical reflection about the planning of one's life,

being able to live with and toward others,

being able to live with concern for and in relation to other species,

being able to laugh, play, and enjoy recreational activities, and

being able to have control over one's environment.

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[2] These were in turn developed from an account in her book, "Women and Human Development" Nussbaum (2000)

Nussbaum contends that her list of capabilities reflect universal human values. In doing so, she makes the point that "the list is, emphatically, a list of separate components "I cannot satisfy the need for one of them by giving a larger amount of another one. All are of central importance and all are distinct in quality." (Page 81) If taken literally her justification for multi-dimensionality appears to depend on a non-compensatory (i.e., lexicographic) reading of the value function, which seems unnecessary. However, Nussbaum's list is of value independently of her account of the values to which it gives rise.

Nussbaum recognises that functionings, not simply capabilities, are what render a life fully human, but argues that capabilities should be the focus of political activity. She reasons that the respect we have for people and their choices means that even when we feel confident that we know what a flourishing life is, we would not respect people if we dragooned them into this functioning. The goal of the political process should be to set the stage and allow people to present whatever arguments they have in favour of a given choice, but the choice is up to each individual.

Nussbaum's listing of human capabilities in Appendix 2.1 is used in subsequent chapters.

In the remaining chapters, these issues of measurement are explored further. Chapter 3 shows that some capability data does exist in secondary data sets and uses this data to examine the relationship between satisfaction with life and capabilities. Chapter 4 broadens the data available by developing a survey to identify each capability on Nussbaum's list and with this expanded data set revisits the relationship between satisfaction with life and capabilities. Chapter 5 considers the dynamics of capabilities over time.

Appendix 2.1 Nussbaum's List of Central Human Capabilities

Life.

>Being able to live to the end of a human life of normal length; not dying prematurely, or before one's life is so reduced as to be not worth living.

Bodily Health.

>Being able to have good health, including reproductive health; to be adequately nourished; to have adequate shelter.

Bodily Integrity.

>Being able to move freely from place to place; to be secure against violent assault, including sexual assault and domestic violence; having opportunities for sexual satisfaction and for choice in matters of reproduction.

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Senses, Imagination, and Thought.

> Being able to use the senses, to imagine, think, and reason - and to do these things in a 'truly human' way, a way informed and cultivated by an adequate education, including, but by no means limited to, literacy and basic mathematical and scientific training. Being able to use imagination and thought in connection with experiencing and producing works and events of one's own choice, religious, literary, musical, and so forth. Being able to use one's mind in ways protected by guarantees of freedom of expression with respect to both political and artistic speech, and freedom of religious exercise. Being able to have pleasurable experiences and to avoid non-beneficial pain.

Emotions.

> Being able to have attachments to things and people outside ourselves; to love those who love and care for us, to grieve at their absence; in general, to love, to grieve, to experience longing, gratitude, and justified anger. Not having one's emotional development blighted by fear and anxiety. (Supporting this

capability means supporting forms of human association that can be shown to be crucial in their development.)

Practical Reason.

Being able to form a conception of the good and to engage in critical reflection about the planning of one's life. (This entails protection for the liberty of conscience and religious observance.)

Affiliation.

Being able to live with and toward others, to recognize and' show concern for other human beings, to engage in various forms of social interaction; to be able to imagine the situation of another (Protecting this capability means protecting institutions that constitute and nourish such forms of affiliation, and also protecting the freedom of assembly and political speech.)

Having the social bases of self-respect and non-humiliation; being able to be treated as a dignified being whose worth is equal to that of others. This entails provisions of non-

discrimination on the basis of race, sex, sexual orientation, ethnicity, caste, religion, and national origin.

Other Species.

Being able to live with concern for and in relation to animals, plants, and the world of nature.

Play.

Being able to laugh, to play, to enjoy recreational activities.

Control Over One's Environment

Political. Being able to participate effectively in political choices that govern one's life; having the right of political participation, protection of free speech and association.

Material. Being able to hold property (both land and movable goods), and having property rights on an equal basis with others; having the right to seek employment on an equal basis with others; having the freedom from unwarranted search and seizure. In work, being able to work as a human being, exercising practical reason and

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entering into meaningful relationships of mutual recognition with other workers.

Chapter 3 Operalisation of Nussbaum's List of Capabilities[3]

3.1 Introduction

Chapter 1 discussed two alternatives to income as a measure of welfare namely happiness and capabilities. However, as Sen's second equation in Chapter 2 points out happiness and capabilities are related since individual i's bundle of functionings (b_i) are linked to their utility (v_i) through their valuation function;

$$v_i = v_i(b_i) \qquad \text{equation (2)}$$

If individuals obtain utility from their bundle of functionings, which are in turn derived from their capabilities, it follows that utility will also be a function of that individual's capabilities

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$$u_i = u_i(\mathbf{q}_i)$$

and it is this relationship which is explored in this chapter.

Recent literature e.g Layard (2005), Frey and Stutzer (2002) has tended to concentrate on happiness. However a growing body of work, of which this chapter forms part, (e.g. Bruni et al, 2008) has explored the relationship between happiness and capabilities. One of the reasons for the lack of empirical studies of the capability approach has been the perceived difficulty in identifying suitable empirical measures, of functionings or capabilities and this has led some to question its relevance. Srinivasan (1994), for example, argues that the only conceptually appropriate metrics for valuing functionings and capabilities has to be personalised prices or values, namely, sets of values that are specific to the situation, location, time and state of nature[4]. Although these would vary across individuals in different circumstances, they would have to remain the same for all individuals in the same circumstance, so that they are not subjective and individually based. He concludes that this makes the capability approach

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[4] Srinvasen proposal is, in effect, a connection between the capabilities approach and Debreu's account of general equilibrium

conceptually weak and empirically unsound, involving as it does serious problems of non-comparability over time and space, measurement errors and biases. As a result, Srinvasan argues that meaningful inferences about the process of development and performance as well as policy implications can hardly be drawn from variations in the capability approach based United Nations Human Development Index. Srinvasen makes some good and insightful points though it is worth pointing out that Debreuvian general equilibrium theory is not used as a conceptual basis for empirical work and that a large array of serious measurement problems beset even traditional economic approaches to the measurement of well- being.

The empirical work that has used the capability approach has tended to concentrate on functionings. One example is Martinetti (2000) who used fuzzy set theory to carry out multidimensional assessment of Sen's concept of well-being using data on functionings in Italy. She obtained good results for housing and health but less good results for education and knowledge and social relationships. Martinetti's rationale for evaluating functionings rather than capabilities results from the difficulty she envisaged in obtaining the information required and of the observational problems which would be encountered. Her argument being that the entire capability set of available

options is not easily or directly observable, and so it can only be estimated on a presumptive basis. Separately, Bank of Italy researchers Brandolini and D'Alessio (1998) appear to agree. However, by concentrating on functionings alone, the analysis might do no more than multivariate work on poverty does already and it fails to exploit one of the most distinctive elements of the capabilities approach.

The issue of obtaining suitable measures of capabilities is directly addressed in this thesis and this chapter begins by considering their availability in secondary data.

3.2 Identifying Suitable Capability Measures

Measuring capabilities requires expanding the range of information relevant for assessing people's lives beyond that of their observed achievements or functionings, to the full range of opportunities open to them. Does a low calorie intake reflect a choice, as in the case of fasting or dieting, or is does it reflect a limitation on the quantity of food available. A further problem recognised explicitly by the capability approach is that people may adapt to their life-circumstances, and that such an adaptation

makes subjective feelings as to their well-being inadequate as the sole metric for assessing their quality of life. This issue is addressed in Chapter 5.

To date much of the work on the capability approach (e.g Alkire, 2002a) has focussed on the developing world but it is also relevant to the developed world where its focus on the things necessary in order to be able to live a life we have reason to value is equally important. For that reason this thesis focuses on a developed country the UK. In attempting to identify suitable data the approach was to look for a suitably large sample which contained some questions from which some indication of an individual's capabilities could be inferred. The source chosen is the British Household Panel Survey (BHPS). This is an annual survey of each adult (16+) members of a nationally representative sample of more than 5000 households, comprising approximately 10,000 individual interviews. The survey presents a major collaboration between statisticians and social scientists. It is constantly revised and can reasonably be taken as reflecting good practice in terms of questionnaire design. The main method of data collection at each wave is by face-to-home in-home interviewing. Many, if not most high income countries have similar surveys and it is likely,

therefore, that the methodology could be applied widely to a large range of countries without too much difficulty This chapter draws on data from the 10th wave of the BHPS interviews carried out in the year 2000.

The aim in selecting questions for analysis from this survey was to find items related to those substantive values reflected in Nussbaum's list of capabilities contained in Appendix 2.1 in Chapter 2. Whilst functionings focus on what a person is, or actually chooses to do, capabilities focuses on the set of alternatives she has (her real opportunities). This distinction between functionings and capabilities is not always clear when dealing with real data. However, at least some of the questions in the BHPS do appear to go beyond asking about mere functionings. Two sorts of questions are worth drawing attention to. First, there are those that ask directly about functionings or achievements in particular areas, which clearly will have implications for what can be done in other areas of life. Health status and educational attainments are two examples. Second, there are questions that directly ask about the presence or absence of capabilities in particular dimensions. For example, one question is 'Would you like to pay for a week's annual holiday away from home, but must do without because you cannot afford it?' This exemplifies the merit of the distinction between

functionings and capabilities – a simpler question about whether a person went on holiday or not would be less indicative of capability as some people do not wish to go on holiday every year.[5] It might be thought that this division corresponds to the distinction between instrumental freedom and the intrinsic value of freedom, which has been the subject of some discussion, by philosophers and economic theorists (see for instance Carter (1999[6]). However, one important point to which we shall return is that in practice, questions asked in the BHPS often relate to capabilities and functionings or achievements. Twenty-eight questions with links to Nussbaum's list were identified in the BHPS. Their relationship to the variables used and Nussbaum's account is summarised in Appendix 3.1.

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[5] The way in which such questions are used is similar in spirit to the so-called Leyden school approach to empirical Welfare economics – see for example, van Praag and Frijters (1999).

[6] Carter argues that the relationship between freedom and happiness is an empirical one – though Sen does not. If preferences were perfectly and instantaneously adaptive we might not expect to observe such empirical relations – however the assumption is unrealistic. Furthermore, the existence of an empirical relation does not undermine the value of arguments that point to an analytical relation between freedom and well-being.

The main dependent variable used in the analysis is a self-reported subjective well-being statistic of a kind often used in national social surveys, social psychology and increasingly by economists working on problems of health and labour. The psychometric properties of such measures have been studied exhaustively and will not be further discussed here (though see Argyle (2001) for a review and Clark and Oswald (1994) for a discussion about their use in economics)[7]. Individuals are asked whether they are satisfied (on a scale from 1 to 7) with their life overall. They are also asked whether they are satisfied with; their health, their flat or house, the income of their household, their partner, their job, their social life, the amount of leisure time they have, and with their use of leisure time. These are referred to as satisfaction domains in the following discussion.

The BHPS also includes the 12-question version of the General Health Questionnaire (GHQ) developed by Goldberg (1972) as a screening

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[7] See also Layard (2005) for an overview of the social science literature on happiness and its application to economics. Gerdthan and Johannesson (2001) examine, inter alia, relations between income, happiness and health whilst relations between happiness, income and democratic institutions are discussed in Frey and Stutzer (2000).

test for psychiatric disorder. Respondents answering 'Not at all' or "No more than usual" are normally scored 0 (symptom absent) those answering 'Rather More than usual" or "Much more than usual" are normally scored 1 (symptom present). Those with a score of two or more are more likely to be clinically confirmed cases of psychiatric disorder than those obtaining lower scores although a high percentage of those scoring 2+ turn out to be non-cases. To allow for non-linearity in these ratings, this study uses dummy variables based on a base case for each of these answers rather than this dichotomous scoring.

3.3 Empirical Analysis

Our empirical analysis attempts to measure the effects of the BHPS measures of capabilities and some demographic variables on overall life satisfaction. The difficulty is that there are likely to be consistent personality traits, e.g. a tendency always to look on the bright side, which determine overall satisfaction with life, independent of capabilities. Therefore, there could be serious omitted variable problem. Indeed, a number of researchers have concluded that objective factors (e.g. income), above a certain level, have little impact on satisfaction, and that individual differences in

personality, as well as emotions and cognitive processes are more important. (Diener et al., 1999; Schwarz and Strack, 1999). From one study of the happiness in 1,400 pairs of identical and fraternal twins, for example, Lykken and Tellegen (1996) concluded that the variance in adult happiness is determined about equally by genetic factors and by the effects of experiences unique to each individual. If such personality traits were constant over time and panel data was used such traits could be allowed for by using person specific intercepts. It is not clear that such traits are constant over time and here a single year of the BHPS is being used as a cross-section not a panel.[8]. If there were instruments that influenced capabilities, but not reported satisfaction, Instrumental Variables or Generalised Method of Moment estimators could be used; but such instruments are difficult to find in the data. If the heterogeneity in personality traits were a stable function of observed demographic variables, the effect of the omitted variables could be removed using these, but this seems unlikely. Instead the unobserved personality traits are proxied by measures of satisfaction with a particular area of life. These can then be

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[8] Use of the panel dimension inevitably raises some difficult dynamic issues, which are the subject of the Chapter 5

included in the regression of overall life satisfaction on capabilities, to control for the effect of such personality traits. This assumes that capabilities are uncorrelated with the personality traits. This is a strong assumption; the personality traits may influence how the capabilities are reported

The model is developed in four stages, with each stage being set out before moving on to a detailed discussion of the results in the next section. The dependent variable is overall life satisfaction (rated on a seven point scale, where 7 = completely satisfied and 1 = not satisfied at all.) The unconditional distributions for women and men are given in Table 3.1.

Table 3.1: Female and Male Satisfaction with life

Value	Count	Percent	Cumulative Count	Cumulative Percent
(a) Females				
1	96	1.46	96	1.46
2	143	2.17	239	3.63
3	389	5.91	628	9.53
4	999	15.17	1,627	24.70
5	1,913	29.04	3,540	53.74
6	2,020	30.67	5,560	84.41
7	1,027	15.59	6,587	100.00
(b) Males				
1	50	0.92	50	0.92
2	109	2.00	159	2.92
3	314	5.76	473	8.67
4	787	14.43	1,260	23.11
5	1,754	32.17	3,014	55.27
6	1,767	32.40	4,781	87.68
7	672	12.32	5,453	100.00

The mean overall satisfaction with life is similar for women (5.23) and men (5.21). The dependent variable, overall life satisfaction, for person i, $i = 1,2,$ ... ,N, is denoted as s_i. (this notation does not distinguish between women and men) In the first step, this variable is regressed on individuals' eight satisfaction domains. Two of these domains, satisfaction with partner and satisfaction with job raise an issue, since satisfaction can only be expressed for those with a partner/job and thus is coded as zero. This is dealt with by creating two new variables, which called no-partner and no-job. They take the value one for those without a partner/job, and zero for those with a partner/job. These new variables are added to the eight satisfaction domains to give ten domains a_i i.e. no-partner, no-job and satisfaction with; health, household income, house, social life, amount of leisure time, use of leisure time, job and partner and partner. These ten satisfaction domains are used to give Model 1.

$$s_i = \alpha_1 + \beta_1 a_i + \varepsilon_{1i} \qquad \text{Model (1)}$$

If an individual has a partner, no-partner will be zero and β will measure the effect of their satisfaction with their partner on their satisfaction with life. If they do not have a partner, satisfaction with partner will be zero and no-partner will be one and in this case β will measure the effect of not having a

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partner on their satisfaction with life, similarly where the individual does not have a job.

The estimates for model 1, which are given in Table 3.2, will suffer endogeneity bias since both the error term and the regressors include the personality traits. To allow for this it is assumed that the value of the ten domains (a_i) is determined by the measured capabilities (q_i) and the personality traits (p_i). These personality traits are the residuals from:

$$a_{ki} = \alpha_k + \phi_k q_i + p_{ki} \qquad (k=1,...10) \qquad \text{equation (3.1)}$$

The estimates for these 10 equations are not reported, but are available[9]. These regressions are used to decompose the ten satisfaction domains into that part explained by capabilities ($\hat{a}_{ki}$) and the part not explained by capabilities ($\hat{p}_{ki}$). The ten residuals then form our 10 x 1 vector of personality traits $\hat{p}_i$.

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[9] A linear probability model rather than logit or probit was used to predict the dummy variables for having a partner or having a job, but Angrist and Kreuger (2001) suggest that this is more robust to functional form misspecification

Table 3.2: Model 1 Satisfaction with Life and Satisfaction Domains

	Coefficients	
Variable	Females	Males
Constant	0.060	0.226
	(0.081)	(0.082)
No Job	0.409	0.635
	(0.058)	(0.056)
No Partner	1.009	0.559
	(0.073)	(0.079)
Satisfaction with		
Health	0.185	0.165
	(0.008)	(0.008)
House	0.078	0.088
	(0.008)	(0.009)
Household Income	0.082	0.092
	(0.008)	(0.008)
Partner	0.202	0.123
	(0.011)	(0.012)
Job	0.074	0.128
	(0.010)	(0.010)
Social Life	0.202	0.201
	(0.011)	(0.012)
Leisure Activities	0.144	0.183
	(0.012)	(0.011)
Amount of Leisure	0.045	0.001
	(0.010)	(0.010)
Adjusted R^2	0.55	0.58
Log-likelihood	-8439.471	-6440.05
Akaike info criterion	2.57	2.37
Schwarz info criterion	2.58	2.38

Note: Standard errors in parenthesis; significant at 5% in bold

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Table 3.3: Correlation Matrix of residual (personality traits)

| Males | Females | | Satisfaction with | | | | Leisure | | Leisure | Social |
| | No | | Household | | | | | | | |
	No Job	No Partner	Health	Income	House	Job	Activities	Partner	Amount	Life
No Job	1.00	0.13	0.00	0.03	0.10	-0.09	0.13	-0.11	0.24	0.03
No Partner	0.12	1.00	0.03	0.00	0.04	-0.14	0.03	-0.94	0.07	-0.03
Satisfaction with										
Health	0.00	0.00	1.00	0.25	0.18	0.05	0.21	0.01	0.16	0.22
Household Income	0.00	0.03	0.28	1.00	0.34	0.05	0.23	0.04	0.23	0.26
House	0.11	-0.02	0.21	0.34	1.00	-0.04	0.28	0.03	0.29	0.27
Job	-0.86	-0.12	0.08	0.16	-0.02	1.00	-0.05	0.14	-0.15	0.06
Leisure Activities	0.17	0.02	0.24	0.25	0.30	-0.05	1.00	0.03	0.67	0.66
Partner	-0.09	-0.94	0.03	0.00	0.08	0.11	0.04	1.00	-0.01	0.10
Leisure Amount	0.32	0.07	0.19	0.25	0.25	-0.17	0.06	-0.01	1.00	0.53
Social Life	0.07	-0.01	0.27	0.31	0.30	0.07	0.61	0.09	0.53	1.00

The measures of personality traits are of interest in their own right. Table 3.3, gives the correlation matrix between them. If there were common personality traits, which explained satisfaction with particular areas of life, independent of the observed capabilities, then they would be highly correlated across areas of life. This does not seem to be the case.

In stage 2, our measures of personality traits $\hat{p}_i$ to are added to model (1) to give model (2):

$$s_i = \alpha_2 + \beta_2 a_i + \gamma \hat{p}_i + \varepsilon_{2i} \qquad \text{Model 2}$$

The estimates are given in Table 3.4. This form of the equation is the standard way of implementing a Hausman (1978) test for the exogeneity of a_i. Under the null hypothesis, that the a_i are exogenous, $\gamma = 0$, and this can be tested.

