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Wellbeing over 50: A capabilities approach

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Wellbeing Over 50: A Capabilities Approach

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Wellbeing Over 50:

A Capabilities Approach

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Abstract

Drawing on the three key relations in the capabilities approach (Sen, 1985) to welfare economics and using panel data from the English Longitudinal Survey of Aging, this paper illustrates how the capabilities approach to welfare economics can be used to understand wellbeing in older age. Specifically, we estimate models of variables related to all three aspects of a person's wellbeing: functionings, happiness and capabilities. Results indicate that the production of activities depends significantly *inter alia* on education, health and gender; that happiness depends on a wide variety of activities and that there are potentially significant gender inequalities in the constraints facing women compared with men. The paper concludes that the capabilities approach is a workable approach to empirical welfare economics, applicable to older age, and can generate a range of insights about welfare outcomes and their distribution.

Keywords: capabilities approach, happiness, functionings, constraints, heterogeneity, inequalities, older age

JEL Codes: I31

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Wellbeing Over 50:

A Capabilities Approach[1]

1. Introduction

The Beatle's song, whose refrain asks 'will you still need me, will you still feed me, when I'm 64?' raises an interesting and practical question about the nature of welfare outcomes in later life. Economists perhaps know less about this than we might, though some research has been done (for example on the u-shaped connection between life satisfaction and age) and data more relevant to older populations is increasingly being generated in national surveys. Against that backdrop, this paper seeks to contribute to the understanding of welfare outcomes in older age. Furthermore, it does so by using Sen's capabilities approach which we believe is particularly suited to understanding a phase of life where age-related changes in capacities are significant and inherent.

The paper combines a theoretical theme with a topic of growing empirical significance. In the first instance, there is growing theoretical and conceptual interest in relatively novel approaches to welfare economics. The capabilities approach, developed by Sen (1979; Sen, 1985) as a constructive response to certain foundational problems within social choice, argues for an emphasis on multi-dimensionality, a connection between functionings and happiness and the importance of freedoms to do things people have reason to value.[2] In addition, and notwithstanding that happiness is just one variable within the approach, there has been an independent move within economics to ascertain what empirical insights can be gleaned from measures of experienced utility (Kahneman and Krueger, 2006) often commonly referred to as 'happiness'. The capabilities approach and the happiness-as-an-economic-variable

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[2] The literature on the capabilities approach takes in development, social science and philosophy and is vast. Economists have tended to be interested either in theory - particularly social choice and consumer theory - or in empirical work engaging with social policy, development, health, childhood and parenting, entrepreneurship and issues in the measurement of economic wellbeing and progress. (For a selection of such work see Anand *et al.*, 2011a; Anand *et al.*, 2011b; Basu, 1987; Brandolini and D'Alessio, 1998; Burchardt and Le Grand, 2002; Chiappero, 2000; Comim *et al.*, 2008; Cunha and Heckman, 2010; Cunha *et al.*, 2010; Desai and Shah, 1988; Fleurbaey, 2006; Fleurbaey, 2009; Gaertner *et al.*, 1992; Herrero, 1996; Kingdon and Knight, 2006; Klasen, 2000; Krishnakumar, 2007; Pattanaik and Xu, 2007; Qizilbash, 1997; Ramos and Silber, 2005; Schokkaert, 2007; Schokkaert and Van Ootegem, 1990; Volkert, 2006; Volkert and Schneider, 2011).

traditions have different foundational motivations and stress distinct methodological concerns but are, in many places, more compatible than the literature sometimes recognises. Moreover, and key for our purposes, they share an interest in developing direct measures of the welfare outcomes that economic processes are ultimately intended to promote. These scientific concerns are both reflected in, and being driven by the international development of broad measures of progress that integrate economic and social variables such as the UN's Human Development Index (Anand and Sen, 1994), and the OECD's Better Life Compendium (OECD, 2011).

A second set of motivating interests derives from the simple but important demographic fact that around the world populations are tending to live longer. The growing interest and economic literature in the economics of aging deals, as might be expected, with policy issues such as pensions, health changes, and labour force participation but focuses much less on the actual welfare outcomes produced in older age. How in our later years, we make happiness, the constraints we face, and how we use different kinds of resources, are significant scientific questions in their own right, but answers to such questions may also have valuable practical or policy consequences.