Since $a_{ki} = \hat{a}_{ki} + \hat{p}_{ki}$ (from equation 3.2) the right hand side of model (2) can also be written in terms of the predicted and the unpredicted components of the satisfaction domains to give:

$$s_i = \alpha_2 + \beta_2 \hat{a}_i + (\beta_2 + \gamma) \hat{p}_i + \varepsilon_{2i}$$

Under the alternative hypothesis that the a_i are not exogenous $(\beta_2 + \gamma) = 0$ and the estimates of β_2 are asymptotically equivalent to the two stage least

Table 3.4: Model 2 Satisfaction with Life, Satisfaction Domains, and Personality Traits

	Coefficients	
	Females	Males
Constant	-5.345	-2.494
	(0.378)	(0.393)
No Job	1.016	1.325
	(0.330)	(0.242)
No Partner	6.477	2.497
	(0.498)	(0.557)
Satisfaction with		
Health	0.249	0.094
	(0.024)	(0.034)
House	-0.076	-0.010
	(0.038)	(0.042)
Household Income	0.153	0.020
	(0.044)	(0.044)
Partner	1.074	0.415
	(0.076)	(0.080)
Job	0.094	0.310
	(0.065)	(0.038)
Social Life	0.555	0.502
	(0.078)	(0.077)
Leisure Activities	-0.021	0.162
	(0.122)	(0.082)
Amount of Leisure	-0.181	-0.036
	(0.080)	(0.060)
Personality Traits		
No Job	-0.677	-0.792
	(0.335)	(0.248)
No Partner	-5.617	-2.046
	(0.503)	(0.562)
Health	-0.127	0.030
	(0.025)	(0.035)
House	0.149	0.094
	(0.039)	(0.043)
Household Income	-0.088	0.064
	(0.044)	(0.045)
Partner	-0.898	-0.308
	(0.077)	(0.081)
Job	-0.038	-0.213
	(0.066)	(0.040)
Social Life	-0.387	-0.333
	(0.079)	(0.077)
Leisure Activities	0.151	-0.007
	(0.122)	(0.083)

Table 3.4: Model 2 Satisfaction with Life, Satisfaction Domains, and Personality
Traits

	Coefficients	
	Females	Males
Personality Traits (contd.)		
Amount of Leisure	**0.217**	0.043
	(0.081)	(0.061)
Adjusted R^2	0.60	0.61
Log-likelihood	-8093.68	-6226.69
Akaike info criterion-	2.46	2.29
Schwarz info criterion	2.49	2.32

Note: Standard errors in parenthesis; significant at 5% in bold

squares estimates. This model embodies the restriction, similar to some rational expectations models, that the only way that capabilities influence overall satisfaction with life is through their influence on satisfaction in particular areas of life

In the third stage this restriction is relaxed by replacing the predicted values for each satisfaction domain $\hat{a}_i$ by the capability indicators using equation 3.2 where $\hat{a}_{ki} = \alpha_k + \hat{\phi}_k \, q_i$ to give model (3):

$$s_i = \alpha_3 + \beta_3 q_i + \gamma_3 \hat{p}_i + \varepsilon_{3i} \qquad \text{Model 3}$$

This is the unrestricted equation and the estimates are given in Table 3.5. The model measures the effects of capabilities on overall life satisfaction with the addition of our constructed controls for personality

Table 3.5: Model 3 Satisfaction with Life, Capabilities, and Personality Traits

| | Coefficients | |
	Females	Males
Constant	**4.518**	**4.284**
	0.085	(0.103
Bodily Health		
Health Limits activities	**-0.325**	**-0.259**
	0.040	(0.045
Adequately nourished	**0.175**	**0.246**
	0.077	(0.091
Adequate Shelter	**-0.278**	**-0.301**
	0.025	(0.025
Bodily Integrity		
Access to a car	-0.025	**0.069**
	0.023	(0.027
Crime In Area	0.049	**0.073**
	0.027	(0.028
Senses Imagination and Thought		
A level and above	**-0.127**	**-0.158**
	0.022	(0.021
Emotions	.	
Able to Concentrate		
better than usual	**-0.108**	0.035
	0.048	(0.047
less than usual	**-0.089**	-0.022
	0.032	(0.036
much less than usual	0.069	0.160
	0.073	(0.095
Not Able to Sleep		
not at all	**0.128**	**0.088**
	0.027	(0.026
more than usual	0.014	0.047
	0.032	(0.038
much more than usual	-0.086	-0.011
	0.066	(0.085

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Table 3.5: Model 3 Satisfaction with Life, Capabilities, and Personality Traits

	Coefficients	
	Females	Males
Emotions (contd.)		
Being Under Strain		
not at all	**0.158**	**0.145**
	0.032	(0.029
more than usual	**-0.099**	**-0.121**
	0.030	(0.031
much more than usual	**-0.320**	**-0.282**
	0.067	(0.077
Being Depressed		
not at all	**0.290**	**0.252**
	0.029	(0.028
more than usual	**-0.125**	**-0.158**
	0.035	(0.039
much more than usual	**-0.189**	**-0.439**
	0.073	(0.091
Losing Confidence		
not at all	**0.119**	**0.136**
	0.028	(0.029
more than usual	0.039	-0.016
	0.038	(0.047
much more than usual	**-0.191**	0.125
	0.095	(0.134
Practical Reason		
Able to Make Decisions		
more than usual	**-0.093**	-0.042
	0.037	(0.036
less than usual	-0.030	-0.025
	0.042	(0.052
much less than usual	0.178	0.147
	0.100	(0.147)
Able to overcome difficulties		
not at all	**0.062**	**0.058**
	(0.028)	(0.027)
more than usual	**-0.122**	-0.031
	(0.039)	(0.042)
much more than usual	**-0.250**	0.173
	(0.086)	(0.119)

Table 3.5: Model 3 Satisfaction with Life, Capabilities, and Personality Traits

	Coefficients	
	Females	Males
Practical Reason (contd.)		
Able to Resolve Problems		
more than usual	**-0.126**	-0.036
	(0.041)	(0.040)
less than usual	-0.057	-0.022
	(0.043)	(0.052)
much less than usual	-0.075	**-0.336**
	(0.103)	(0.144)
Affiliation		
Able to holiday	**0.218**	**0.215**
	(0.030)	(0.033)
Able to buy new clothes	**0.123**	-0.047
	(0.056)	(0.067)
Able to entertain	**0.291**	**0.248**
	(0.050)	(0.055)
Feeling Worthless		
not at all	**0.228**	**0.348**
	(0.027)	(0.030)
more than usual	**-0.203**	-0.049
	(0.048)	(0.060)
much more than usual	**-0.555**	**-0.324**
	(0.105)	(0.166)
Playing a useful Role		
more than usual	**0.029**	0.107
	(0.034)	(0.036)
less than usual	**-0.157**	-0.156
	(0.038)	(0.042)
much less than usual	**-0.330**	-0.095
	(0.081)	(0.100)
Play		
Feeling Happy		
more than usual	**0.155**	**0.211**
	(0.034)	(0.035)
less than usual	**-0.384**	**-0.395**
	(0.042)	(0.048)
much less than usual	**-0.750**	**-0.970**
	(0.093)	(0.125)

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Table 3.5: Model 3 Satisfaction with Life, Capabilities, and Personality Traits

	Coefficients	
	Females	Males
Able to Enjoy Activities		
more than usual	0.078	0.001
	(0.043)	(0.041)
less than usual	-0.043	**-0.226**
	(0.034)	(0.036)
much less than usual	**-0.473**	**-0.428**
	(0.077)	(0.086)
Control Over One's Environment		
Able to vote	-0.017	0.054
	(0.041)	(0.041)
Health Limits Work		
Yes	0.017	-0.026
	(0.062)	(0.065)
prevents work	**-0.666**	-0.171
	(0.151)	(0.138)
a lot	-0.057	-0.117
	(0.084)	(0.096)
a little	**0.143**	**0.147**
	(0.063)	(0.071)
somewhat	0.023	0.070
	(0.070)	(0.075)
Personality Traits		
No Job	**0.339**	**0.533**
	(0.056)	(0.056)
No Partner	**0.859**	**0.451**
	(0.069)	(0.076)
Satisfaction with		
Health	**0.122**	**0.124**
	(0.008)	(0.009)
House	**0.073**	**0.0834**
	(0.008)	(0.009)
Household Income	**0.065**	**0.084**
	(0.008)	(0.008)
Partner	**0.176**	**0.107**
	(0.011)	(0.011)
Job	**0.056**	**0.097**
	(0.010)	(0.010)

Table 3.5: Model 3 Satisfaction with Life, Capabilities, and Personality Traits

	Coefficients	
	Females	Males
Satisfaction with (contd.)		
Social Life	**0.168**	**0.169**
	(0.010)	(0.011)
Leisure Activities	**0.130**	**0.156**
	(0.011)	(0.011)
Leisure Amount	**0.036**	**0.007**
	(0.010)	(0.009)
Adjusted R^2	0.61	0.62
Log-likelihood	-7937.54	-6146.79
Akaike info criterion	2.43	2.28
Schwarz info criterion	2.49	2.35

Note: Standard errors in parenthesis; significant at 5% in bold

traits. Given that the a_i are correlated with the unobserved personality traits included in ε_{3i}, the coefficients of a_i will not be consistently estimated, but the coefficients of q_i should be.

In the final model the personality traits are removed from Model 3 our capability indicators are simply regressed on satisfaction with life giving model 4.

$$s_i = \alpha_4 + \beta_4 q_i + \varepsilon_{3i} \qquad \text{Model (4)}[10]$$

A comparison of models 3 and 4 will indicate whether the measure of personality traits adds anything to the explanation of overall satisfaction.

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[10]Detailed results for model 4 are not presented here for reasons of space

Table 3.6: Model Comparison

		R^2	Maximised Log Likelihood	Parameters	Schwarz Bayesian Information Criterion
Females					
	Model 1	0.55	-8439.47	11	2.577146
	Model 2	0.60	-8093.68	21	2.485502
	Model 3	0.62	-7937.54	62	2.492824
	Model 4	0.37	-9579.22	52	2.977937
Males					
	Model 1	0.58	-6440.05	11	2.379378
	Model 2	0.61	-6226.69	21	2.316900
	Model 3	0.62	-6146.79	62	2.352287
	Model 4	0.35	-7629.79	52	2.880431
Females		Likelihood Ratio	Degrees of Freedom	Critical Value	Probability
Model 2 v Model 1		691.59	10	18	0.0000
Model 3 v Model 2		312.28	41	57	0.0000
Model 3 v Model 4		3283.37	10	18	0.0000
Males					
Model 2 v Model 1		426.73	10	18	0.0000
Model 3 v Model 2		159.80	41	57	0.0000
Model 3 v Model 4		2966.01	10	18	0.0000

Table 3.6 gives R^2, Maximised Log-Likelihoods, number of parameters, and Schwarz Bayesian Information Criterion (SBC) for the four models. Model 3 nests the other three models, though Model 4 is not nested with Model 1 and Model 2. Likelihood Ratio tests between the models are straightforward. The capability indicators on their own (model 4) have much less explanatory power than models that include the satisfaction domains, as would be expected if personality traits are important. On the other hand, use of the capability indicators, either directly or as predictors of the satisfaction

domains, does significantly improve the fit. On these numbers, all the restrictions are rejected massively by likelihood ratio tests, leading to a preference for the unrestricted Model 3 (capabilities and personality traits) and it is this model, which is used in the discussion of the results in the next section[11]. The next section begins by discussing some of the results from modelling the effect of capabilities (equation 3.1) and personality traits (model 3) on the satisfaction domains before going on to discuss the impact of capabilities on satisfaction with life.

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[11] With samples as large as this, LR tests may not be appropriate and alternative model selection criteria such as the Schwarz Bayesian Information Criteria, (Schwarz, 1978) which increases the penalty on the number of parameters with the log of the sample size, may be more appropriate. On this basis model 2 (satisfaction domains and personality traits) which indicates that the restriction that capabilities act through the satisfaction domains would be chosen, however this has much less explanatory benefit when considering the impact of capabilities on satisfaction with life.

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3.4 Discussion of Results

3.4.1 Capabilities and having a job

We can see the impact of the level of capabilities on whether an individual has a job or not from the regression intercepts, for the no-job dummy variable. This gives the expected probability of having a job when all the capability variables are zero (not having that capability). With no capabilities, women are 76% likely to not have a job whereas men are only 68% likely not to have a job.

3.4.2 Capabilities and having a partner

Similarly with no capabilities women are 74% likely to not have a partner and men 50% likely to not have a partner.

3.4.3 Capabilities and base level of domain satisfaction

The base level of satisfaction for a domain is also given by the regression intercepts for each of the domains in the absence of any of the capability variables. The base level is above the midpoint of the 1–7 scale for, health (4.94 for men, 4.78 for women), house or flat (4.06 for men,

4.63 for women), social life (3.98 for men, 3.82 for women), use of leisure

(4.53 for men, 4.03 for women) and quantity of leisure (4.67 for men, 4.09

for women). For household income, it is below the halfway point (2.36 for

men, 2.53 for women). Those with a job and those with a partner have a

base level of satisfaction higher than those without. The base level of

satisfaction for those with a partner is 2.68 for men and 1.48 for women,

whereas for those without a partner the figures are 0.74 for women and 0.68

for men. The base level of satisfaction for those with a job is 1.33 for men

and 1.13 for women, but 0.76 for women and 0.50 for men for those without

a job.

3.4.4 Personality traits and satisfaction domains.

The personality traits (proxied by the residuals from equation3.1)

have an impact on the majority of the satisfaction domains. Those

determining whether you have a partner or not are particularly strong for

women (coefficient 0.86) but less so for men (coefficient 0.45), in contrast

the effect of those personality traits which determine whether you have a job

or not is stronger for men (coefficient 0.53) than for women

(coefficient0.43). Personality traits have a stronger but moderate effect on

satisfaction with partner, for women than for men (coefficient0.18 compared to 0.11) but a stronger effect on satisfaction with use of leisure for men than women (coefficient0.16 vs. 0.13). The effect of personality on satisfaction with social life and health is similar for both men and women (coefficients 0.17 and 0.12) but its impact on satisfaction with house, household income and job is small (coefficient<0.08) for women although slightly larger for men (coefficient<0.10 of a point). There is no statistically significant effect (at the 5% level) of personality on satisfaction with quantity of leisure for men and little for women (coefficient0.04).

3.4.5 Impact of capabilities on satisfaction domains.

We now turn to the effect of capabilities on satisfaction with life and the satisfaction domains by examining the impact of the items from Nussbaum's list of capabilities.

Bodily health.

The results confirm Veenhoven's (1994) finding that there is a relation between satisfaction with life (which he refers to as happiness) and having specific illnesses, especially where this restricts activity. Poor health

such that it limits an individual's ability to carry out their daily activities reduces overall satisfaction (by around 0.32 for women, on our scale of 1–7, and by 0.26 for men). For men the largest impact is on satisfaction with health but the lack of good health also has a negative effect on all the satisfaction domains other than satisfaction with partner where it has a positive effect but not significantly so (at the 5% level). Poor health reduces the probability of having a job but it increases the probability of having a partner but not significantly so. For women the largest impact is also on satisfaction with health and there is a significant negative impact on satisfaction with household income, job, social life and use of leisure. Again, health, which limits women's ability to carry out their daily activities, has a positive but not significant impact on their satisfaction with their partner, as with men this perhaps indicates that those with poor health are slightly more dependent on their partner.

The answers to the questions on whether the respondents in the BHPS eat meat, chicken or fish, every second day and if not whether this is because they cannot afford to, have been used as a measure of their capability to be adequately nourished. The effect on overall satisfaction is positive (coefficient 0.17 for women, 0.25 for men). For both women and

men being able to be adequately nourished has a positive effect on satisfaction with their household income (coefficient 0.35 for women, 0.41 for men). Well nourished women are almost a point more satisfied with their partner and are 15% more likely to have one. There is no such significant effect for well nourished men. However, the significance of this result is limited by the low number of respondents (81 males and 134 females) not able to afford meat, chicken or fish every second day but who would like to.

The BHPS asks if respondents would like to move house and follows this up by asking those who reply "yes" if they expect to move. These results have been combined to identify those who would like to move but do not expect to do so and this is used as a proxy for being able to be adequately sheltered. Whilst the effect on overall satisfaction, on a scale of 1–7, is negative (coefficient 0.28 for women, 0.30 for men), there is a positive effect, for both men and women, on satisfaction with partner (not significant for women) and with job which perhaps indicates that a satisfying job and satisfying relationship with one's partner may limits people's choices. The overall negative effect results from the effect on, satisfaction with, health, house or flat, household income, social life and use and quantity of leisure.

Bodily integrity.

Whether or not the respondents had the use of a car or van was used as a proxy for an individual's ability to move freely. For men this had a small (coefficient 0.7) positive effect on overall satisfaction but a negative effect on satisfaction with social life (coefficient0.10), use of leisure (coefficient 0.12), and amount of leisure (coefficient 0.32). For women the overall effect was not significant (although negative), however it did have a positive effect on their satisfaction with their partner, and their job but a negative effect on their satisfaction with their use and quantity of leisure.

The BHPS identifies whether there is vandalism or crime in the area of those surveyed, however it does not give any information on the nature of the crime so it is not possible to say whether this includes sexual and domestic violence. The absence of crime has a small positive effect (coefficient 0.07) for men but an insignificant effect for women on overall satisfaction. This finding is in contrast to Veenhoven (1997) who found a strong correlation between happiness and the murder rate and lethal accidents in a country. There is a positive effect (coefficient 0.4 for men, 0.37 for women) on satisfaction with house or flat. There is also a positive effect on satisfaction with household income and job (not significant for

women), which could indicate that those with a higher household income and better job live in more crime free areas. There was no data available from the survey to investigate whether the respondents had freedom in the opportunities for sexual satisfaction or in choices in matters of reproduction. Veenhoven (1997) found that acceptance of homosexuality and prostitution was strongly correlated with happiness.

Senses, imagination, and thought.

A dummy variable for those with an education of 'A' levels and above was constructed to allow the effects of education on satisfaction to be measured. On the basis of the BHPS data having a higher education reduces overall satisfaction for both women and men (coefficient0.13 for women, 0.16% for men). These results confirm the findings of Veenhoven (1997) who suggests that the relative unhappiness of the highly educated may be due to a lack of jobs at the appropriate level and to the fading of earlier advantages in the process of social equalizing. Clark and Oswald (1996) also found that education had a clear negative effect, when income and occupation are held constant, which they argue is the result of raised expectations. Argyle (2001) argues that education has weak effects on well-

being, mainly through the effect it has on occupation and income. This is also reflected in our findings that a higher level of education does go with a higher level of satisfaction with job and by the positive effect on satisfaction with household income. The coefficient on satisfaction with job is 0.42 for men and 0.77 for women and the coefficient for satisfaction with household income for men is 0.14 and for women 0.08. The overall negative effect arises from the negative, effects on satisfaction with house, social life, and quantity and use of leisure. This may indicate that the choices an individual makes in choosing how to use her capabilities makes a difference to overall satisfaction, jobs that are more satisfying may come at the expense of one's leisure and social life.

There is no data available from the BHPS to investigate the other areas of this capability although the data on the capability for play (see below) gives some insight into the ability to have pleasurable experiences.

Emotions.

There is a strong relationship between the variables reflecting fear and anxiety and overall satisfaction. Not losing sleep through worry, not feeling constantly under strain, not feeling unhappy or depressed, and

having confidence in oneself all have a positive effect on men and women's overall satisfaction with life. In contrast being constantly under strain, and feeling unhappy or depressed, have a negative effect on overall satisfaction.

Being able to concentrate does not have a significant effect on overall satisfaction of men although being less able than usual to concentrate has a negative effect on women's overall satisfaction. Being able to concentrate less has a negative effect on satisfaction with health, for both men and women.

As is to be expected not losing sleep over worry has a modest (coefficient 0.09 for men and 0.13 for women) positive effect on overall satisfaction. Losing rather more sleep than usual has a positive effect for women and men but in neither case is the effect on overall satisfaction significant. The only significant effect is on satisfaction with social life and satisfaction with use of leisure for men, suggesting that losing some sleep is the price that men pay for being satisfied with their social life. Losing much more sleep than usual has a negative although not significant effect on overall satisfaction for both men and women. Worryingly the effect, for men, of losing much more sleep than normal on satisfaction with their job is

positive and fairly strong (coefficient 0.56), perhaps illustrating that more satisfying male jobs are more demanding.

As is to be expected not being constantly under strain has a positive effect (coefficient 0.14 for men, 0.16 for women) on overall satisfaction whereas being rather more, or much more under strain has a negative effect (coefficient 0.12 and 0.28 for men, 0.10 and 0.32 for women, respectively). The effect of not being constantly under strain has a strong (coefficient 0.30 for men and 0.24 for women) negative effect on satisfaction with partner but being rather more or much more under strain has no significant effect indicating perhaps there is less need for emotional support when not under strain. Not being under strain has a very strong (coefficient 0.82 for men 0.56 for women) negative effect on satisfaction with job but again being rather more or much more under strain has no significant effect, indicating perhaps that in order for a job to be satisfying, employees need to feel under some strain.

Understandably not feeling unhappy or depressed has a positive effect on satisfaction with all elements of satisfaction, but it reduces the probability of having a partner slightly (by 4% for both women and men) and of men having a job (but not significantly so). It has a positive effect on

overall satisfaction (coefficient0.25 for men and 0.29 for women) with that on satisfaction with partner (coefficient0.40 for both) being particularly strong. Feeling rather more, or much more, unhappy or depressed has a negative effect on overall satisfaction with the effect being strongest (coefficient 0.44 for men 0.19 for women compared to 0.16 and 0.13) for those who are feeling much more unhappy or depressed.

Those who have not been losing confidence in themselves have a higher level of overall satisfaction (coefficient 0.14 for men and 0.12 for women). The effects are positive on all areas of satisfaction (other than quantity of leisure for men) and there is a positive effect on the probability of having a partner and a job. The effect of recently losing rather more or much more confidence on overall satisfaction is not significant for men but there is a negative effect (coefficient 0.20) on recently losing much more confidence for women.

Practical reason.

Being able to overcome your difficulties has a small (coefficient 0.06 for men and women) positive impact on overall satisfaction. Although being more capable of making decisions has no significant effect on men's

overall satisfaction it has a small negative effect (coefficient 0.09) on women's overall satisfaction perhaps as a result of facing up to the consequences of their decisions. A point reinforced by the negative effect (coefficient 0.13) that being more able to face up to problems has on overall satisfaction. For men, being more able to face up to problems has no significant effect on overall satisfaction however, for those who are much less able to face up to problems, the effect on overall satisfaction is significantly negative (coefficient 0.34). There is no significant effect on overall satisfaction as a result of men feeling that they couldn't overcome their difficulties but for women the effect is negative (coefficient 0.12) and strongly so (coefficient 0.25) where this is much more so than usual.

For men being more capable of making decisions than usual has a positive effect on satisfaction with employment and being much less able to make decisions has a positive effect on satisfaction with household income. The effect on satisfaction with health and on satisfaction with household income of men being able to overcome their difficulties is positive but there is no significant effect on the other elements of overall satisfaction. Finally, it is worth noting that being more able to face up to problems has a significantly positive effect (coefficient 0.62) on satisfaction with job

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whereas being less able or much less able to face up to problems has a significantly negative effect (coefficients 0.38 and 1.02) on satisfaction with partner.

Affiliation.

Those who would like to, go on holiday, buy new rather than second hand clothes, or have friends or family for a drink or meal once a month but could not do so because they could not afford to, are identified in the BHPS. This allowed the effects of people being able to engage in social interaction to be investigated. Being able to go on holiday or have friends or family round had a positive effect on overall satisfaction (coefficient 0.21 and 0.25 for men, 0.22 for women and 0.29 for women respectively,) however being able to buy new clothes had a negative but not significant effect for men whilst for women it had a significant positive effect (coefficient 0.12). The elements of satisfaction on which women being able to buy new clothes had a significant positive effect were satisfaction with household income, partner, job, and social life.

The ability "to be treated as a dignified being whose worth is equal to that of others" was measured using the responses to the questions, "Have

you recently... been thinking of yourself as a worthless person?" and "have you recently felt that you were playing a useful part in things?". Not thinking of oneself as a worthless person has a strong effect (coefficient 0.35 for men 0.23 for women), on overall satisfaction. The positive effect is felt on all elements of satisfaction. It also has a positive effect on the probability of having a job or a partner. For both men and women the negative effect on overall satisfaction of thinking of oneself as a worthless person much more than usual is strong (coefficients 0.32 and 0.55) but there is a positive impact on the probability of having a job or partner. The effect on satisfaction with health, house, household in- come, social life, and use of leisure, is negative whereas the effect on satisfaction with partner and job is positive for men and women.

For men who feel that they have been playing a more useful part in things than usual, the effect on overall satisfaction is positive (coefficient 0.11) whereas for women there is no significant effect. For both men and women the effect is particularly strong (coefficient 0.47 for men, 0.41 for women) on satisfaction with job but it is not significant for the other elements of satisfaction. For men feeling that an individual has been playing less of a useful role has a significantly negative impact on satisfaction with

household income, job, social life and the probability of them not having a job. The satisfaction of women, who feel that they have been playing less of a useful role, with their partner, job, and social life, is significantly less, as is the probability of them having a job or a partner. This effect is accentuated for those feeling that they have been playing much less of a useful part in things.

Play.

The responses to the questions, "Have you recently been feeling reasonably happy, all things considered?" and "Have you recently been able to enjoy your normal day to day activities?" give the results to be expected for men. Being more happy than usual has a positive effect (coefficient 0.21) on overall satisfaction whilst being less or much less happy than usual has a negative effect (coefficients 0.40 and 0.97). Men who are more happy than usual are more satisfied with their job (coefficient 0.25), their partner (coefficient 0.31) and their social life (coefficient 0.13). Whilst being less happy than usual has a negative effect on satisfaction with household income (24% of a point), social life (26% of a point), and use of leisure (35% of a point) it has a positive effect (5%) on the possibility of having a

job. Being much less happy than normal has a negative effect on satisfaction with health (coefficient 0.62), social life (coefficient 0.45), and use of leisure (coefficient 0.59) but a positive effect (coefficient 0.18) on the possibility of having a job and of being satisfied with it (coefficient 0.75).

Being able to enjoy day-to-day activities more than usual has no significant effect on overall satisfaction of men but being less able and much less able to enjoy day-to-day activities reduces overall satisfaction (coefficients 0.23 and 0.43). This is mainly as a result of the negative effect on satisfaction with health, (coefficients 0.26 and 0.42), social life (coefficients 0.39 and 0.44), use of leisure (coefficients 0.28 and 0.40), and quantity of leisure (coefficients 0.38 and 0.48). The effect on women is similar, feeling more happy than usual has a positive effect on overall satisfaction (coefficient 0.15) whilst being less happy or much less happy has a negative effect (coefficients 0.38 and 0.75). There is a positive effect on women who are more happy than usual on the probability of their having a job (coefficient 0.7), satisfaction with their partner (coefficient 0.26), and their job (coefficient 0.34), but a negative effect on their satisfaction with their house. Women who are less happy than usual are 13% more likely to have a job and to get more satisfaction from it (coefficient 0.44) but be less

satisfied with their house (coefficient 0.16), and amount of leisure (coefficient 0.18). For those who are much less happy than usual, there is a significant effect on their social life (50% of a point). The effect on satisfaction of enjoyment of day-to- day activities by women is not significant other than for those who have been able to enjoy these activities much less than usual where it reduces overall satisfaction (coefficient0.47). This effect is significant on satisfaction with health (coefficient 0.61), house (coefficient 0.30), social life (coefficient 0.61) use of leisure (coefficient 0.67), and amount of leisure (coefficient 0.65).

Control over one's environment.

Although everyone in Britain over 18 has the right to vote, the survey identifies 545 males and 604 females who for whatever reason could not vote in the last general election. However, the effect on overall satisfaction for both men and women of not being able to vote was not significant.

One of the limitations to an individual seeking employment on an equal basis is where their health limits the type or amount of work that they can do. The BHPS data show that for men there is no significant effect on

their overall satisfaction where an individual's health limits the type of work they can do but for females there is a significant negative effect (coefficient 0.66) where their health prevents them form doing any type of work. Where an individual's health limits the amount of work they can do a little there is only a significant reduction in overall satisfaction where their health limits the amount of work they can do a little (coefficient 0.15 for men and 0.14 for women). Satisfaction with health is reduced for both men and women where the state of their health prevents them from doing some types of work (coefficient 0.35 for men, 0.34 for women). Where health prevents an individual from doing any work, there is a positive effect on satisfaction with house (coefficient 0.49 for men 0.50 for women) and a negative effect on satisfaction with health (coefficient 0.92 for men, 1.63 for women). Women also suffer a negative effect on their satisfaction with partner (coefficient 1.26), social life (coefficient 0.90) use of leisure (coefficient0.87).

3.5 Conclusion

Using data from the British Household Panel Survey in conjunction with a list of substantial values posited by Martha Nussbaum has facilitated

the operationalisation and testing of the capability approach. Specifically, it suggests that commonly used secondary data sources do provide some information about the capabilities people have and that this can be incorporated into models of (subjective) well-being such as those used by a growing number of labour and health economists. A wide range of capabilities exhibit a statistically significant relationship to well-being, a relationship which is complex and slightly different for men and women.

The main empirical point to emerge from our analysis is that capabilities do matter – strong evidence that capabilities do influence well-being was found. The constructed proxy for personality traits does impact on well-being, and may influence capabilities, but even when personality traits were controlled for the same result was obtained – capabilities are significantly related to well-being.

If taken at face value these findings would argue against Nussbaum's contention that we cannot satisfy the need for one capability by being giving a larger amount of another one – some capabilities have a bigger impact on well-being than others. However, this is of course a consequence of the functional form chosen for the model and further work on different models may lead to a different conclusion. A valid criticism of

these findings is that the measures of capabilities may in fact be measures of functionings. This partly results from the circular nature of the relationship. Is 'health which limits your activities' a capability in that it restricts the potential choices you can make, or is it rather a functioning, the result of the choices you made from your capability set to e.g. to smoke or drink? In determining the variables to be used as capability measures the strategy was to focus on those which do influence an individual's choice set. Perhaps the answer lies in Nussbaum's point that what people choose to do, should not be the focus of policy makers but rather that enhancing the choice set available to everyone (even smokers and the obese) should be.

Appendix 3.1 Variable names, BHPS questions and relationship to Nussbaum's List of Capabilities

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Capability: Bodily Health

Health limits activities

"Does your health in any way limit your daily activities compared to most people of your age?"

Adequately nourished

"Here is a list of things which people might have or do. Please look at this card and tell me which things you (and your household) have or do? Eat meat, chicken, fish every second day."

Those who answer no– "Would you like to be able to eat meat, chicken, fish at least every second day, but must do without because you cannot afford it?'

Adequate shelter

"If you could choose, would you stay here in your present home or would you prefer to move somewhere else?"

For those answering 'Prefer to move'

"(Even though you may not want to move) Do you expect

Appendix 3.1 Variable names, BHPS questions and relationship to Nussbaum's List of Capabilities

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you will move in the coming year?''

Capability: Bodily Integrity

Access to a car

"Do you normally have access to a car or van that you can use whenever you want to?''

Crime in area

'Does your accommodation have any of the following problems? Vandalism or crime in the area''

Capability : Senses, Imagination, and Thought

Educated to A level or above

Generated from a derived variable giving the highest educational qualification

Capability: Emotions

Able to Concentrate

"Have you recently ... been able to concentrate on whatever you are doing?"

Appendix 3.1 Variable names, BHPS questions and relationship to Nussbaum's List of Capabilities

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Not Able to sleep

"Have you recently ...lost much sleep over worry?

Being under strain

"Have you recently ... felt constantly under strain?"

Being depressed

"Have you recently ... been feeling unhappy or depressed?"

Losing confidence

"Have you recently ... been losing confidence in yourself?"

Capability: Practical Reason

Able to make decisions

"Have you recently...felt capable of making decisions about things?"

Able to overcome difficulties

"Have you recently... felt you couldn't overcome your difficulties?"

Able to resolve problems

"Have you recently... been able to face up to problems?'

Appendix 3.1 Variable names, BHPS questions and relationship to Nussbaum's List of Capabilities

Capability: Affiliation

Able to holiday

> "Here is a list of things which people might have or do. Please look at this card and tell me which things you (and your household) have or do? Pay for a week's annual holiday away from home."

> "Would you like to be able to pay for a week's annual holiday away from home, but must do without because you cannot afford it?"

Able to buy clothes

> "Here is a list of things which people might have or do. Please look at this card and tell me which things you (and your household) have or do? Buy new, rather than second hand, clothes."

> "Would you like to be able to buy new, rather than second hand, clothes, but must do without because you cannot afford it?"

Appendix 3.1 Variable names, BHPS questions and relationship to Nussbaum's List of Capabilities

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Able to entertain

"Here is a list of things which people might have or do. Please look at this card and tell me which things you (and your household) have or do? Have friends or family for a drink or meal at least once a month".

"Would you like to be able to have friends or family for a drink or meal at least once a month, but must do without because you cannot afford it?"

Feeling worthless

"Have you recently... been thinking of yourself as a worthless person?

Playing a useful role

"Have you recently... felt that you Were playing a useful part in things?"

Capability: Play

Feeling happy

"Have you recently.... been feeling reasonably happy, all

Appendix 3.1 Variable names, BHPS questions and relationship to Nussbaum's List of Capabilities

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things considered?"

Able to enjoy activities

"Have you recently... been able to enjoy your normal day-to-day activities?"

Capability: Control Over One's Environment.

Able to vote

"Did you vote in this (past) year's general election?"

Health prevents work

"Does your health keep you from doing some types of work?"

Health limits work

"For work you can do, how much does your health limit the amount of work you can do?"

Appendix 3.2 Variable names and BHPS questions used for satisfaction domains

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Life

"How dissatisfied or satisfied are you with your life overall?"

Health

"How dissatisfied or satisfied are you with your health?"'

Household Income

"How dissatisfied or satisfied are you with the income of your household?"

House

"How dissatisfied or satisfied are you with your house/flat?"

Partner

"How dissatisfied or satisfied are you with your husband/wife/partner?"

Job

"How dissatisfied or satisfied are you with your job?"

Social Life

"How dissatisfied or satisfied are you with your social life?"

Appendix 3.2 Variable names and BHPS questions used for satisfaction domains

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Leisure Amount

"How dissatisfied or satisfied are you with the amount of leisure time you have?"

Leisure Quality

"How dissatisfied or satisfied are you with the way you spend your leisure?

Chapter 4 Obtaining Capability Indicators by Survey[12]

4.1 Introduction

In the previous chapter, secondary data was used to construct indicators of an individual's capabilities. The limited data available in the secondary data source, the BHPS, meant that it was not possible to construct indicators for all capabilities. This finding has been echoed by others who have found that secondary, quantitative data sources provide little evidence about capabilities, *per se*, (Brandolini and D'Alessio (1998) and Kuklys and Robeyns (2005).[13]) In a review of the current literature, Enrica Chiappero-

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[12] An earlier version of this chapter appeared in Anand et.al 2009, *The Journal of Human Development*, March 2009, Vol. 10 No.1. pp. 125-152

[13] In their latter survey presented to an American Economic Association conference, Kuklys and Robeyns (op cit) suggest that only three studies from nearly fifty have concentrated on capabilities. Yet such exercises are vital for operationalisation, Comin (2001).

Martinetti and Jose Manual Roche (2009) identify thirty-two recent empirical studies based on the capability approach of which only four attempt to investigate capabilities as opposed to functionings. They argue that the complex informational requirements of any empirical application of the capability approach requires a plurality of *evaluative spaces, dimensions, units of analysis, and environmental contexts.* They conclude that the lack of information in standard representative surveys on freedom of choice and alternative options among which people can freely choose makes them of limited value when attempting to measure capabilities. This they conclude is the main motivation driving researchers to undertake primary analyses. Such a primary analysis involving the construction of a comprehensive set of capability indicators is addressed in this chapter.

4.2 Methodology

4.2.1 Selection of domains

The first step in collecting primary data is to identify a suitable list of capabilities that will form the basis of the study. In this chapter, the most commonly referred to list, that of Nussbaum (2001) is used. The list comprises ten domains: Life; Bodily Health; Bodily Integrity; Senses,

imagination and thought; Emotions; Affiliation; Other Species; Play; and Control over one's environment. Nussbaum's list of capabilities was first produced in the late eighties but has evolved and been revised as a result of public as well as cross cultural academic discussion. Nevertheless, others have challenged its use.

The use of any list has been the subject of much debate in the literature with Sen refusing to produce or endorse any specific list. His central argument relates to the role he gives to others' agency and thus he emphasises the importance of public reasoning in identifying any suitable list of capabilities Sen (2010 pp. 242-243). He contends that this precludes the inflexible use of some pre-determined fixed list and sees real value in an incomplete theory which is 'consistent and combinable with several different substantive theories' and which may be filled in by reasoned public debate, which is itself a valuable process.

Robeyns (2010) echoes Sen arguing that any list of capabilities needs to be arrived at as a result of participatory public discussion rather than on the basis of foundational theory. In addition, she stresses that the process that generates any list is important and affects its political or academic legitimacy. She (Robeyns, 2003) argues that even if after having

applied Sen's capability approach to a particular question, we end up with exactly the same list as Nussbaum's this does not justify defending one particular list because the theoretical status of the lists will remain distinct, even if both lists contain exactly the same elements. However, she concedes that although Nussbaum may have used philosophical theorising in determining her view of valuable capabilities she has always presented her list as her best current thinking and exposed it to debate through public scrutiny and argument.

Robeyns goes on to produce her own list where the main difference between it and that of Nussbaum is that she includes two additional domains; 'Time-autonomy': being able to exercise autonomy in allocating one's time and 'Domestic work and nonmarket care': being able to raise children and to take care of others. She contends that a list is gender biased if it does not include these two domains. Although Robeyns considers these to be capabilities they would seem to be nearer to choices that individual's can or cannot make. The question to be asked is what would prohibit individuals from exercising either of these choices? Individual's may be subject to societal pressures or cultural influences but no one can prevent them from having twenty-four hours in the day to choose what they do and

how they allocate their time (unless they are imprisoned). Similarly raising children or caring for others is a choice that individual's make although again there may be societal and cultural influences.

Robeyns also compares her list with those of Sabina Alkire and Rufus Black (1997), and the Swedish approach to the quality of life measurement (Robert Erikson and Rune Aberg 1987; Robert Erikson 1992) as well as Nussbaum and concludes that "even though these lists have been drawn up by scholars from different backgrounds and with different aims, they show considerable overlap."(Robeyns 2003, p. 75.)

Alkire (2002b) who is mainly concerned with the capabilities that could be influenced by nongovernmental organisations argues that Nussbaum's list "is constrained by (its) prescriptive character ..., by its orientation to national institutions and policies, and by the uncertain authority of participatory process'. Instead, she proposes using Finnis's practical reason –based identification of 'dimensions of human development. In with Table 2.11, p75 she compares her list with the work of Grisez, Boyle and Finnis, Nussbaum, Max-Neef, Narayan , Schwartz, Ramsey, Doyal and Gough and Mozaffar Qizilbash and shows that there are considerable similarities between each of the lists and concludes that any

more participatory process would yield similar results. She mentions thirty other lists and concludes that 'the inexact and inherently contentious process of synthesizing lists into one favoured set is far less important that using a roughly decent set in the field and modifying it as necessary".

What these reviews show is that as Qizilbash (2002) argues, the differing lists tend to be reconcilable. He argues that it is context and strategic reasons that play the major role in determining the length and content of different lists, rather than fundamental differences in the accounts of well-being or advantage. These arguments appear to be about process rather than content and this being the case this thesis avoids devising yet another list that will be similar to those already existing. Instead, it concentrates on identifying a structure whereby data on the capabilities on a particular list can be identified.

The area of interest is whether capabilities enable people to be satisfied with their life overall. This involves identifying high-level capabilities, those that governments play a part in bringing about, and Nussbaum's list meets these criteria. Sen (1993, p.47) himself agrees that Nussbaum's list 'would not be inconsistent with the capability approach' although 'not by any means required by it..' Her list is formulated at a

highly abstract level and is sensitive to culture and context, it therefore provides a suitable base from which it can be made specific to British culture through the choice of suitable questions.

4.2.2. Choice of dependent variable

Choosing a dependent variable in any empirical investigation of the capability approach poses a problem of identification. The capability approach's emphasis is on what individuals are able to do rather than on what they actually choose to do and it explicitly acknowledges human diversity. It recognises that different individuals will achieve satisfaction with their life through different choices as to what they actually do. Both Sen and Nussbaum have highlighted this tension between the capability approach and any attempt at identification based purely on aggregation. When discussing the need for a multidimensional index of poverty Anand and Sen (1997) for example point out that "any reduction of a multidimensional indicator into a numerical index ... must involve an exercise in weighting". They argue that "any choice of weights should be open to questioning and debating in public discussions." Nussbaum explicitly rules out giving one capability more weight than an other, arguing

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that they are all equally necessary in a society in order for individuals to be able to live a life they have reason to value.

Di Tommaso (2007) avoids the need for an exact measurement of well-being by using a latent variable.. She constructs a Structural Equation Model using the Multiple Indicators and Multiple Causes method to build a latent construct of child well-being by estimating a weight (or factor loading) for each of the functionings she chooses to represent well-being. These weights then represent how much a specific functioning counts in explaining well-being with respect to other functionings.