The capabilities approach, when used in economics to date, has tended to be applied to working age adults and children and yet we believe that potentially, it provides a good fit for understanding quality of life in older age where physical and cognitive changes have profound impacts on the conduct of economic and social activities. If this turns out to be the case, the capabilities approach could promise the possibility of an approach to welfare-economics that was particularly suited to analysing changes over the entire life-course.

In this paper, therefore, we seek to both extend the reach of the capabilities approach as a working approach to welfare economics, and shed some empirical light on happiness and other quality of life issues in older age. For the purposes of this exercise, we draw on data from the English Longitudinal Survey of Aging (ELSA) which has variables relating to the three relations that we wish to explore.

In the first instance, we combine data on happiness and 11 functionings from three waves of the ELSA dataset to explore evidence concerning the drivers of happiness in older age. Using a panel probit specification allowing for persistence, we find, *inter alia*, that a range of different functionings have a detectable connection with happiness and that being a member of a social club and eating out about once a month or more often are most consistently associated with happiness.

We then examine the production of these functionings themselves. Our main analysis finds that educational status and gender appear to be significant determinants in most if not all cases. Furthermore, health conditions are relevant in some cases. Finally, we use data on whether respondents wish to engage in activities more often as indicators of constraint (lack of capability) and find evidence of connections with gender, education, wealth and age. Taken together with data on the actual involvement in these activities, we suggest that this points to a potentially significant source of gender inequality. In focussing on these three relations and applying them to quality of life in older age, we follow and extend the operationalization of Sen's capabilities approach developed by Anand et al (2009a; 2009b; 2006) and conclude that the approach may indeed provide a useful way of investigating happiness and other aspects of quality of life across the age range.

The rest of this paper is organised as follows. Section 2 describes the capabilities approach to welfare economics and our application of its main ideas to understanding quality of life in older age. Section 3 then goes on to introduce the empirical strategy and discusses issues concerning data and models. Section 4 presents the main results dealing with our happiness equations, production functions for 'doings and beings' and the covariates of activity constraints, in turn. The fifth and final section provides additional discussion and concluding remarks.

2. The Capabilities Approach, Welfare Economics and Aging

The capabilities approach started life as a constructive response to some deep foundational problems in social choice and welfare (Sen, 1979) and a particularly useful discussion for economic analyses can be found in Sen (1985). The framework developed there identifies three variables key to the assessment of wellbeing and discusses their conceptual connections with the aid of two behavioural equations and an identity. In this section, we provide a brief overview of the theoretical relations at the heart of the approach and indicate some ways in which they might help develop insights into the quality of life (welfare outcomes) of older people.

A basic building block of the approach is the concept of functionings which are typically defined as 'doings or beings'. Functionings might for example range from activities such as attending a football match or reading a novel, through to aspects of socio-demographic status such as being married or a parent. So at any one point in time, the *i*th individual could be

described as having a vector of functionings in a j-dimensional space thus: $\mathbf{f}_i$. Functioning vectors are produced by individuals from the resources, r, with which they are endowed, and additionally, the approach emphasises the fact that there is significant heterogeneity in the way people convert resources into functionings. Typically these points are summarised by describing doings and beings as a vector function of resources related to characteristics of the individual thus: $\mathbf{f}_i = f_i(\mathbf{r}_i)$. As an approach to welfare economics it views financial resources as an input into the production of welfare outcomes and recognises that the resources on which people draw may be non-financial. This relationship is used by capabilities researchers to highlight the fact that people are heterogeneous in their abilities to convert resources into the functionings they seek out and the idea has been applied to good effect in an econometric analysis of disability by Kuklys (2005). In older age, the connection between functionings and resources changes significantly as people age and this provides a motivation for asking whether the capabilities approach can help the study of welfare outcomes in older age.