In other empirical analyses of capabilities, the approach has been to use some measure of subjective well-being, see for example, Burchardt (2005), Anand and van Hees (2006) and Neff (2007). Such a measure avoids the need to identify any predetermined weighting of capabilities. Sen and Nussbaum stress that capabilities are those required in order to be able to live a life we have "reason to value" arguing that we need to scrutinise our motivations for valuing specific lifestyles, and not simply value a certain life without reflecting upon it. Thus, ideally the dependent variable should measure an individual's satisfaction with a life after some reflection on the areas or domains that enable a valuable life to be led. This would go

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some way to avoiding the criticisms that such measures of well-being are subjective and can be affected by the mood of the moment. It would also allow individuals to apply their own weight to each of the capabilities, thus incorporating the concept of agency in to the evaluation of well-being.. To achieve this, the question "How satisfied are you with your life as a whole?" was asked both at the beginning of the questionnaire and at the end. The wording of the question is identical to that in the BHPS and thus facilitates comparisons with other studies that also use life satisfaction. Those giving lower scores at the beginning of the survey tended to give slightly higher scores at the end of the survey whereas those giving higher scores tended to give slightly lower scores

The question at the end of the survey reflects satisfaction with life having given some consideration to the capabilities (or rather Nussbaum's view of these) necessary to lead a life that individual's have reason to value. This final score is more likely to reflect a 'considered' opinion, the opinion that arguably more closely satisfies the concept of reflection consistency, Sen (1985b).[14] The importance of individual capabilities in enhancing an

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[14] There are a number of discussions in mainstream economics journals about the use of SWB as a measure of well-being though Oswald (1997) remains one of the best. Manski

individual's well-being can then be analysed empirically avoiding the issue of aggregation. The results can then inform public debate as to the relevant importance of individual capabilities to an individual's overall well-being..

4.2.3 Developing capability questions

The generation of the capability questionnaire involved four-stages. In the first stage, questions were generated using an iterative process in which possible questions were mapped to Nussbaum's list of capabilities. The questions were then reviewed by a panel from differing academic backgrounds (Ingrid Robeyns, Maria Sigala, Ron Smith,) to check that they were understandable and related to the concepts on the list.

The second stage used a different group of academics (Paul Anand, Ian Carter, Keith Dowding, Francesco Guala, and Martin van Hees) to 'quality control' the iterative process to ensure that the questions devised measured capabilities rather than functionings.

(2004) provides a useful complement in that he focuses on evidence, which indicates the reliability of such data.

In the third stage the questions were reviewed by YouGov to check that their panel would understand them and to ensure that there was a natural order to the sequence of the questions

In the final stage the questionnaire was piloted using a small group of non academics. This provided a final check that the questions were understandable and could be completed in a reasonable amount of time (approximately 20 minutes).

Given the somewhat abstract nature of Nussbaum's list, the issue to be addressed in designing a questionnaire is to construct questions that people can reasonably be expected to answer. In the previous chapter, sets of questions from the BHPS[15], which are closely and sometimes directly, related to items on Nussbaum's list were identified. However although questions in the BHPS indicate that some secondary data concerning

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[15] The value of choosing the BHPS is that it is a secondary data source with similar counterpart surveys in many countries around the world. This means that any questions, which come from it, are likely to be asked regularly and in similar form in other countries, which in turn implies that such questions could, in principle, be used as a basis for international monitoring and comparison.

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capabilities can be found, the coverage of items compared against such lists is substantially incomplete. This incompleteness provides a key motive for developing further indicators and in so doing it is clear that the ten headline domains belie a large and diverse set of capabilities.

Five possible question types were identified:

capabilities as an individual's opportunities

capabilities as an individual's abilities

capabilities as the constraints on an individual

capabilities as functionings with the reason for the choice

capabilities which are universal

For the opportunity type questions, whether individuals had the opportunity to use that capability was identified. For example, part of the explanation that Nussbaum gives for the capability of being in control over one's environment is, "Being able to participate effectively in political choices that govern one's life; having the right of political participation, protection of free speech and association." To identify whether this opportunity existed the question "I am able to participate in the political

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activities that affect my life if I want to" was used to explore whether individuals considered they had this freedom.

The second question type focused on whether the individual had developed the necessary ability to be able to use a capability. The emotions capability is described as "being able to have attachments to things and people outside ourselves". To identify this capability the question "How difficult do you find it to make friendships which last with people outside work?" was asked

At the heart of the capability approach is the concept of trying to remove the constraints, which limit an individual's choice set. This concept was explored with regard to that part of the bodily health capability concerning "adequate shelter". Firstly, the BHPS question "Is your current accommodation adequate or inadequate for your current needs?" was asked. Two further follow up questions identified whether this was as a result of being constrained. The questions "Are you prevented from moving home for any reason?" was followed by asking those who replied that they were whether this was because of; a lack of money or finances, the council being unlikely to re-house them, their family responsibilities and or schooling or for some other reason.

In designing the survey as many of the questions from the BHPS as possible (to allow comparison with the results in Chapter 2) but in so doing it was recognised that some of these question tended to reflect the choices the individuals had made, i.e. their functionings (what they chose to do and be) rather than their capabilities. This was dealt with by asking further questions to probe the reason for the choice. Another part of the bodily health capability concerns "being ... adequately nourished". The BHPS question is "Do you eat fresh meat, chicken or fish at least twice a week?" To indentify whether this was as a result of choice, those answering no were asked whether this was because, they could not afford to, were vegetarian, did not like eating fresh meat chicken or fish that often, did not have time to prepare fresh food or for some other reason.

The final type of question concerned functionings, which also could be considered to be taken as indicator of a capability. The bodily health capability includes "being able to move freely from place to place". The contention is that if an individual feels unsafe within the area of their home then they could not be said to have this capability. This assumes that people living in an unsafe area are doing so because they are constrained in that ideally they would wish to have the capability to be able to live in a safe

area. Two questions were therefore asked; "Please indicate how safe you feel walking alone in the area near your home during the day time?" and "Please indicate how safe you feel walking alone in the area near your home after dark?" Respondents were then asked to give their answers on a seven point scale ranging from completely safe to not at all safe.

There is an issue as to whether these questions give an objective or a subjective view of an individual's capabilities. Gasper (2007) for example argues that the capability approach is an intermediary between objective well-being and subjective well-being but because it associates feelings to actual functionings. Sen argues that 'if social conditioning makes a person lack the courage to choose (perhaps even to 'desire' what is denied but what would be valued *if* chosen), then it would be unfair to undertake the ethical assessment *assuming* that she does have that effective choice. It is a matter of concentrating on the real freedoms actually enjoyed, taking note of *all* the barriers—including those from 'social discipline' (Sen 1992, p. 149, original emphases). Asking individuals to evaluate their own capabilities ensures that the capabilities they enjoy are identified and thus provides an objective assessment of their view of their capabilities.

Table 4.1 details, the capabilities, questions and variables constructed from this approach. The second column of Table 4.1 indicates how responses were coded for analysis.[16]

4.2.4 Person specific effects

Sen (1985a) emphasizes the importance of allowing for individual differences when considering capabilities and Ferrer-i-Carbonell and Frijters (2004) suggest that there is a need for more information on the aspects of persons that influence life satisfaction. One method of allowing for this source of heterogeneity would be to use person-specific effects from panel data as Clark et al (2005) suggest. This was not possible within the budgetary constraints of the thesis so measures of personality were added to the questionnaire to overcome the limitations of using cross sectional data. The instrument used is a short form developed for incorporation into research where personality is not the sole focus. Devised by Gosling and Rentfrow (2003) it consists of five pairs of questions that are responded to

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[16] The questions were devised through the process described Section 4.2 this included workshops held at Wolfson College, Oxford in September 2004 and piloting with potential respondents.

on a one to seven scale with agreement semantic anchors. The score is summed in each pair, thus giving five dimension scores in the range 2-14. The questions and variable names are given in Appendix 4.1

4.2.5 Survey methods

The questions discussed thus far (over 60 indicators of Q (an individual's capability set), the measure of experienced utility (satisfaction with life), and the questions relating to personality) together with a small number of socio-demographics comprised the survey instrument that takes approximately 20 minutes to complete.

In order to obtain a large representative sample of over 1,000 respondents an external internet polling company You Gov was selected. This gave access to their pool of around 50,000 electors throughout Great Britain. Those registering as members of the pool complete a detailed questionnaire allowing a representative sample of electors to be selected each time a survey is conducted. The procedure used by YouGov is to keep inviting respondents who will comprise a representative sample to answer the questionnaire until they have sufficiently large sample. The respondents took part in a self-complete survey in February 2005, which was notified by

email and completed through the company's web pages. 1000 responses were commissioned (with 1048 being supplied) though the number of observations used in each analysis varies due to missing observations. Respondents received a small incentive of £1 for completing the survey. The surveying approach taken is one increasingly adopted following recent legislation in the UK that limits access to the electoral registers and results in a quota sample design that is common, if not standard, in social and economic surveys such as this one (e.g. BHPS).

Because of the overlap in questions with the BHPS it was possible to conduct *ex post* checks on our sample and these are presented, in appendix 2. The subjective well-being variable was measured on a standard, 7-point Likert scale. None of the substantive variables checked are significantly different when the survey is compared with the BHPS and though two socio-demographic variables examined are statistically different at a 5% level, it is not obvious that the differences in average age or sex ratios are that material. Indeed the samples are relatively large and so even small differences in socio-economic variables can be expected to be statistically significant.

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Life.		
Being able to live to the end of a human life of normal length; not dying prematurely, or before one's life is so reduced as to be not worth living.	Given your family history, dietary habits, lifestyle and health status until what age do you expect to live?	**Life Expectancy**
Bodily Health.		
Being able to have good health,	Does your health in any way limit your daily activities compared to most people of your age? Yes=0, No=1.	**Health limits activities**
including reproductive health;	Are you able to have children? Yes=0, No=1, No because of my age =0, No I have had a	**Reproductive health**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Bodily Health (contd.)	vasectomy / hysterectomy =0	
to be adequately nourished;	Do you eat fresh meat, chicken or fish at least twice a Week?	**Adequately nourished**
	Yes=1, No, I cannot afford to =0, No I am vegetarian, vegan=1, No I do not like eating fresh meat chicken or fish that often =1, No I do not have time to prepare fresh food=1, No some other reason = 1	.
to have adequate shelter.	Is your current accommodation adequate or inadequate for your current needs?	**Adequate shelter**
	More than adequate=1, Adequate=1, Inadequate=0, Very inadequate=0	

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Bodily Health (contd.)	Are you prevented from moving home for any reason? Yes lack of money/finances prevents me=0, Yes the council would be unlikely to re-house me=1, Yes family responsibilities and/ or schooling = 1, Yes for some other reason=1, No=1	
Bodily Integrity.		
Being able to move freely from place to place;	Please indicate how safe you feel walking alone in the area near your home DURING THE DAY time Completely safe =7, Very safe=6, Fairly safe=5, Neither safe nor unsafe=4, Fairly unsafe=3, Very unsafe=2, Not	**Safe during day**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Bodily Integrity (contd.).		
	at all safe=1	
	Please indicate how safe you feel walking alone in the area near your home AFTER DARK	**Safe during night**
	Completely safe =7, Very safe=6, Fairly safe=5, Neither safe nor unsafe=4, Fairly unsafe=3, Very unsafe=2, Not at all safe=1	
to be secure against violent assault,	Have you ever been the victim of some other form of violent assault or attack – i.e. an assault other than sexual or domestic? Yes=1, No=0, Prefer not to answer	**Previous violent assault**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Bodily Integrity (contd.).		
	How likely do you think it is that you will be a victim of violent assault or attack in the future?	**Future violent assault**
	Extremely likely=7, Very likely=6, Fairly likely=5, Neither likely nor unlikely=4, Fairly unlikely=3, Very unlikely=2, Extremely unlikely=1	.
including sexual assault	Have you ever been a victim of sexual assault?	**Past sexual assault**
	Yes = 1, No=0, Prefer not to answer	
	Please indicate how vulnerable you feel to sexual assault or attack – using a scale of 1 to 7	**Future sexual assault**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Bodily Integrity (contd.)		
	where 1 means "not at all vulnerable" and 7 means "very vulnerable"	
and domestic violence;	Have you ever been a victim of domestic violence? Yes=1, No=0, Prefer not to answer.	**Past domestic assault**
	Please indicate how vulnerable you feel to domestic violence in the future – using a scale of 1 to 7 where 1 means "not at all vulnerable" and 7 means "very vulnerable"	**Future domestic assault**
having opportunities for sexual satisfaction	Do you have sufficient opportunities to satisfy	**Sexual satisfaction**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Bodily Integrity (contd.)		
	your sexual needs and desires?	
	Yes=1, No=0, Prefer not to answer	
and for choice in matters of reproduction.	Even if you don't need or have never needed any of the following, are you prohibited from using any of the following for any reason (e.g. religious beliefs, family pressure)?	**Reproduction choice**
	Contraception=1, Abortion=1, Infertility treatment=1, I am not prohibited from using any of the above=0	

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Senses, Imagination, and Thought.		
Being able to use the senses, to imagine, think, and reason - and to do these things in a 'truly human' way, a way informed and cultivated by an adequate education, including, but by no means limited to, literacy and basic mathematical and scientific training. Being able to use imagination and thought in connection	Educated to A level and above = 1 Others =0.	**Education**
	How often do you use your imagination and or reasoning in your day to day life?	**Uses imagination**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Senses, Imagination, and Thought (contd.)		
with experiencing and producing works and events of one's own choice, religious,	All the time=7, Very often=6, Fairly often=5, Occasionally=4, Rarely=3, Very Rarely=2, Never=1	
literary, musical, and so forth. Being able to use one's mind in ways protected by guarantees of freedom of expression with respect to both political and artistic	I am free to express my political views Agree strongly=7, Agree moderately=6, Agree a little=5, Neither agree nor disagree=4, Disagree a little=3, Disagree moderately=2, Disagree strongly =1	**Political expression**
speech, and freedom of religious exercise.	I am free to practice my religion as I want to Agree strongly=7, Agree moderately=6, Agree a little=5, Neither agree nor disagree=4,	**Exercise religion**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Senses, Imagination, and Thought (contd.)		
Being able to have pleasurable experiences and to avoid non-beneficial pain	Disagree a little=3, Disagree moderately=2, Disagree strongly =1 Have you recently been able to enjoy your normal day-to- day activities? More so than usual=4, Same as usual=3, Less so than usual=2, Much less than usual=1	**Enjoy Activities**
Emotions.		
Being able to have attachments to things and people outside ourselves; to love those who love and care for us,	How difficult do you find it to make friendships which last with people outside work? Extremely difficult=1, Very difficult=2, Fairly difficult=3, Neither difficult nor easy=4, Fairly easy=5, Very easy=6,	**Makes friends**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Emotions (contd.)	Extremely easy=7	
	At present how easy or difficult do you find it to enjoy the love care and support of your immediate family?	**Family love**
	Extremely difficult=1, Very difficult=2, Fairly difficult=3, Neither difficult nor easy=4, Fairly easy=5, Very easy=6, Extremely easy=7	
to grieve at their absence; in general, to love, to grieve, to experience longing, gratitude, and justified anger.	Do you find it easy or difficult to express feelings of love, grief, longing, gratitude, and anger compared to most people of your age?	**Express feelings**
	Extremely difficult=1, Very	

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Emotions (contd.)	difficult=2, Fairly difficult=3, Neither difficult nor easy=4, Fairly easy=5, Very easy=6, Extremely easy=7	
Not having one's emotional development blighted by fear and anxiety. (Supporting this capability means supporting forms of human association that can be shown to be crucial in their development.)	Have you recently lost much sleep over worry? Not at all=1, No more than usual=2, Rather more than usual=3, Much more than usual=4	**Lost sleep**
	Have you recently felt constantly under strain? Not at all=1, No more than usual=2, Rather more than usual=3, Much more than usual=4	**Under strain**
Practical Reason.		
Being able to form a conception of the good	My idea of a good life is based on my own	**Concept of good life**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Practical Reason (contd.)		
and to engage in critical reflection about the planning of one's life. (This entails protection for the liberty of conscience and religious observance.)	judgement Agree strongly=7, Agree moderately=6, Agree a little=5, Neither agree nor disagree=4, Disagree; a little=3, moderately=2, strongly=1	**Plans life**
	Please indicate how strongly you agree or disagree with the following statement; 'I have a clear plan of how I would like my life to be' Agree strongly=7, Agree moderately=6, Agree a little=5, Neither agree nor disagree=4, Disagree a little=3, Disagree moderately=2, Disagree	**Evaluates life**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Practical Reason (contd.)		
	strongly=1	
	How often, if at all, do you evaluate how you lead your life and where you are going in life? All the time=7, Very often=6, Fairly often=5, Occasionally=4, Rarely=3, Very rarely=2, Never=1	
	Outside of work, have you recently felt that you Were playing a useful part in things? More so than usual=4, Same as usual=3, Less so than usual=2, Much less than usual=1	**Useful Role**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Affiliation.		
Being able to live with and toward others, to recognize and' show concern for other human beings,	I respect, value and appreciate other people Agree strongly=7, Agree moderately=6, Agree a little=5, Neither agree nor disagree=4, Disagree a little=3, Disagree moderately=2, Disagree strongly=1	**Respects others**
to engage in various forms of social interaction;	Do you normally have at least a Week's (seven days) annual holiday away from home? Yes=1, No because of lack of money/finances=0, No because of lack of time,=1 No because I did not want to=1, Some other reason =1	**Takes holidays**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Affiliation (contd.)		
	Do you normally meet up with friends or family for a drink or a meal at least once a month? Yes=1, No because of lack of money/finances=0, No because I do not have the time=1, No because I choose not to=1, No for some other reason=1	**Meets friends**
to be able to imagine the situation of another	Do you tend to find it easy or difficult to imagine the situation of other people? (i.e. 'to put yourself in others' shoes') Extremely easy=7, Very easy=6, Fairly easy=5, Neither easy nor difficult=4, Fairly difficult=3, Very difficult=2,	**Thinks of others**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Affiliation (contd.)	Extremely difficult =1	
Having the social bases of self-respect and non-humiliation;	Have you recently been thinking of yourself as a worthless person?	**Self Worth**
being able to be treated as a dignified being whose worth is equal to that of others	Not at all=4, No more than usual=3, Rather more than usual=2, Much more than usual=1	
This entails provisions of non-discrimination on the basis of race, sex, sexual orientation, ethnicity, caste, religion, and national origin.	Outside of any employment or work situation, have you ever experienced discrimination because of your; race, sexual orientation, gender, religion, age?	**Past discrimination; racial, sexual, religious, age, sexual orientation**
	Yes=1, No=0.	

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Affiliation (contd.)	Outside of any work or employment situation how likely do you think it is that in the future you will be discriminated against because of your; race, sexual orientation, gender, religion, age?	**Future discrimination; racial, sexual, religious, age, sexual orientation**
	#Extremely likely=1, Very likely=2, Fairly likely=3, Neither likely nor unlikely=4, Fairly unlikely=5, Very unlikely=6, Extremely unlikely=7	
Other Species		
Being able to live with concern for and in relation to animals,	Please indicate to what extent you agree or disagree with the	**Concern for other species**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Other Species (contd.)		
plants, and the world of nature.	following statement: I appreciate and value plants, animals and the world of nature? Agree Strongly=7, Agree moderately=6, Agree a little=5, Neither agree nor disagree=4, Disagree a little=3, Disagree moderately=2, Disagree strongly=1	.
Play		
Being able to laugh, to play, to enjoy recreational activities	Have you recently been enjoying your recreational activities? More so than usual=4, Same as usual=3, Less so than usual=2, Much less than usual=1.	**Enjoys recreation**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Control Over One's Environment		
Political. Being able to participate effectively in political choices that govern one's life; having the right of political participation, protection of free speech and association	I am able to participate in the political activities that affect my life if I want to. Agree strongly=7, Agree moderately=6, Agree a little=5, Neither agree nor disagree=4, Disagree a little=3, Disagree moderately=2, Disagree strongly=1	**Participate in politics**
Material Being able to hold property (both land and movable goods), and having property rights on an equal basis with others;	For which of the following reasons, if any, have you not bought your home? I cannot afford to buy=0, I cannot obtain a mortgage=0, I think it is a bad time to buy=1, Some other reason=1	**Owns home**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Control Over One's Environment (contd.)		
having the right to seek employment on an equal basis with others	When seeking employment in the past, have you ever experienced discrimination because of your; race, sexual orientation, gender, religion, age Yes=1, No=0	**Past discrimination (work), racial, sexual, religious, age, sexual orientation**
	Do you intend seeking work in the future? Yes = 1, No=0.	**Expect to work**
	When seeking work in the future how likely do you think it is that you will experience discrimination because of your; race,	**Future discrimination (work), racial, sexual, religious, age, sexual**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Control Over One's Environment (contd.)		
having the freedom from unwarranted search and seizure.	sexual orientation, gender, religion, age? Extremely likely=7, Very likely=6, Fairly likely=5, Neither likely nor unlikely=4, Fairly unlikely=3, Very unlikely=2, Extremely unlikely=1	**orientation**
	How likely do you think it is that within the next 12 months you will be stopped and searched by the police when it is not warranted?	**Expect stop and search**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Control Over One's Environment (contd.)		
	Extremely likely=7, Very likely=6, Fairly likely=5, Neither likely nor unlikely=4, Fairly unlikely=3, Very unlikely=2, Extremely unlikely=1	
In work, being able to work as a human being, exercising practical reason	To what extent does your work make use of your skills and talents? All the time=7, Almost all the time=6, Most of the time=5, Some of the time=4, Rarely=3, Very rarely=2, Never=1	**Skills used at work**
	At work, have you recently felt that you Were playing a useful part in	**Useful role at work**

Table 4.1: Capabilities, Survey Questions and Variables

Nussbaum's Capability	Survey Questions	Variable
Control Over One's Environment (contd.)		
	things?	
	More so than usual=4, Same as usual=3, Less so than usual=2, Much less than usual=1	
and entering into meaningful relationships of mutual recognition with other workers.	Do you tend to find it easy or difficult to relate to your colleagues at work?	**Relate to colleagues**
	Extremely easy=7, Very easy=6, Fairly easy=5, Neither easy nor difficult=4, Fairly difficult=3, Very difficult=2, Extremely difficult=1	.
	At work are you treated with respect?	
	All the time,=7 Almost all the time=6, Most of the time=5, Some of the time=4, Rarely=3, Very Rarely=2, Never=1	**Respected by colleagues**

4.3 Results

The dataset generated by the survey instrument is rich and there are a number of possible pathways through it. The emphasis here is on understanding which capabilities can be taken to be covariates of life satisfaction which is obtained by first analysing a basic regression model before moving on to report the results of additional analyses that address robustness and sub-population variations. Throughout the analysis, the dependent variable is a measure of life satisfaction (SWB) which is distributed as indicated in Figure 1.
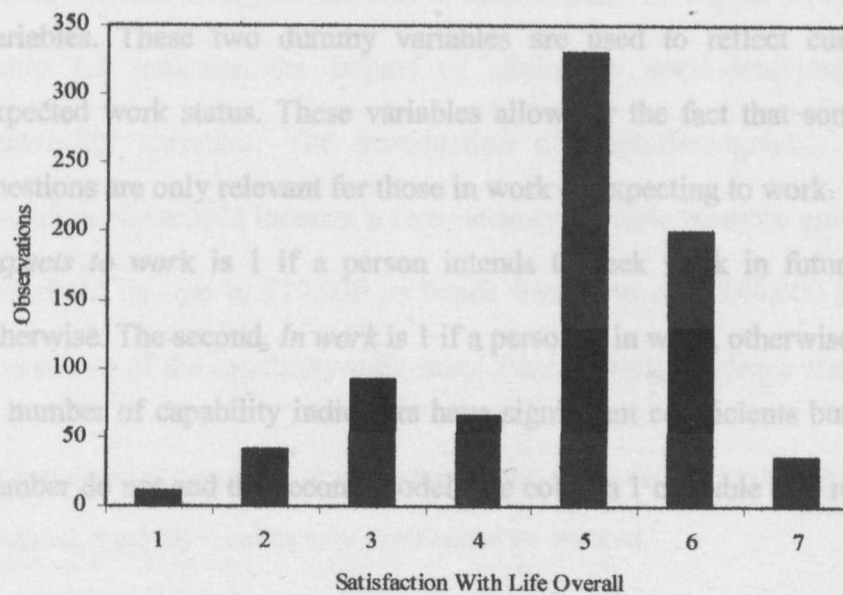
Figure 1: Distribution of Subjective Well-being

As described in section 2.1, individuals obtain utility (v_i) from their bundle of functionings via their valuation function

$$v_i = v_i(\mathbf{b}_i)$$

where $\mathbf{b}_i$ is the individual's bundle of functionings. Since this bundle of functionings is a function of an individual's capabilities, their subjective well being or utility (swb_i) can be modelled as a function of their capabilities (q_i)

$$swb_i = f_i(q_i)$$

This first OLS model presented in Table 4.2, estimates subjective well being as a function of the 60 plus capability indicators plus two dummy variables. These two dummy variables are used to reflect current and expected work status. These variables allow for the fact that some of the questions are only relevant for those in work or expecting to work. The first, *Expects to work* is 1 if a person intends to seek work in future, and 0 otherwise. The second, *In work* is 1 if a person is in work, otherwise it is 0. A number of capability indicators have significant coefficients but a larger number do not and the second model (see column 1 of Table 4.3) represents

the results of a backward elimination exercise.[17] This second model provides a benchmark for subsequent analyses and shows that 17 capability indicators, drawn from a wide range of life domains, had coefficients that were significant at the 5% level. This finding is consistent both with the economics literature on poverty, which now accepts that welfare is inherently multi-dimensional, as well as with the psychological literature on happiness which indicates that many domains are important for life satisfaction.[18]

The issue of robustness is pursued by taking this second model and asking whether different variables or models make an impact on the results. Table 4.3 indicates the impact of adding in socio-demographic and personality variables. The introduction of socio-demographic controls, including Household Income, a five category variable measure gross annual household income in £10,000 pa bands from 0 to over £40,000 and over, causes two of the capability indicators; *Past domestic violence* and *Expects*

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[17] Least significant variables were eliminated sequentially and the model re-run until all remaining capability variables were significant at the 5% level.

[18] It has to be said that the psychological literature has tended in the past to concentrate on bivariate analyses – so multivariate analyses make a valuable addition to that literature.

stop and search to become insignificant, though only one of these controls, *Household income*, is itself significant.

The motivation for exploring the impact of personality has already been described and it is interesting to note that two dimensions, *Extravert* and *Emotionally stable* are significantly related to life satisfaction, whilst the others are not – even at the 10% level. That said, only the *Evaluates life* capability indicator ceases to be significant as the personality variables are introduced. These findings confirm the view that life satisfaction is related to personality, which underlines the value of using panel data with person specific effects where such data are available or the inclusion of at least some personality measures in cross-sectional surveys where this is possible. On the other hand, where measures of personality are not available, these findings suggest that conclusions about significance of variables may be reasonably robust.

The last model in Table 4.3, in which demographics and personality are combined, appears to confirm that the personality and demographic variables do not substantially alter the conclusions one might draw about the relations between capabilities and life satisfaction.

Table 4.2: Subjective Well-being and Capability Indicators

	Coefficient	std. error
Constant	-0.43	0.80
Life		
Life Expectancy	0.00	0.00
Bodily Health		
Health limits activities	0.13	0.10
Reproductive health	-0.03	0.19
Adequately nourished	0.33	0.27
Adequate shelter	0.23	0.13
Able to move home	0.12	0.10
Bodily Integrity		
Safe during day	0.01	0.05
Safe during night	-0.01	0.04
Previous violent assault	-0.05	0.10
Future violent assault	-0.02	0.03
Past sexual assault	-0.04	0.13
Future sexual assault	-0.04	0.03
Past domestic violence	-0.19	0.11
Future domestic violence	0.03	0.04
Sexual satisfaction	**0.30**	0.09
Reproduction choice	-0.12	0.15
Senses, Imagination and Thought		
Education	0.04	0.08
Uses imagination	**0.08**	0.04
Political expression	-0.01	0.05
Exercise religion	-0.05	0.04
Enjoys activities	0.07	0.08
Emotions		
Makes friends	0.01	0.03
Family Love	**0.08**	0.03
Expresses feelings	**0.13**	0.03
Lost Sleep	-0.03	0.06
Under Strain	-0.07	0.07

Table 4.2: Subjective Well-being and Capability Indicators

	Coefficient	std. error
Practical Reason		
Concept of good life	0.05	0.04
Plan of life	**0.16**	0.03
Evaluates Life	-0.12	0.04
Useful role	**0.37**	0.07
Affiliation		
Respects others	**0.10**	0.05
Takes holidays	0.20	0.11
Meets friends	0.14	0.09
Thinks of others	0.02	0.04
Self Worth	**0.34**	0.06
Discrimination		
– past racial	-0.08	0.18
- future racial	0.00	0.05
- past sexual	0.25	0.16
- future sexual	-0.05	0.04
- past sexual orientation	-0.26	0.27
- future sexual orientation	0.07	0.06
- past religious	0.12	0.22
- future religious	0.02	0.06
- past age	0.15	0.13
- future age	-0.01	0.03
Concern for other species		
appreciates plants, animals nature	-0.06	0.04
Play		
Enjoy recreation	-0.02	0.06
Control over one's environment		
Participate in politics	0.04	0.04
Owns home	0.12	0.12
Discrimination at work		
- past racial	**-0.65**	0.22
- future racial	0.10	0.06

Table 4.2: Subjective Well-being and Capability Indicators

	Coefficient	std. error
Control over one's environment (contd.)		
- past sexual	0.14	0.14
- future sexual	0.00	0.05
- past sexual orientation	-0.16	0.30
- future sexual orientation	-0.01	0.08
- past age	-0.04	0.10
- future age	-0.01	0.03
- expects stop and search	-0.05	0.03
At work		
- skills used	0.04	0.04
- useful role	-0.01	0.06
- relate to colleagues	0.00	0.05
- respected by colleagues	0.03	0.06
Demographics		
In work	**-0.38**	0.32
Expect to work	-0.13	0.18
R^2	0.61	
Adjusted R^2	0.56	
Log likelihood	-673.90	
Observations	559	

Note: Significant at 5% in bold

Table 4.3: Subjective Well-being, Capabilities, Demographics and Personality

	Capabilities	Capabilities Demographics	Capabilities Personality	Capabilities Demographics Personality
Bodily Health				
Adequate shelter	0.27	0.29	0.22	0.23
	(0.09)	(0.10)	(0.09)	(0.09)
Bodily Integrity				
Past domestic violence	-0.17	-0.13	-0.17	-0.14
	(0.08)	(0.09)	(0.08)	(0.09)
Sexual satisfaction	0.25	0.21	0.25	0.22
	(0.07)	(0.08)	(0.07)	(0.07)
Emotions				
Family love	0.08	0.08	0.08	0.08
	(0.03)	(0.03)	(0.03)	(0.03)
Expresses feelings	0.11	0.11	0.10	0.10
	(0.03)	(0.03)	(0.03)	(0.03)
Under strain	-0.13	-0.10	-0.11	-0.08
	(0.04)	(0.04)	(0.04)	(0.04)
Practical Reason				
Concept of good life	0.09	0.10	0.08	0.09
	(0.03)	(0.03)	(0.03)	(0.03)
Plan of life	0.12	0.13	0.10	0.11
	(0.02)	(0.02)	(0.02)	(0.02)
Evaluates life	-0.06	-0.06	-0.03	-0.03
	(0.03)	(0.03)	(0.03)	(0.03)
Useful Role	0.36	0.38	0.35	0.37
	(0.05)	(0.05)	(0.05)	(0.05)
Affiliation				
Respects others	0.09	0.12	0.11	0.13
	(0.03)	(0.04)	(0.04)	(0.04)
Takes holidays	0.27	0.21	0.25	0.20
	(0.08)	(0.09)	(0.08)	(0.08)

Table 4.3: Subjective Well-being, Capabilities, Demographics and Personality

	Capabilities	Capabilities Demographics	Capabilities Personality	Capabilities Demographics Personality
Self Worth	0.35	0.37	0.29	0.31
	(0.04)	(0.05)	(0.05)	(0.05)
Control over one's environment				
Past racial discrimination (work)	-0.54	-0.55	-0.58	-0.59
	(0.17)	(0.17)	(0.17)	(0.17)
Future racial discrimination (work)	0.08	0.07	0.07	0.07
	(0.03)	(0.03)	(0.03)	(0.03)
Expects stop and search	-0.05	-0.04	-0.06	-0.04
	(0.02)	(0.02)	(0.02)	(0.02)
Skills used at work	0.08	0.07	0.07	0.07
	(0.03)	(0.03)	(0.03)	(0.03)
Demographics				
In Work	-0.32	-0.36	-0.35	-0.37
	(0.16)	(0.17)	(0.16)	(0.16)
Expects to work	-0.23	-0.25	-0.24	-0.28
	(0.09)	(0.10)	(0.09)	(0.10)
Gender		-0.04		-0.08
		(0.07)		(0.07)
Age		-0.02		-0.02
		(0.01)		(0.01)
Age^2		0.00		0.00
		(0.00)		(0.00)
Household Income		0.07		0.06
		(0.03)		(0.03)
South of England		-0.20		-0.18
		(0.10)		(0.10)
Midlands and Wales		0.00		(0.04
		(0.10)		(0.10)
North of England		-0.17		-0.14
		(0.10)		(0.10)

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Table 4.3: Subjective Well-being, Capabilities, Demographics and Personality

	Capabilities	Capabilities Demographics	Capabilities Personality	Capabilities Demographics Personality
Scotland		-0.04		0.00
		(0.13)		(0.13)
Personality				
Extravert			**0.08**	**0.07**
			(0.03)	(0.03)
Agreeable			-0.04	-0.04
			(0.03)	(0.03)
Conscientious			-0.04	-0.03
			(0.03)	(0.03)
Emotionally Stable			**0.11**	**0.12**
			(0.03)	(0.03)
Open to experiences			-0.04	-0.03
			(0.03)	(0.03)
R^2	0.54	0.55	0.56	0.57
Adjusted R^2	0.53	0.54	0.55	0.55
Log likelihood	-999.89	-990.71	-983.08	-974.19
Observations	778	778	778	778

Note: Standard errors in parenthesis; significant at 5% in bold

The OLS results lead to coefficients that apply throughout the parameter space and are therefore easier to interpret than they are for other models but

it is nonetheless important to ask whether other model forms are appropriate.[19]

To this point, the analysis indicates a degree of robustness in the relationship between life satisfaction and capability covariates. However, an important element of the capabilities approach is, that it is recognises the fact that people convert goods and their characteristics into functionings and happiness at different rates – a point that has implications for economic justice. Personality variables are significant but apart from income, no other control variables are. Whilst the coefficients on *Age* and *Sex* are not significant, some differences both *a priori* as well from the literature are to

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[19]Ordered logit and ordered probit models were also estimated, the results, as one might expect, give slightly better fits than OLS but tell a virtually identical story when it comes to identifying statistically non-zero coefficients. It is perhaps also worth commenting on the practice of treating ordinal scales numerically. The justification is merely pragmatic and avoids regression results with hundreds of coefficients, which are both difficult to read and interpret and make heavy demands on degrees of information. This amounts to imposing a linearity assumption on the functional form of the partial relations which is innocent for truly linear relations but is likely to result in conservative estimates of relationship strength for non-linear relations.

be expected so finally two analyses of the model in Table 4.2 estimated for two sets of population sub-samples are presented in Table 4.4. This table shows results for a breakdown of respondents by gender, whilst Table 4.5 summarises a similar analysis for respondents below and above 45 years of age – the approximate mean age for the overall sample.

At this point, a more heterogeneous picture begins to emerge. Of course some differences are to be expected as the partial de-pooling of the data reduces the sample size for each regression but the differences are generally consistent with prior expectations about within population variations. The fact that *Adequate shelter* has a significant coefficient for women but not for men could reflect either gender based differences in attitudes to domestic accommodation or different amounts of time spent in the home. However, the regression does already control for work status, which could be taken as a possible proxy for time in the home so perhaps the sexes do weigh accommodation quality differently. Differences between the sexes in terms of opportunities to seek *Sexual satisfaction* and the ability to enjoy *Family love* are unsurprising. The fact that the ability to *Express*

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Table 4.4: Model Estimates for Sub samples by Gender

	OLS Females	Ordered Logit p value*	OLS Males	Ordered Logit p value*
Bodily Health				
Adequate shelter	**0.39**		0.02	
	(0.13)	0.01	(0.15)	0.96
Bodily Integrity				
Past domestic violence	-0.18		-0.18	
	(0.10)	0.19	(0.17)	0.36
Sexual satisfaction	0.14		**0.29**	
	(0.11)	0.09	(0.11)	0.00
Emotions				
Family love	**0.12**		0.02	
	(0.03)	0.00	(0.04)	0.20
Expresses feelings	0.04		**0.16**	
	(0.04)	0.38	(0.04)	0.00
Under Strain	-0.04		**-0.16**	
	(0.05)	0.07	(0.06)	0.01
Practical Reason				
Concept of good	**0.16**		0.05	
	(0.04)	0.00	(0.04)	0.44
Plans life	**0.11**		**0.09**	
	(0.04)	0.00	(0.04)	0.03
Evaluates life	-0.03		-0.02	
	(0.04)	0.48	(0.04)	0.70
Useful Role	**0.41**		**0.30**	
	(0.07)	0.00	(0.08)	0.00
Affiliation				
Respects others	**0.13**		0.08	
	(0.05)	0.03	(0.06)	0.30
Takes holidays	0.12		**0.27**	
	(0.11)	0.37	(0.14)	0.02

Table 4.4: Model Estimates for Sub samples by Gender

	OLS Females	Ordered Logit p value*	OLS Males	Ordered Logit p value*
Affiliation (contd.)				
Self Worth	**0.32**		**0.28**	
	(0.06)	0.00	(0.07)	0.01
Past racial discrimination	-0.23		**-0.73**	
	(0.26)	0.54	(0.23)	0
Future racial discrimination	0.04		0.07	
	(0.05)	0.34	(0.05)	0.04
Control over one's environment				
Expect stop and search	-0.03		-0.05	
	(0.04)	0.11	(0.03)	0.02
Skills used at work	0.02		**0.11**	
	(0.04)	0.37	(0.04)	0.00
Demographics				
In work	-0.03		**-0.75**	
	(0.23)	0.57	(0.25)	0.00
Expect to work	**-0.40**		-0.11	
	(0.14)	0.00	(0.15)	0.23
Age	-0.03		0.01	
	(0.02)	0.06	(0.02)	0.55
Age^2	0.00		0.00	
	(0.00)	0.16	(0.00)	0.41
Household income	0.03		**0.10**	
	(0.04)	0.36	(0.04)	0.04
South of England	-0.16		-0.17	
	(0.14)	0.20	(0.15)	0.17
Midlands and Wales	0.14		-0.11	
	(0.14)	0.34	(0.15)	0.30
North of England	-0.13		-0.12	
	(0.13)	0.45	(0.14)	0.23

Table 4.4: Model Estimates for Sub samples by Gender

		OLS	Ordered Logit p value*	OLS	Ordered Logit p value*
		Females		Males	
	Scotland	0.13		-0.12	
		(0.18)	0.74	(0.18)	0.47
Personality					
	Extravert	**0.08**		0.03	
		(0.03)	0.02	(0.04)	0.53
	Agreeable	-0.06		0.00	
		(0.04)	0.24	(0.05)	0.80
	Conscientious	-0.07		0.00	
		(0.04)	0.03	(0.04)	0.80
	Emotionally stable	**0.13**		**0.14**	
		(0.04)	0.00	(0.04)	0.00
	Open to experiences	-0.01		-0.05	
		(0.04)	0.90	(0.05)	0.30
R^2		0.61		0.58	
Adjusted R^2		0.58		0.54	
Log likelihood		-505.90		-445.00	
Observations		418		360	

Note: OLS Standard errors in parenthesis; significant at 5% in bold
*The p values are those associated with the coefficients from an ordered logit model estimated on the same set of variables as used for the OLS model

feelings and that being *Under strain* are similarly related to life satisfaction but only significant for men suggests that similar processes might be present in both men and women but that the main consequence of gender differences has to do with the impact of the process. There are a few

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similarities also: *Plans life*, having a *Useful role* and *Self Worth* are significant for both men and women but they are the only variables of which this is true. Together they might be taken as relating to agency, Nussbaum and Sen (1993), autonomy, Raz (1986) or going further back to psychological work on achievement-motivation, McClennen (1988), and they suggest the shared importance to men and women of life structure. So perhaps this string of concepts related to autonomy is a candidate for being a universal, master value.[20]

Discrimination is important from a capabilities perspective (as it constrains autonomy and redistributes freedom) after controlling for income, there appears to be an impact on life satisfaction. Specifically, *Past racial discrimination* at work, is negatively related to life satisfaction for men as is perhaps to be expected. In addition, it has the correct (negative) sign for women but this is not significant – a fact that could simply reflect less time in paid work settings. The finding appears to be strong as it occurs in regressions that control for income, personality and a substantial number of

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[20] This is also consistent both with the finding that the quality of a job has a positive impact on life satisfaction and with those of Winkelmann and Winkelmann (1998) who also control for income and find that the non-pecuniary costs of unemployment are high.

other (mainly capability) variables. But the results are also striking by virtue of what they do not say. The fact that other forms of discrimination are not statistically significant may be due to the paucity of cell observations (e.g. discrimination on grounds of sexual orientation) but could also reflect the nature of such discrimination or the extent to which people adapt to it. A more significant difficulty, however, arises with the related variable indicating that *Future racial discrimination* at work is expected which has a significant coefficient, but in the wrong direction for the pooled data, and is also positively related to life satisfaction (though not significant either for men or women). It may be that the salient comparison is with the person's own past, or the position of their parents or friends and relatives in a different country and that by those lights, most outcomes seem preferable.