A second core idea in the theoretical setup is the view that utility u(.), or happiness, depends on a person's functionings ie $u_i = u_i(\mathbf{f}_i)$. Happiness might depend on other things too, and some aspects of a person's being might plausibly not be reflected in their measured happiness, but as a first order approximation this happiness equation makes an important point. Happiness can be estimated as a function of income but it may also be estimated as function of the activities that a person undertakes or some of the states that they find themselves in. Both forms of analysis can be useful, though in the latter case, results will vary between studies depending on the way in which dimensions are conceptualised and measured. A widely cited study by van Praag *et al.,* (2003) (using data from the German Socio-Economic Panel Survey) finds that that experienced utility can be decomposed into satisfaction with job, financial situation, housing, health, leisure and the environment. In a similar vein but drawing on their own primary data designed to operationalize aspects of the capabilities approach, Anand *et al.,* (2009a) find evidence of connections between experienced utility and, for example, adequacy of housing, family relations, domestic violence, autonomy and usefulness, racial discrimination and the ability to use skills and talents at work. Taken together these papers provide support for a multi-dimensional concept of quality of life but also highlight the fact that results may vary significantly depending on the variables to hand and/or the conception of quality of life being used.

The most distinctive aspect of the capabilities approach is to be found in a third and final relationship based on the observation that what a person is free to do is also of importance when evaluating overall position. The idea that freedom is of value to individuals is

widespread in economics but Sen offers a relatively novel formulation in which a person's capabilities are defined as a set Q of all the things that person could do or be, given the resources with which they are endowed. For any individual with a finite endowment, this definition might be written thus: $Q_i = \{f_{i,1}, \ldots, f_{i,m}\}$. Typically a person's capabilities, represented by this set, cannot be directly or completely observed, but one strategy for estimation derives from the multi-dimensional nature of the elements of Q. The idea is simply that any particular capability set can be viewed as defining a maximum level of functioning on each dimension. The set of such maxima define a perimeter estimate of Q which can be used to assess a person's capabilities. With obvious notation we can therefore define a capability set perimeter (no bigger than the previous set) as $Q_i = \{d_i 1_{max}, \ldots, d_i f_{max}\}$. The dataset we analyse contains responses to questions about the extent to which people would like to engage more frequently in an activity than is currently the case. 'Would-like-to-do-more' is a novel, not yet much used variable in the economics literature on wellbeing and responses to such questions can be taken as negative indicators of the elements of the capability perimeter. For this reason, we use those responses to provide some insight into aspects of a person's capability.

Whilst the main objective is to employ the capabilities approach as a framework for identifying three aspects of welfare outcomes, it is possible to make some general remarks about the kinds of empirical results that might be expected. In our happiness equations we expect to find evidence that quality of life depends on a range of doings and beings distributed across very different dimensions. If people only responded to life satisfaction questions based on an internally fixed measure of happiness and adapted to shocks instantaneously and completely we would not expect to observe any relationship between happiness and functionings. However, these conditions are typically not satisfied as recent work on the adaptation of happiness to shocks shows, so we should expect to observe relations of the kind just discussed. Beyond this and more specifically, there is some work in health and gerontology (Gabriel and Bowling, 2004) which suggests that social activities are particularly important for quality of life in older age whilst recent work on relational goods by Becchetti *et al*., (2008) provides a general case for the inclusion of social activities in the understanding of happiness. These considerations lead us to hypothesize that activities with a social component should emerge as significant determinants of happiness.

In our analysis of production functions for doings and beings, we shall be particularly interested in the impact of both financial and non-financial resources. We expect to find evidence that wealth is associated with the production of functionings, both in terms of

frequency and quality, but also evidence concerning impacts of health and education, which we view as significant resources, as well as gender and age. We expect that the production functions will vary across the activities though it is difficult to predict in advance what the production functions might look like.

Finally, we shall report a rather similar analysis of the way in which constraints are produced. Given that the freedom aspect of the capabilities approach has encouraged and engaged with work on equality of opportunity (e.g.Bourguignon *et al.*, 2003; Peragine, 2004), we might hypothesise that there will be evidence of inequalities in our data. This will turn out to be difficult to assess for inequalities due to ethnic groups due to limited variation in this variable in our data, and so our main focus will be on evidence of possible inequalities due to gender. There is perhaps less empirical work directly relevant to the analysis that we conduct here although Hamermesh (2003) provides an overview of work relating to time-use and constraints from which he makes the case that standard measures of inequality underestimate total economic inequality. Arguably, and in addition, his findings that 'educated people engage in less routine behaviour' might be taken to support the hypothesis that education can help people overcome activity constraints and promote social inclusion.