In Table 4.5, the final analysis concerning age differences suggests a reduction in the number of significant capabilities over time as well as a somewhat changed pattern. *Family love*, *Plans life* and *Useful role* are the only variables significant for both age groups, a finding not dissimilar to that for sex differences suggesting that agency, in some form, provides a common core of life satisfaction for men and women across the age spectrum. The fact *that Adequate shelter* is significant only for those under

45 might indicate that accommodation improves as people accumulate assets over the life course, though combined with the previously noted fact that the variable is only significant for females suggests that concern about adequacy could be heightened by the needs of bringing up young children. The importance of the opportunity to use skills at work and the cost of being in work change with age but it is impossible to distinguish whether this reflects cohort variations or the effect of ageing. It is certainly plausible that the rising negative impact on life satisfaction of being in work is related to ageing but it is less obvious why opportunities to use skills and talents in work have a greater impact on life satisfaction. A particularly striking difference seems to arise from the fact that the number of capability indicators that have significant coefficients drops by nearly half as we move from the younger to the older age group. It is well known that life-satisfaction exhibits a u-shaped relationship with respect to age (though not why the relation exists) but it has not previously been shown that certain capability covariates decline in importance with age or that there are multiple causes. One possible component of an explanation is that over the life course, people's aspirations do adapt in a number of areas. However,

Table 4.5: Model Estimation for Sub-samples by Age Group

	OLS	Ordered Logit p value*	OLS	Ordered Logit p value*
	Under 45		Over 45	
Bodily Health				
Adequate shelter	**0.22**		0.35	
	(0.11)	0.02	(0.20)	0.16
Bodily Integrity				
Past domestic violence	-0.02		-0.25	
	(0.12)	0.83	(0.12)	0.04
Sexual satisfaction	**0.29**		0.09	
	(0.10)	0.01	(0.11)	0.17
Emotions				
Family love	**0.10**		**0.10**	
	(0.04)	0.00	(0.04)	0.00
Expresses feelings	0.07		**0.13**	
	(0.04)	0.13	(0.04)	0.00
Under strain	-0.05		-0.13	
	(0.06)	0.16	(0.07)	0.03
Practical Reason				
Concept of life	**0.11**		0.06	
	(0.04)	0.01	(0.05)	0.38
Plans life	**0.08**		**0.13**	
	(0.03)	0.01	(0.04)	0.01
Evaluates life	-0.01		-0.05	
	(0.04)	0.89	(0.04)	0.23
Useful Role	**0.35**		**0.35**	
	(0.07)	0.00	(0.08)	0.00
Affiliation				
Respects others	**0.12**		0.08	
	(0.06)	0.04	(0.06)	0.08
Takes holidays	**0.29**		0.00	
	(0.11)	0.01	(0.14)	0.93
Self Worth	**0.31**		**0.26**	
	(0.06)	0.00	(0.08)	0.01

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Table 4.5: Model Estimation for Sub-samples by Age Group

	OLS	Ordered Logit p value*	OLS	Ordered Logit p value*
	Under 45		Over 45	
Control over one's environment				
Past racial discrimination (work)	**-0.28**		**-0.94**	
	(0.23)	0.74	(0.26)	0.00
Future racial discrimination (work)	0.06		0.05	
	(0.04)	0.13	(0.06)	0.20
Expects stop and search	**-0.07**		-0.03	
	(0.03)	0.01	(0.04)	0.21
Skills used at work	**0.09**		0.08	
	(0.04)	0.01	(0.05)	0.18
Demographics				
In work	-0.27		**-0.63**	
	(0.21)	0.09	(0.28)	0.06
Expect to work	**-0.29**		-0.26	
	(0.14)	0.02	(0.16)	0.05
Age	-0.02		0.01	
	(0.03)	0.43	(0.02)	0.75
Age^2	0.00		0.00	
	(0.00)	0.51	(0.00)	0.85
Household Income	0.00		**0.11**	
	(0.04)	0.95	(0.04)	0.01
South of England	-0.08		-0.26	
	(0.14)	0.47	(0.16)	0.09
Midland and Wales	0.18		-0.08	
	(0.14)	0.23	(0.16)	0.59
North of England	-0.14		-0.16	
	(0.13)	0.30	(0.15)	0.29
Scotland	-0.02		0.05	
	(0.17)	0.80	(0.20)	0.88

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Table 4.5: Model Estimation for Sub-samples by Age Group

	OLS	Ordered Logit p value*	OLS	Ordered Logit p value*
	Under 45		Over 45	
Personality				
Extravert	**0.12**		0.01	
	(0.03)	0.00	(0.04)	0.83
Agreeable	-0.06		-0.03	
	(0.04)	0.11	(0.05)	0.88
Conscientious	-0.05		-0.05	
	(0.04)	0.20	(0.04)	0.24
Stable	**0.13**		**0.11**	
	(0.04)	0.00	(0.04)	0.00
Open to experience	-0.06		-0.03	
	(0.04)	0.33	(0.05)	0.85
R^2	0.58		0.60	
Adjusted R^2	0.55		0.56	
Log likelihood	-523.90		-432.00	
Observations	418		360	

Note: OLS Standard errors in parenthesis; significant at 5% in bold
*The p values are those associated with the coefficients from an ordered logit model estimated on the same set of variables as used for the OLS model

that could not be the whole story as age-related adaptation does not explain why, for example, the coefficient of *Expresses feelings* is significant for the older group, but not the younger group, a finding that suggests the opposite of adaptation.

In short, to interpret these data, care is warranted and a number of analyses are necessary before any conclusions can, be drawn, even

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tentatively. Nonetheless, some final comments are warranted. Firstly, although the focus of the discussion of the results has been on the significance of coefficients, some researchers have commented on the relatively high R^2 values reported throughout (0.5 to 0.6 compared with 0.4 to 0.5 in psychology). A number of the items in the Emotions, Practical Reason and Affiliation, categories are taken, via the BHPS, from work related to mental health and so it is perhaps not surprising that they turn out to be partly constitutive of life satisfaction. However, it is consistent both with theoretical concerns about materialism in the capabilities approach, as well as empirical evidence from the happiness literature, which shows that income is only weakly related to life satisfaction. The implications depend on the preferred theory of justice but where poverty proves stubbornly resistant to attempts at alleviation by conventional economic means, it suggests that a wider range of quality of life issues, if addressed by policy, could have a significant impact on quality of life.

These considerations raise a second point about the relationship between the capabilities approach and the emerging literature on the economics of happiness. Both have origins that include literatures outside economics but perhaps because of their very different methodological

underpinnings, there has been very little constructive engagement between the two traditions to this point. The attitude to utilitarianism, which in turn provided foundations for traditional welfare analysis, is a key issue that has tended to divide these two traditions but we are not compelled to accept this. For one thing, the substantive content of particular versions of the capabilities approach, as well as the general recognition by all versions of the approach helps provide content that can be used in happiness research: the 60 plus variables used here make that point unambiguously. Whether there is a contribution the other way, i.e. from the research on the economics of happiness to the capabilities approach has become a more open ended question because of the implications that are thought to follow from making allowance for the adaptive aspect of preferences. Both camps recognise that such aspects are significant for issues of welfare assessment and the fact that this in itself represents an agreement that goes beyond what is assumed in textbook welfare economics to which most students and policy-makers are exposed should not be ignored. So long as adaptation is not both instantaneous and complete, then changes in valued capabilities can be expected to be reflected by changes in life satisfaction. Layard (2005) suggests that the economic policy consequence of adaptation is that we

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should focus on areas where preferences are resistant to change and there are situations where this might well make sense. For example, there is evidence (Brouwer et al, 2005) that people find reduced physical mobility as they become older acceptable whereas the same is not true of pain, a fact that suggests pain alleviation be given a relatively high priority. Capabilities researchers are not committed to rejecting such an approach though they would refine Layard's point by saying that there are some adaptations which need to be discounted – for example, the acceptance of discrimination. And yet it seems difficult to think that anyone trying to operationalise the capabilities approach would not, at some point, want to consult some kind of evidence regarding those capabilities that have a beneficial impact on life satisfaction. There are bridges to be built between the capabilities and life satisfaction camps and this chapter illustrates one way in which they might be constructed.

4.4 Conclusion

The motivation for this chapter was to address the issue of the dearth of detailed information about people's capabilities combined with the need for such information that new approaches to welfare economics require.

Using an account of which capabilities are valuable that shares many elements with a wide variety of other accounts, a survey instrument was constructed which provides indicators of capability across a wide range of life domains and issues. The research reported here demonstrates the feasibility of devising such indicators. It also suggests that lists such as Nussbaum's benefit from further development if they are to generate data that speaks more directly to the interaction between economic activity and human welfare. Nonetheless, the questions developed here provide an illustration of the economic and social statistics that the capabilities approach requires for its operationalisation with quantitative empirical work.

For present purposes, the resulting data on capabilities was analysed by asking what evidence there was for relations between capabilities and life satisfaction, a variable now used frequently by labour and other economists. Using backward elimination a short(er) list of capability indicator variables for which there is the strongest evidence of a statistical link to subjective well-being was developed. Subsequent analyses suggested that the relations were reasonably robust with respect to the addition of socio-demographic and personality variables. The substantive picture obtained is one in which

life-satisfaction is highly multivariate with respect to capabilities, a finding that underlines the value of the vector approach to welfare that Sen advocates as well as the multivariate treatment of poverty that is attracting increasing support. The results suggest that whilst there may be some gender and age differences, signs, particularly when comparing females and males are generally the same suggesting that any gender differences in the relationship between capability and life satisfaction is primarily quantitative rather than qualitative

In future work benefits would be obtained from tailoring samples to focus on specific issues, like the impacts of constraints on reproductive choice, or the role of ethnicity. From a practical perspective, it would also be particularly valuable to link some of the capability indicators of the sort developed here to environmental variables, which policy-makers can influence. Nonetheless, this chapter brings both an economics and a social statistics approach to bear on a philosophically principled oriented approach to welfare economics in a way that should be of value to both those interested in the operationalisation of this approach and also to those doing applied empirical work in the area of life satisfaction. Focusing on capabilities or opportunities is especially important where preferences are at

least partially heterogeneous, an assumption that appears to be confirmed rather starkly in the analyses by gender and to a lesser extent, by those for age. Findings apart, the questions developed here illustrate the sorts of data that policy-makers and capability researchers alike could gather both in one-off and in regular surveys. The capabilities approach is undoubtedly a useful complement to conventional analysis and one that the analysis in this chapter suggests that speaks particularly explicitly to measurement issues of choice and the multivariate nature of well-being and poverty.

The main contribution of this chapter has been to demonstrate that, within the conventions of household and social surveys, indicators of capabilities can be obtained. Substantively, the findings show that many of these indicators are linked to life satisfaction thereby adding support to the contention that the capability approach provides a more fruitful area of research when examining the constituents of a "good life" than a focus on pure economic factors.

Appendix 4.1 Ten Item Personality Inventory

Extravert	I see myself as extraverted, enthusiastic.
	I see myself as reserved quiet,
Agreeable	I see myself as critical quarrelsome,
	I see myself as sympathetic, warm,
Conscientious	I see myself as dependable, self-disciplined,
	I see myself as disorganised, careless,
Emotionally Stable	I see myself as anxious, easily upset,
	I see myself as calm, emotionally stable,
Open to experiences	I see myself as open to new experience, complex,
	I see myself as conventional, uncreative

(Disagree strongly = 1, Disagree moderately = 2, Disagree a little = 3, Neither agree nor disagree = 4, Agree a little = 5, Agree moderately= 6 Agree strongly = 7)

Appendix 4.2 Comparison with BHPS results

	This Survey		BHPS (Wave 10)		pairwise t-test
	Mean	Std Dev	Mean	Std Dev	p value
Adequately nourished	0.97	0.17	0.98	0.14	0.06
Education	0.60	0.49	0.47	0.49	0.27
Lost sleep	2.06	0.86	1.90	0.78	0.19
Under strain	2.31	0.88	2.13	0.78	0.20
Takes holidays	0.79	0.40	0.83	0.37	0.10
Meets friends	0.63	0.48	0.94	0.23	0.65
Self worth	1.72	0.90	1.44	0.69	0.31
Age	44.13	15.08	43.59	15.64	0.04
Sex	0.45	0.50	0.47	0.50	0.04

Chapter 5 Capabilities and Life Events

5.1 Introduction

The capability approach focuses on what an individual is able to do and to be. This in turn enables them to lead a life they have reason to value. In distinguishing between the doing and beings of an individual, their functionings, and their capabilities, the possible combinations of functions that an individual can achieve, the capability approach attempts to deal with the issue of people being conditioned by their background and culture. Such conditioning can lead individuals to adapt to a limited set of possibilities. Sen (1987, p11) encapsulates the problem in his happy slave analogy;

> 'The battered slave, the broken unemployed, the hopeless destitute, the tamed housewife, may have the courage to desire little, but the fulfilment of those disciplined desires is not a sign of great success and cannot be treated in the same way as the fulfilment of the confident and demanding desires of the better placed.'

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Similarly Martha Nussbaum (2001) who further extended the capability approach describes Vasanti who;

> '... thought that abuse was painful and bad, but still, a part of women's lot in life, just something women have to put up with as part of being a women dependent on men, and entailed by having left her own family to move into a husband's home. The idea that ... *she herself* had rights that were being violated by his conduct – she did not have these ideas as that time ...'

In response to this issue, the capability approach argues for capabilities that are not based on one particular set of cultural values, but rather are based on universal human values, those that allow individuals to choose to live a life, that they have reason to value.

The issue of adaptation has also received some attention in the happiness literature, which uses a subjective measure of an individual's satisfaction with their life. Some e.g. Costa and McCrae (1980, 1984) argue that since satisfaction with life depends primarily on personality there is a large degree of adaptation. They argue that extraversion, neuroticism accounts for much of the variance in levels of satisfaction with life between

individuals, and that personality predicts their level of satisfaction with life 20 years later. Since as Costa, McCrae, and Arenburg (1983) have identified, extraversion and neuroticism are highly stable traits this would imply that satisfaction with life is highly stable. Stable personality traits may of course themselves be related to other personal characteristics. Tall handsome men may have an outgoing personality but this may be the result of other people's reaction to them. Hedley and Wearing (1989) propose a restricted form of adaptation in which individuals have a 'normal' equilibrium level of life events allowing satisfaction with life to be predictable based on age and personality. In this dynamic equilibrium model it is only when events deviate from their equilibrium level that satisfaction with life changes. Other studies have confirmed this tendency for satisfaction to return to its "normal" level. Brickman, Coates, and Janoff-Bulman (1978) in what they describe as their hedonic treadmill model, found that following both a major favourable event (winning a state lottery) and a major adverse event (becoming a quadriplegic or paraplegic), satisfaction with life quickly reverted to its previous level. In a review of this model Diener et al (2006) argue that among the revisions required are a recognition that set points will vary considerably across individuals due, at

least in part, to inborn personality based influences and that individuals exhibit differences in their rate and extent of adaptation to the same event. Clarke et al. (2008), found evidence of adaptation to 6 life events; unemployment, marriage, divorce, widowhood, birth of a child and layoff, and identified that although the strongest impact on satisfaction with life appears at the time these events occur there were significant lags and leads. They also discovered notable differences in the timescale of adaptation and concluded that satisfaction with life contains and important inter temporal dimension.

What these and other studies illustrate is that a process of adaptation to events is generally accepted in the social sciences and needs to be taken account of in any attempt to measure an individual's subjective assessment of their situation. However, at the heart of the capabilities approach is the concept of agency which argues that capabilities are not exogenous but rather are open to some extent to individuals influence or choice so the process of adaptation does not have to be automatic.

As discussed in previous chapters, measuring capabilities imposes a further challenge to researchers in that they need to identify not only the current status of an individual but why that status exists. They need to

identify the possibilities that are open to individuals rather than merely what an individual chooses to do. In this chapter, data from the British Household Panel is again used to investigate the effect of two external shocks; unemployment, and widowhood on an individual's capability level and the extent to which they adapt to these changed circumstances.

The previous chapter showed the importance of considering personality when considering an individual's capabilities and thus the personality information from Wave 15 of the British Household Panel, (the first wave to capture such data) is used to explore some of the effects

5.2 Model

If people adapt to their situation, their current level of capabilities will be a function of the previous levels of their capability. Formally

$$c_{it} = \sum_{n=t-T}^{t} c_{in} + p_i + \varepsilon_{it}$$

where c_{it} is the level of capability of individual i at time t, p_i are some person specific characteristics and ε_{it} is an error term. In this chapter fixed effects regressions are used to investigate this relationship.

The data used is waves 1 – 15 of the British Household Panel (BHPS) covering the years 1991 – 2005. The dependent variable is a measure of general health calculated by summing the answers to 12 questions relating to an individual's well-being. The twelve questions cover, concentration, loss of sleep, playing a useful role, being able to make decisions, being constantly under strain, having a problem, overcoming difficulties, enjoying day-to-day activities, having the ability to face problems, being unhappy or depressed, losing confidence, believing in self-worth, and general happiness. As Appendix 5.1 shows these twelve questions map to four of Nussbaum's (2001) capability areas; Emotions, Practical Reason, Affiliation, and Play and thus can be taken as a partial index of capabilities.

In the BHPS respondents answer each of the twelve questions using a four point scale; better than usual, same as usual, less than usual, much less than usual; or, not at all, no more than usual, rather more than usual, much more than usual. The answers are coded from 0 to 3 and summed to give a scale running from 0, to 36, and can be taken as a measure of an individual's distress with those most distressed having a score of 36. In summing the scores, each question is given equal waiting which is

consistent with Nussbaum's contention that each capability is of equal value. For our purposes, the scale is inverted so that 0 signifies a low level of capability and 36 a high level. Figure 1 shows the distribution of the data, which has a mean value of 24.83 and median value 26.00.
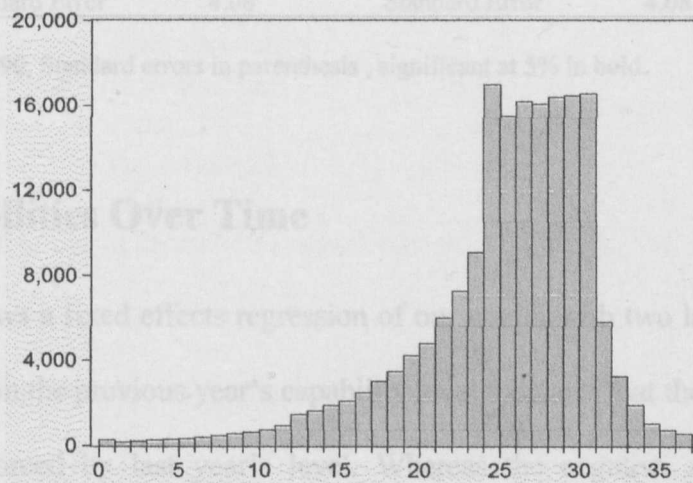
Figure 1: Distribution of Capability variable.

Table 5.2, which shows, the effect of age on capabilities suggests that capabilities decline with age although at a slower rate as they grow older. There is also a slight decline in the mean capability level over the 15 years of the data possibility reflecting an ageing of the population (from a mean age in 1991 of 44.42 to 45.93 in 2005).

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Table 5.2: Capabilities Log Age and Log Year

Variable	Coefficient	Variable	Coefficient
Constant	31.417	Constant	25.409
	(0.404)		(0.0353)
Log Age	1.776	Log Year[1]	-0.290
	(0.109)		(0.017)
R^2	0.52	R^2	0.52
Adjusted R^2	0.43	Adjusted R^2	0.43
Standard Error	4.08	Standard Error	4.08

[1]Base year is 1990, Standard errors in parenthesis , significant at 5% in bold

5.3 Capabilities Over Time

Table 5.3 shows a fixed effects regression of our model with two lags. The positive sign on the previous year's capability level indicates that the current level is reinforced by last year's level. Whereas the negative signs on Capability$_{t-2}$ suggests that prior years' capability levels reduce this effect. Such a model suggests that, following a shock and in the absence of further shocks, the level of capability will stabilise at a constant level for each individual implying that there is adaptation to previous levels of capability. However as Nickell (1981) and others have pointed out the estimates from finite sample autoregressive fixed-effects dynamic panel models are biased downwards.

Table 5.3: Capabilities Over Time

Variable	Coefficient
Constant	**24.432**
	(0.111)
Capability$_{t-1}$	**0.043**
	(0.003)
Capability$_{t-2}$	**-0.029**
	(0.003)
Panel Observations	119,127
Cross Sections	19,707
Adjusted R^2	0.44
Log Likelihood	-324582
Periods	13

Note: Standard errors in parenthesis; significant at 5% in bold

Although the bias reduces as the number of periods in the sample increases, it is considerable for a small number of periods. If the estimate is positive, the bias is negative and the larger its value the larger is the bias but it does not disappear as the estimate goes to zero. Thus, the negative autoregression on the second lag may simply be the Nickell downward bias. Table 5.1 shows that capabilities decline over time, which would also lead to a negative autocorrelation so caution needs to be exercised when interpreting results using lagged values of the dependent variable. However the coefficients on the lagged capabilities are fairly small so excluding them

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would not have a major effect on the results and this is considered in the next section.

5.4 Capabilities and External Shocks

We now turn to how capabilities respond to external shocks and consider three; unemployment, becoming widowed and ill-health. Unemployment is considered first

5.4.1 Capabilities and unemployment

Table 5.4.1.1 shows the effect of an unemployment shock on capability levels. The left hand column gives the results without the lagged dependant variable as a regressor. In this case, the long run effect of unemployment on capabilities is given by summing the coefficients on the unemployed regressors to give -1.20 and indicating that in the long run being unemployed reduces an individual's capability level by 1.2 points. The long run effect of unemployment from the right hand regression with the lagged dependant variable is given by the sum of the coefficients on the unemployed variables divided by 1- the coefficient on the lagged dependant variable to give -1.19. Thus the two results indicate that the effect of being

Table 5.4.1.1: Capabilities and Unemployment

Variable	Coefficient	Coefficient
Constant	**24.867**	**23.262**
	(0.015)	(0.092)
Unemployed$_{t+1}$	**-0.387**	**-0.374**
	(0.105)	(0.105)
Unemployed$_t$	**-1.3526**	**-1.338**
	(0.101)	(0.100)
Unemployed$_{t-1}$	**0.303**	**0.391**
	(0.097)	(0.097)
Unemployed$_{t-2}$	**0.234**	**0.203**
	(0.093)	(0.093)
Capability$_{t-1}$		**0.064**
		(0.004)
Individual Fixed Effects not reported		
R^2	0.51	0.51
Adjusted R^2	0.43	0.43
Standard Error	4.06	4.05
Periods 12	12	12
Cross-sections	12730	12730
Observations	87123	87123

Standard errors in parenthesis , significant at 5% in bold

unemployed on capability levels is similar, (a reduction of 4.8% at the mean value), although the right hand regression will suffer from the Nickel bias discussed in the previous section. In view of the similarity in the two regressions in Table 5.4.1.1, the issue of possible Nickell bias is avoided by excluding lagged dependent variables from our next regressions.

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To investigate the effect of being unemployed on capability levels the left hand model in table 5.4.1.1 is developed further by introducing controls for socio demographic variables. These are; age, income and eleven geographical regions North East, North West, Yorkshire and The Humber, East Midlands, West Midlands, East of England, South East, South West, Wales, Scotland with London as the base case, and investigating the differences between males and females. The results are show in Table 5.4.1.2

The negative effect of the anticipation of being unemployed on an individual's capability level can be seen by the negative coefficient on Unemployed$_{t+1}$ although this appears to be mainly as a result of the effect on females. The event of being unemployed also has a negative effect on the capability level for both males and females but the positive coefficient on Unemployed$_{t-1}$ suggest that the experience of being unemployed reduces the impact indicating that there is some adaptation to being unemployed. Adaptation however is not complete since if the individual remains

Table 5.4.1.2: Capabilities, Unemployment and Demographics

	All	Male	Female
Constant	**26.590**	**28.081**	**25.357**
	0.330	0.449	0.474
Unemployed$_{t+1}$	**-0.253**	-0.077	**-0.503**
	0.091	0.112	0.147
Unemployed$_t$	**-1.433**	**-1.496**	**-1.406**
	0.089	0.108	0.145
Unemployed$_{t-1}$	**0.389**	**0.529**	0.169
	0.086	0.103	0.141
Age	**-0.058**	**-0.111**	-0.017
	0.012	0.017	0.017
Monthly Income/£1000	0.016	0.020	0.012
	0.011	0.016	0.016
Yorkshire and The Humber	0.238	**0.924**	-0.289
	0.289	0.392	0.420
East Midlands	0.460	**1.022**	-0.017
	0.261	0.350	0.381
West Midlands	0.212	**0.985**	-0.395
	0.288	0.403	0.405
South West	**0.500**	**0.993**	0.107
	0.236	0.324	0.339
Wales	**0.828**	**1.220**	0.464
	0.340	0.449	0.505
Scotland	**1.097**	**1.052**	**1.178**
	0.357	0.483	0.517

Regional Dummies Coefficients for other region not significant
Individual Fixed Effects not reported

	All	Male	Female
R^2	0.50	0.52	0.48
Adjusted R^2	0.42	0.44	0.40
Periods	13	13	13
Cross-sections	14,123	6,606	7,517
Observations	102,766	46,752	56,014

Note: Standard errors in parenthesis; significant at 5% in bold

unemployed their capability level remains below their level prior to the shock.

On being re-employed, there is an immediate recovery in the capability level but not to the previous level. The model suggests that in the following year the capability level will actually be higher than before the shock. It will then fall so that two years following the removal of the shock it will settle back to its previous level.

Males show a decline in their overall capabilities with age. Males in four English regions together with Wales and Scotland show a higher starting level of capabilities compared to the base case of London   .

This fall in the capability level would be consistent with a fall in some of the key constituents in Nussbaum's (2001) list of capabilities. These include, "Not having one's emotional development blighted by fear and anxiety", being able to "engage in various forms of social interaction" and "being able to be treated as a dignified being" all of which would be restricted by a prolonged period of unemployment.

The capability index used is a partial index of capabilities limited by the extent of the data available in the BHPS but we can disaggregate this

overall index into some of its constituents to compare the effect of the shocks on each one. Tables 5.4.1.3 and 5.4.1.4 consider two of these, being able 'to enjoy ... day to day activities' and being 'capable of making decisions'.

The decision making capability is identified using the responses to the question 'Have you recently...felt capable of making decisions about things?' which is answered on a four point scale: More so than usual, Same as usual, Less so than usual, and Much less capable. This is the dependent variable in Table 5.3.2[21]. In this case males suffer an anticipation effect and an adaptation effect whereas the effect for women is felt solely by the event itself, and the overall impact on decision making ability is slightly

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[21]Many econometrics textbooks argue that when a limited dependent variable is used, linear regression models are inappropriate and nonlinear models such as probit and tobit are preferred. Here, ordinary least squares(OLS) has been used on the basis that as Angrist and Pischke (2009) argue the added complexity and extra work required to interpret the results may not be worth the trouble since OLS has a conceptual robustness that structural models often lack.

stronger for males who suffer a reduction 0.088 points (25.5% of capability level) compared to the overall reduction for females of 0.078 (22.7% of capability level). There is also a decline in the capability with age where women's capability declines at a slightly faster rate. Income does not have a significant effect.

Next, the effect of unemployment on the enjoyment capability is considered. The measure of this capability is obtained from the answers to the question 'Have you recently...been able to enjoy your normal day-to-day activities?' on a four point scale: More so than usual, Same as usual, Less so than usual, Much less than usual. In contrast to the effect of unemployment on the decision capability, in this case, it is females who experience an anticipation effect, but again there is no adaptation effect. For males the effect is felt by the event and again they show adaptation. The overall reduction in their enjoyment capability from unemployment is much stronger (0.135 points) for women than for men (0.017).

The effect of being unemployed for men is mitigated slightly by higher incomes, Table 5.4.1.4 suggests that at a monthly income of around

Table 5.4.1.3: Decision Capability and Unemployment

	All	Male	Female
Constant	**3.449**	**3.454**	**3.444**
	0.036	0.051	0.051
Unemployed$_{t+1}$	**-0.034**	**-0.041**	-0.025
	0.010	0.013	0.016
Unemployed$_t$	**-0.083**	**-0.086**	**-0.078**
	0.010	0.012	0.016
Unemployed$_{t-1}$	**0.033**	**0.039**	0.026
	0.009	0.012	0.015
Age	**-0.012**	**-0.010**	**-0.013**
	0.001	0.002	0.002
Monthly Income/£1000	0.000	0.000	0.000
	0.001	0.002	0.002

Regional Dummies Coefficients not significant
Individual Fixed Effects not reported

	All	Male	Female
R^2	0.33	0.35	0.32
Adjusted R^2	0.23	0.24	0.21
		.	
Periods	13	13	13
Cross-sections	14,140	6,617	7,523
Observations	103,417	46,999	56,418

Note: Standard errors in parenthesis; significant at 5% in bold

£4,000 there would be no overall impact. Males in Wales have a significantly higher starting value compared to the London (the base case for the regional dummies).

The models in the tables above indicate that women and men experience unemployment differently. There is some adaptation for men but not for women. Men suffer an anticipation effect in terms of their decision

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Table 5.4.1.4: Enjoyment Capability and Unemployment

	All	Male	Female
Constant	**2.926**	**2.978**	**2.880**
	0.042	0.060	0.058
$Unemployed_{t+1}$	**-0.024**	-0.006	**-0.050**
	0.012	0.015	0.018
$Unemployed_t$	**-0.070**	**-0.064**	**-0.085**
	0.011	0.014	0.018
$Unemployed_{t-1}$	**0.023**	**0.047**	-0.014
	0.011	0.014	0.017
Age	0.001	-0.001	0.003
	0.002	0.002	0.002
Monthly Income/£1000	-0.003	**-0.004**	-0.002
	0.001	0.002	0.002
Wales	**0.109**	**0.134**	0.077
	0.043	0.060	0.062

Other Regional Dummies Coefficients not significant
Individual Fixed Effects not reported

	All	Male	Female
R^2	0.32	0.32	0.32
Adjusted R^2	0.21	0.21 ·	0.21
Periods	13	13	13
Cross-sections	14,139	6,615	7,524
Observations	103,450	47,015	56,435

Note: Standard errors in parenthesis; significant at 5% in bold

making capability whereas for women the anticipation effect is felt on their ability to enjoy their day to day activities.

5.4.2 Capabilities and becoming widowed

The next shock to be considered is that of being widowed. Table 5.4.2.1 shows the effect of this shock on the overall capability level.

Although the long run effect of becoming widowed has a slight negative effect on the capability level for the whole sample reducing it by 0.12 points (or 0.5% from the base value) this is as a result of a larger negative effect for women (0.42 points or 1.7% from the base level). Both the anticipation effect and the event itself have a stronger negative effect than for men. The overall effect of being widowed for men is significant and positive (0.55 points or 2.0% from the base level) whereas for women it is significantly negative (-0.42 points or -1.7% from the base level). This suggests that being married may restrict the possibilities open to the male but increase those open to the female. The effect on two of their capabilities; their ability to make decisions and to enjoy life is considered below. The decline in the capability level with age is significant for men but not for women. The anticipation effect for women is stronger than for men but although the year one adaptation effect is less, the overall adaptation level is similar (3.7 points for women and 3.6 for men). There are positive differences in the base level, for all regions compared to London, for men in all regions other than the North East.

Table 5.4.2.1: Capabilities and Being widowed

	All	Male	Female
Constant	**26.356**	**28.004**	**24.993**
	0.386	0.523	0.558
Widowed$_{t+1}$	**-1.450**	**-0.872**	**-1.724**
	0.173	0.293	0.220
Widowed$_t$	**-2.286**	**-2.148**	**-2.356**
	0.196	0.350	0.243
Widowed$_{t-1}$	**2.012**	**2.244**	**1.932**
	0.201	0.353	0.251
Widowed$_{t-2}$	**1.605**	**1.331**	**1.732**
	0.184	0.322	0.230
Age	**-0.058**	**-0.119**	-0.009
	0.014	0.020	0.020
Monthly Income/£1000	0.017	0.022	0.014
	0.012	0.017	0.017
North East	-0.241	-0.059	-0.454
	0.399	0.544	0.576
North West	0.336	**1.029**	-0.192
	0.305	0.421	0.434
Yorkshire and The Humber	0.192	**0.987**	-0.360
	0.322	0.443	0.462
East Midlands	0.363	**1.206**	-0.324
	0.290	0.393	0.420
West Midlands	0.244	**1.078**	-0.403
	0.321	0.455	0.450
East of England	0.319	**0.937**	-0.266
	0.323	0.425	0.480
South East	0.146	**0.764**	-0.343
	0.199	0.271	0.288
South West	0.467	**1.275**	-0.160
	0.264	0.363	0.378
Wales	**1.049**	**1.614**	0.542
	0.375	0.499	0.552
Scotland	**1.037**	**1.108**	1.042
	0.401	0.544	0.580

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Individual Fixed Effects not reported

R^2	0.51	0.52	0.49
Adjusted R^2	0.43	0.44	0.41
Periods	12	12	12
Cross-sections	12,502	5,792	6,710
Observations	88,538	40,131	48,407

Note: Standard errors in parenthesis; significant at 5% in bold

Contemplating the possibility of widowhood, would also lead to 'fear and anxiety', and make engaging "in critical reflection about the planning of one's life" (another of the constituents of Nussbaum's description of the practical reason capability) difficult. The caring requirements and the resultant emotional toll involved in dealing with widowhood would also reduce the opportunity for "being able to laugh, play, and to enjoy recreational activities" which make up Nussbaum's description of the play capability. The effect on decision capability and the enjoyment capabilities is examined in more detail in Tables5.4.2.2 and 5.4.2.3

Table 5.4.2.2 shows the effect of being widowed on decision capability. The event has a negative impact on men's decision capability but this is more than compensated for by the adaptation effect suggesting that

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Table 5.4.2.2: Decision Capability and Being Widowed

	All	Male	Female
Constant	**3.496**	**3.525**	**3.469**
	0.042	0.059	0.060
Widowed$_{t+1}$	-0.027	-0.018	-0.032
	0.019	0.033	0.023
Widowd$_t$	**-0.105**	**-0.086**	**-0.113**
	0.021	0.039	0.026
Widowed$_{t-1}$	**0.052**	**0.075**	0.043
	0.022	0.039	0.027
Widowed$_{t-2}$	**0.048**	**0.068**	0.040
	0.020	0.036	0.025
Age	**-0.014**	**-0.014**	**-0.015**
	0.002	0.002	0.002
Monthly Income/£1000	0.000	0.000	0.000
	0.000	0.000	0.000

Regional Dummies Coefficients not significant
Individual Fixed Effects not reported

	All	Male	Female
R^2	0.34	0.35	0.32
Adjusted R^2	0.23	0.24	0.22
Periods	12	12	12
Cross-sections	12,517	5,797	6,720
Observations	89,083	40,337	48,746

Note: Standard errors in parenthesis; significant at 5% in bold

their ability to make decisions is better following widowhood than before.

For women only the event of becoming widowed has a significant negative effect on their decision making capability. Neither the anticipation effect nor the adaptation effect is significant (at the 5% level) suggesting that women's decision making ability is lower following widowhood.

Table 5.4.2.3: Enjoyment Capability and Being Widowed

	All	Male	Female
Constant	**2.906**	**2.963**	**2.859**
	(0.049)	(0.069)	(0.068)
Widowed$_{t+1}$	**-0.142**	**-0.127**	**-0.149**
	(0.022)	(0.038)	(0.027)
Widowd$_t$	**-0.130**	-0.075	**-0.150**
	(0.025)	(0.045)	(0.030)
Widowed$_{t-1}$	**0.230**	**0.237**	**0.228**
	(0.025)	(0.046)	(0.030)
Widowed$_{t-2}$	**0.114**	0.072	**0.132**
	(0.023)	(0.042)	(0.028)
Age	0.001	-0.002	0.003
	(0.002)	(0.003)	(0.002)
Monthly Income/£1000	-0.003	-0.003	-0.003
	(0.002)	(0.002)	(0.002)
West Midlands	**0.085**	0.109	0.067
	(0.040)	(0.060)	(0.055)
South West	0.064	**0.095**	0.038
	(0.033)	(0.048)	(0.046)
Wales	**0.163**	**0.199**	0.124
	((0.047)	(0.066)	(0.067)
Scotland	**0.115**	0.071	**0.153**
	(0.051)	(0.072)	(0.071)

Other Regional Dummies Coefficients not significant
Individual Fixed Effects not reported

R^2	0.33	0.33	0.33
Adjusted R^2	0.22	0.21	0.22
Periods	12	12	12
Cross-sections	12,515	5,797	6,718
Observations	89,108	40,347	48,761

Note: Standard errors in parenthesis; significant at 5% in bold

Both men and women experience a similar negative effect on their decision making capability with age.

Table 5.4.2.3 shows that the overall effect of becoming widowed on the enjoyment capability is positive for both men and women. The negative anticipation and event effects are more than compensated for by the adaptation effects so that women's enjoyment capability is 0.06 points or 2.1% higher than the base figure after becoming widowed and men's 0.11 or 3.6% higher. Men in the South West and Wales have a higher base figure than the other regions as do women in Scotland.

5.4.3 Capabilities and ill-health

In thirteen of the fifteen years included in the BHPS data set examined in this chapter the question 'Does your health in any way limit your daily activities compared to most people of your age?' allowing the responses to be analysed to investigate the relationship between ill-health and capabilities. The first relationship to be examined is that between ill-health and the overall level of capabilities shown in Table 5.4.3.1.

The anticipation for both men and women is strong with the impact for men being higher than for women two periods out from the event.

Table 5.4.3.1: Capabilities and Ill-Health

	All	Male	Female
Constant	**28.236**	**29.410**	**27.308**
	0.588	0.806	0.843
Health Limited$_{t+2}$	**-0.384**	**-0.499**	**-0.317**
	0.089	0.132	0.120
Health Limited$_{t+1}$	**-0.588**	**-0.567**	**-0.602**
	0.089	0.135	0.120
Health Limited$_t$	**-1.916**	**-1.653**	**-2.074**
	0.091	0.137	0.121
Health Limited$_{t-1}$	-0.138	-0.174	-0.116
	0.091	0.136	0.123
Age	**-0.118**	**-0.155**	**-0.091**
	0.022	0.031	0.032
Monthly Income/£1000	0.018	0.012	0.021
	0.022	0.030	0.032
East of England	**-1.461**	-0.802	**-2.147**
	0.521	0.677	0.788
South East	**-0.718**	-0.064	**-1.283**
	0.303	0.417	0.434

Regional dummies coefficients for other region not significant
Individual fixed effects not reported

R^2	0.61	0.62	0.59
Adjusted R^2	0.45	0.47	0.42
Periods	6	6	6
Cross-sections	13,675	6,304	7,371
Observations	47,231	21,446	25,785

Note: Standard errors in parenthesis; significant at 5% in bold

The coefficient on Health Limited$_{t-1}$ for both is not significant at the 5% level indicating that neither experiences adaptation to ill-health. The overall effect of ill-health is stronger for women (a reduction of 2.9 points or 11% on the base level) than for men(a reduction of 2.7 points or 9.2% on base.

Table 5.4.3 2: Decision Capability and Ill-health

	All	Male	Female
Constant	**3.391**	**3.318**	**3.446**
	(0.066)	(0.092)	(0.093)
Health Limited$_{t+2}$	**-0.021**	-0.025	-0.020
	(0.010)	(0.015)	(0.013)
Health Limited$_{t+1}$	**-0.037**	**-0.036**	**-0.038**
	(0.010)	(0.015)	(0.013)
Health Limited$_t$	**-0.101**	**-0.072**	**-0.118**
	(0.010)	(0.016)	(0.013)
Health Limited$_{t-1}$	0.000	0.003	-0.002
	(0.010)	(0.016)	(0.014)
Age	**-0.007**	-0.003	**-0.010**
	(0.002)	(0.004)	(0.003)
Monthly Income/£1000	-0.003	0.001	-0.005
	(0.003)	(0.003)	(0.004)
North East	**-0.169**	**-0.202**	-0.153
	(0.068)	(0.099)	(0.095)

Regional dummies coefficients for other regions not significant
Individual fixed effects not reported

R^2	0.46	0.48	0.45
Adjusted R^2	0.24	0.26	0.23
Periods	6	6	6
Cross-sections	13,718	6,325	7,393
Observations	47,564	21,576	25,988

Note: Standard errors in parenthesis; significant at 5% in bold

level). This coupled with a decline in the capability level with age results in

a strong reduction in capabilities over time if the reason for health limiting

activities persists

The effect of ill-health on the decision capability shown in Table 5.4.3.2, again indicates a stronger impact for women than men with the overall effect being a reduction in decision capability of 0.18 points (5.1% of the base level) compared to that of 0.16 for men(4.0% of the base level). Age is not significant at the 5% level for men but contributes a further decline of 0.01 points or 0.3% for women. Men in the North East have a higher base level then in the other regions.

Table 5.4.3.3 shows that ill-health has a stronger anticipation effect on the enjoyment capability of women and that for men the negative impact of ill-health is reinforced after the event. The overall impact for women is stronger at 0.35 points or 12.0% of the base level whereas for men there is a decline of 0.30 or 10.1% of the base level.

These tables suggest that men and women experience the impact of a shock differently on different capabilities. Women experience a negative anticipation effect on their enjoyment capability whereas for men this only occurs on anticipating widowhood. Men experience an anticipation effect on their decision making capability from unemployment or ill-health shocks but for women this only occurs for ill-health. The adaptation effect is more

Table 5.4.3.3: Enjoyment Capability and Ill-health

	All	Male	Female
Constant	**2.972**	**2.988**	**2.959**
	0.057	0.082	0.080
Health Limited$_{t+1}$	**-0.070**	**-0.046**	**-0.085**
	0.009	0.014	0.012
Health Limited$_t$	**-0.250**	**-0.221**	**-0.269**
	0.009	0.014	0.012
Health Limited$_{t-1}$	**-0.021**	**-0.035**	-0.012
	0.009	0.014	0.012
Age	-0.003	-0.004	-0.003
	0.002	0.003	0.003
Monthly Income/£1000	-0.003	-0.005	0.000
	0.002	0.003	0.003
South West	**0.088**	0.089	0.093
	0.041	0.059	0.057

Other Regional Dummies Coefficients not significant
Individual Fixed Effects not reported

R^2	0.41	0.41	0.40
Adjusted R^2	0.24	0.24	0.23
Periods	8	8	8
Cross-sections	15,407	7,177	8,230
Observations	69,215	31,539	37,676

Note: Standard errors in parenthesis; significant at 5% in bold

prevalent for men, from an unemployment or widowhood shock whist for women this only occurs in their enjoyment capability following widowhood.

5.5 Unemployment compensation

Income was only found to be significant (at the 5% level) in mitigating the effect of an unemployment shock on the enjoyment capability of men. To investigate the role of monetary compensation further data on receiving a windfall, which the BHPS has collected for 10 of the fifteen years of our data, was included. A windfall refers to any one-off receipt of money from any source including; life insurance, pension, personal accident claim, redundancy, employment bonus, inheritance, and a lottery pools win

The results for an unemployment shock on the capability level are shown in Table 5.5.1. Receipt of a windfall in the previous year is significant for men and receipt of a windfall in the current year for women is significant at the 10% level. However, the sums required to compensate for the long run effect of unemployment are considerable of the order of £178,000 pa for men and £475.000 pa for women. The impact of a windfall on both the decision capability and the enjoyment capability was not significant (at the 5% level) for either men or women.

Table 5.5.1: Capabilities, Unemployment and a Windfall

	All	Male	Female
Constant	**25.544**	**27.376**	**23.982**
	0.738	0.999	1.067
Unemployed$_{t+1}$	**-0.485**	-0.162	**-0.787**
	0.147	0.191	0.221
Unemployed$_t$	**-1.490**	**-1.625**	**-1.389**
	0.145	0.185	0.220
Unemployed$_{t-1}$	0.032	**0.468**	**-0.429**
	0.141	0.181	0.214
Age	-0.029	**-0.099**	0.027
	0.028	0.038	0.040
Monthly Income/£1000	0.022	0.019	0.023
	0.015	0.021	0.021
Windfall$_t$/1,000	-0.002	0.000	-0.005
	0.002	0.002	0.003
Windfall$_{t-1}$/1000	0.005	**0.007**	0.003
	0.002	0.002	0.003
North East	0.234	-0.575	1.197
	0.648	0.840	0.982
North West	0.371	**1.460**	-0.627
	0.474	0.649	0.683
Yorkshire and The Humber	0.291	1.130	-0.047
	0.479	0.669	0.687
East Midlands	0.491	**1.437**	-0.233
	0.447	0.599	0.652
West Midlands	-0.007	**1.465**	-1.144
	0.519	0.712	0.742
East of England	1.479	**1.679**	1.425
	0.516	0.672	0.776
South East	0.596	**0.888**	0.384
	0.309	0.415	0.448
South West	0.967	**1.569**	0.509
	0.420	0.587	0.595
Wales	1.682	**3.069**	0.378
	0.620	0.798	0.940
Scotland	0.791	**1.664**	0.093
	0.645	0.845	0.964

R^2	0.58	0.59	0.56
Adjusted R^2	0.46	0.47	0.44
Periods	7	7	7
Cross-sections	11,893	5,473	6,420
Observations	55,337	25,065	30,272

Note: Standard errors in parenthesis; significant at 5% in bold

5.6 Personality and Adaptation

Included in the fixed effects of our base model will be the effect of personality on the process of adaptation. For the first time, wave 15 of the British Household Panel included 15 questions (see Appendix 2) allowing the five personality traits; extraversion, agreeableness, conscientiousness, neuroticism, and openness, to be identified. Respondents answer these questions on a scale from 1 to 7 and the level of each trait is identified by summing the scores for three questions. The level of each of the five personality traits is thus given by a score varying from 3 to 21.

The role of personality in the process of adaptation was investigated by carrying out regressions of the capability level on unemployment on three sub-samples; low (personality score <9), medium (8< personality score <16) and high (personality >15 for each personality trait . The base level of capability for these three samples as would be expected increases as

the personality trait increases. There was no evidence of a difference in the process of adaptation to the shock of being unemployed in the majority of the sub samples but some evidence of slight differences in the sample for those with a low level of neuroticism and for those with a low level of openness. These results are shown in table 5.6.1 together with the results for the complete sample.

Again the long run effect of being unemployed on the capability level can be seen by summing the coefficients on the unemployed variables for each of the samples. Those with a low level of neuroticism suffered a lower reduction in their capability level (-0.89) than for the whole sample (-1.33) partly as a result of lower anticipation effect (shown by the coefficient on unemployed). This was not significantly different from zero at the 5% level. There was also some indication that the year two adaptation effect was lower in that it was not significantly different from zero although a Wald test shows that it is not significantly different from the value for the sample as a whole

For those with a low level of openness these results suggest that there is no anticipation effect (the coefficient is not significantly different from zero) nor adaptation to being unemployed. The coefficients on the two

Table 5.6.1: Capabilities and Unemployment , Personality Sub Samples

	Whole Sample	Sub Samples	
		Low Neuroticism	Low Openness
Constant	**24.923**	**27.021**	**24.317**
	(0.017)	(0.027)	(0.055)
Unemployed$_{t+1}$	**-0.457**	-0.012	0.122
	(0.122)	(0.202)	(0.342)
Unemployed$_t$	**-1.489**	**-1.636**	**-1.799**
	(0.117)	(0.194)	(0.340)
Unemployed$_{t-1}$	**0.354**	**0.555**	-0.356
	(0.113)	(0.187)	(0.335)
Unemployed$_{t-2}$	**0.261**	0.077	-0.421
	(0.109)	(0.178)	(0.322)
R^2	0.47	0.41	0.58
Adjusted R^2	0.4	0.33	0.53
Standard Error	4.12	3.36	3.77
Periods	12	12	12
Cross-sections	7618	2030	647
Observations	66078	17797	5820

Notes: Standard errors in parenthesis; significant at 5% in bold

adaptation variables (unemployed$_{t-1}$ and unemployed$_{t-2}$) are not significantly different from zero. This indicates that on being re-employed their capability level would immediately return to its previous level.

5.7 Conclusion

The so called hedonic treadmill model of adaptation (Brickman and Campbell, 1971) argues that shocks only have a temporary effect on people's situation and that all reactions to life events are relative to one's past experience. Our results give some support to that view where the shock lasts for a limited period but in both the case of becoming unemployed and becoming widowed our results show that where the shock is long lasting so are the results. Of course adaptation is to be expected, after all if an individual has a skill e.g. speaking a foreign language which is not used, the ability to use the language will slowly erode, similarly if an individual has the ability to play the piano but it is not practised the skill will deteriorate. Use of a skill or an ability has an important impact on maintaining its level.

In developing the capability approach, a major motivation for Sen and Nussbaum was to move away from a preference based concept of well-being as a result of their concern that individual's preferences may in part be due to previous experience of deprivation or wealth. However, individuals have to live in some real world in which they have to deal with the good and bad events that happen. as this chapter shows when this happens, events will have an impact on an individual's capability but for

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some events, provided the shock is short lived the capability level will to return to its previous level. If individuals are to maintain or increase their capability level they must continually use the capabilities, if not their capabilities will be eroded by their experience of negative events.

Appendix 5.1: GHQ questions and Nussbaum's Capabilities

Capabilities
What you are able to do and be

Nussbaum's Capability   *BHPS Questions*

| **Emotions.** Being able to have attachments to things and people outside ourselves; to love those who love and care for us, to grieve at their absence; in general, to love, to grieve, to experience longing, gratitude, and justified anger. Not having one's emotional development blighted by fear and anxiety. (Supporting this capability | "Have you recently....been able to concentrate on whatever you're doing?" "Have you recently....lost much sleep over worry?" "Have you recently....felt constantly under strain?" "Have you recently....been feeling unhappy or depressed?" |

Capabilities
What you are able to do and be

Nussbaum's Capability   *BHPS Questions*

| means supporting forms of human association that can be shown to be crucial in their development.) | | "Have you recently....been losing confidence in yourself?" |

| Practical Reason

Being able to form a conception of the good and to engage in critical reflection about the planning of one's life. (This entails protection for the liberty of conscience and religious observance.) | | "Have you recently...felt capable of making decisions about things?"

Have you recently....felt you couldn't overcome your difficulties?"

"Have you recently....been able to face up to problems?" |

Capabilities
What you are able to do and be

Nussbaum's Capability   *BHPS Questions*

| **Affiliation.** Being able to live with and toward others, to recognize and' show concern for other human beings, to engage in various forms of social interaction; to be able to imagine the situation **of** another protecting institutions that constitute and nourish such forms of affiliation, and also protecting the freedom of assembly and political speech.) Having the social bases of self-respect and | Have you recently....been thinking of yourself as a worthless person? "Have you recently....felt that you Were playing a useful part in things |

Capabilities
What you are able to do and be

Nussbaum's Capability   *BHPS Questions*

| **Affiliation** (contd.) |
| :--- |
| non-humiliation; being able to be treated as a dignified being whose worth is equal to that of others. This entails provisions of non-discrimination on the basis of race, sex, sexual orientation, ethnicity, caste, religion, and national origin. |

"Have you recently....been thinking of yourself as a worthless person?
"Have you recently....felt that you Were playing a useful part in things?"

Play.
Being able to laugh, to play, and to enjoy recreational activities.

"Have you recently....been feeling reasonably happy, all things considered?"

Capabilities
What you are able to do and be

Nussbaum's Capability	BHPS Questions
Play (contd.)	"Have you recently....been able to enjoy your normal day-to-day activities?"
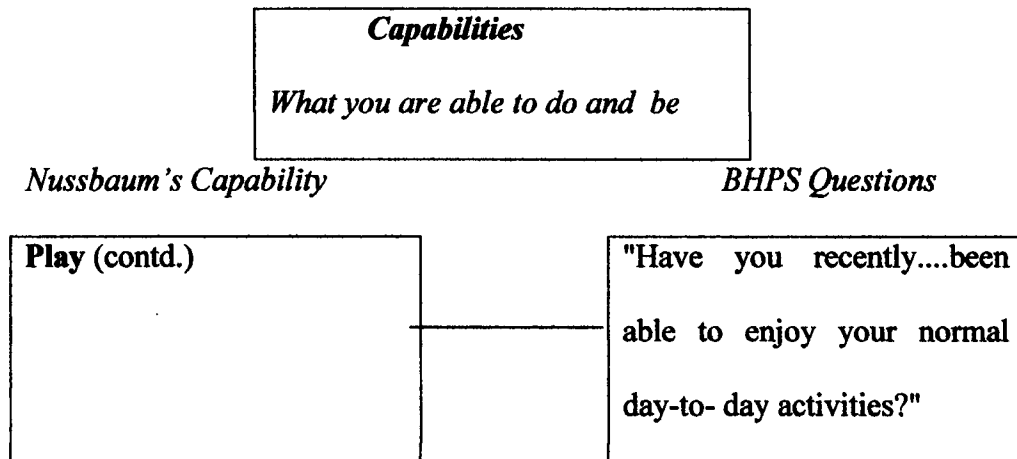
Appendix 5.2 The BHPS Personality Measures

Interviewees are asked to answer the following fifteen questions using a scale from 1 to 7 where 1 is "does not apply to me at all" and 7 means "Applies to me perfectly"

1. I see myself as someone who . . .

2. Is sometimes rude to others (reverse scored)

3. Does a thorough job

4. Is talkative

5. Worries a lot

6. Is original, comes up with new ideas

7. Has a forgiving nature

8. Tends to be lazy (reverse scored)

9. Is outgoing, sociable

10. Gets nervously easily

11. Values artistic, aesthetic experiences

12. Is considerate and kind to almost everyone

13. Does things efficiently

14. Is reserved (reverse scored)

15. Is relaxed, handles stress well (reverse scored)

16. Has an active imagination

The answer to each question is then summed to give five measures of personality; agreeableness (questions 1, 6, and 11), conscientiousness (questions 2, 7 and 12), extraversion is (questions 3, 8 and 13), neuroticism (questions 4, 9 and 14) and openness to experience (questions 5, 10 and 15)

Chapter 6 Conclusion

The main contributions of this thesis to the literature are that:

(a) it demonstrates that capabilities can be measured according to the methodological norms that commonly prevail in household surveys and

(b) it investigates capabilities in a dynamic context and provides estimates of the speed with which people adjust to dynamic shocks

(c) it finds empirical evidence that two of the important aspects of the capability approach, agency and autonomy both influence satisfaction with life.

(d) it highlights that the relative importance of capability domains in overall life satisfaction is influenced by age and gender and finally

(e) it demonstrates that individuals' capability levels adapt to shocks through both an anticipation and an adaptation effect and that the process of adaptation is different for different individuals and for different shocks.

In doing so (particularly (b) and (e)) it addresses some important criticisms of the capability approach (see e.g. Clark 2006, and Gasper 2007) and it shows that the formation of capabilities and their use in enabling individuals to lead a life they have reason to value is more dynamic than previous studies have tended to suggest.[22]

In Chapter 3, the issue of how to measure capabilities was addressed by mapping Nussbaum's list of capabilities to a readily available secondary data source the British Household Panel Survey. Evidence that a wide range of capabilities exhibit statistically significant relations to well-being was found. These relations are complex and slightly different for men and women. The concept of agency, a key aspect of the capabilities approach was incorporated in the evaluation of well-being through the use of individuals own assessment of their satisfaction with life. This ensured that the evaluation was made in terms of their own values and objectives and

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[22] At this point in time the only other body of work to have considered this dynamic process is that of Heckman and colleagues (Cunha and Heckman (2007), Heckman (2007)) which looks at child development.

whether they were able 'to help themselves and to influence the world' (Sen, 1999b).

Chapter 4 extended this examination of the relationship between capabilities and well-being using data designed specifically to include all the capabilities on Nussbaum's list. Since it concentrates on the capabilities that individuals have reason to value, this high-level list allowed, the concept of agency again to be incorporated in the analysis. What is valued in her list "is the freedom to do or not to do, (and thus) agency is woven throughout" Nussbaum (2011). Both Sen and Nussbaum argue that the capability approach recognises that autonomy is necessary to allow individuals to make informed, un-coerced decisions about the life they lead. The resultant choices enable people to live a life they have reason to value. The use of a specially designed questionnaire allowed the concept of leading 'a life they have reason to value 'to be incorporated in the analysis by asking how satisfied individuals were with their life after having considered their level of capabilities, thus providing a more reasoned view of their satisfaction with their life.

It found that the relationship between satisfaction with life and capabilities was reasonably robust even when controlling for socio-demographic and personality variables. The substantive picture obtained was one in which life-satisfaction is highly multivariate with respect to capabilities, a finding that underlines the value of the vector approach to welfare advocated by Sen. The results suggest that whilst there may be some gender and age differences, the signs on the coefficients, particularly when comparing females and males are generally the same suggesting that any gender differences in the relationship between capability and life satisfaction is primarily quantitative rather than qualitative.

The capability approach is in part a response to the problem of adaptive preferences whereby people adapt to unfavourable circumstances, which may result in any self-evaluation in terms of their satisfaction with their life being distorted. Chapter 5 addressed the issue of adaptation to life events directly and found a complicated picture where the outcome depended on the nature of the shock. Where an external shock lasts for a limited period, capabilities can return to their pre-shock level. However, in the case of becoming unemployed the results indicate that where the shock is long lasting so is the impact on the individual's overall capability level as

it is on their decision-making and enjoyment capabilities. Becoming widowed had a positive effect on men's overall capabilities but a negative effect on women's. This effect was replicated on their decision-making capability but not on their enjoyment capability, which increased for both. These findings illustrate the complex relationships involved in assessing the impact of a change on individuals' capabilities. The effect of ill-health appeared to be unambiguously negative both on overall capabilities and on their decision and enjoyment capabilities.

Chapter 5 suggests that adaptation can be a positive feature whereby individuals overcome negative events and as a result increases their capability levels and hence their well-being. This view considers adaptation to be a positive feature of an individual's life linked to their own agency, and autonomy. This contrasts with the conventional view of the capability approach, which as Comim (2005) points out tends to view adaptation as embodying a reduction in well-being. In this view, adaptation is seen as resignation, conformism, and habituation of individuals in face of adverse circumstances and as an action influenced by forces outside the individual.

This thesis has also contributed to the literature by allowing the main criticisms of the capability approach (see e.g. Clark 2006, and Gasper 2007) to contested, namely;

    i.   it is possible to identify valuable capabilities

    ii.   the high informational requirements can be met by the development of suitable questions

    iii.   interpersonal comparisons of well-being can be made by using a reflective view of an individual's satisfaction with their life

The picture, which, emerges, is that the relationship between capabilities and life satisfaction is dynamic rather than static. Chapters 3 and 4 showed that in the relationship between satisfaction with their life and an individual's capabilities the weighting for women differs from that for men, that those for the young differ from those for the old. Chapter 5 also showed that an individual's capabilities change over time and according to their life experiences. This suggests a dynamic process whereby at different times in their lives individuals choose different combinations from their basket of capabilities and apply different weightings to these chosen capabilities in order to achieve satisfaction with their life.

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These results argue that any future work on capabilities would benefit from being based on tailor made data since existing secondary data tends to focus on outcomes rather than the possibilities open to individuals and the constraints imposed either by themselves or by others[23]. In obtaining such data, expectations as to future states, experiences of past states and reasons for choices made should be sought. Whilst panel data would be ideal this thesis has shown that by including suitable controls for personality and appropriate socio-demographics some of the limitations of cross section data can be overcome.

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[23]Among work which has used the survey instrument in Chapter 4 are; Anand and Santos (2007) who found that vulnerability to future assault is significant to life satisfaction whereas past experience of violence is not, Anand, Santos and Smith (2009) who used the data to identify a 'super-poor' group and to identify the characteristics of various capability classes, Lorgelly (2009) who used a reduced version of the questionnaire to evaluate complex social and public health interventions to build sustainable neighbourhoods

Future work should be directed to indentifying the limitations to individuals increasing their capabilities; including those that they impose on themselves (e.g. not being prepared to move to seek employment). The part that unemployment plays in diminishing capabilities would be of interest as we enter a period of change in employment levels and employment sectors. The combination of capabilities deteriorating with age and the impact of ill-health on capability levels is an area which would benefit from further study as the population ages

The capability approach has had a major impact in challenging standard economic views on poverty, inequality, and human development. In the developed economies, it has lead to real changes in the treatment of the less able and to a reduction in discrimination on the grounds of sex or sexual orientation. As the pace of change in these economies increases, the challenge to those attracted by the capability approach is to investigate how the changing nature of an individual's capabilities can help them respond in such a way that they begin to or continue to lead a life they have reason to value.

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