In short, there are both theoretical and empirical reasons to think that the capabilities approach might fruitfully be used as a framework for examining possible determinants of happiness, functionings and constraints as they relate to quality of life in older age. In the section that follows, we describe the variables selected to operationalize these aspects of the approach before going on to describe the rationale for the econometric models used.

3. Empirical Analysis: Data and Models

3.1 Data

We employ variables from the English Longitudinal Study of Ageing (ELSA) as it has data on all three aspects of quality of life (happiness, functionings and constrained activities). As functionings are defined as doings and beings, we use data on the frequency of some 11 daily activities from a self-complete module to capture aspects of doings and beings. The variables used are summarised in Table 1. In general, these activities are measured either as binary or categorical variables.

To measure functionings we use data on both doings and beings. The latter are measured by responses on questions about marital status, age when education was completed and whether

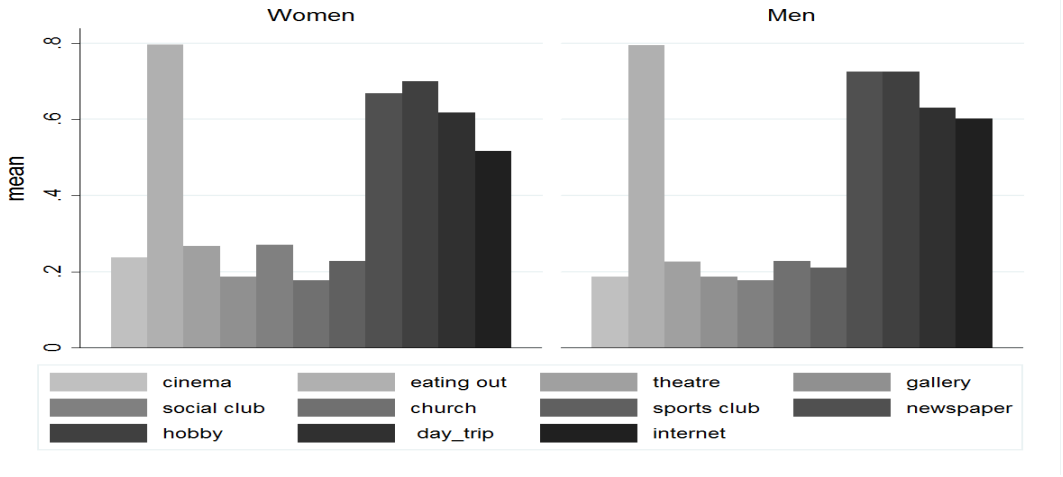
or not the respondent is a grandparent. We also employ a number of variables related to doings which comprise binary indicators relating to membership of a sports club, social club, church, reading a daily newspaper, having a hobby, going on a day trip in the last 12 months

Table 1: Variable means by wave: balanced panel

	2004/05	2006/07	2008/09
Doings:			
Go to the cinema-never	0.356	0.369	0.374
Go to the cinema- once/twice a year or less	0.416	0.425	0.416
Go to the cinema - every few months	0.153	0.140	0.144
Go to the cinema - about once a month or more	0.075	0.066	0.067
Eating out- never	0.056	0.055	0.064
Eating out- once/twice a year or less	0.153	0.138	0.147
Eating out- every few months	0.237	0.225	0.225
Eating out- about once a month or more	0.554	0.582	0.564
Go to the art gallery/museum – never	0.344	0.337	0.379
Go to the art gallery/museum - once/twice a year or less	0.473	0.462	0.446
Go to the art gallery/museum - every few months	0.132	0.143	0.133
Go to the art gallery/museum - about once a month or more	0.051	0.058	0.042
Go to the theatre- never	0.291	0.279	0.304
Go to the theatre- once/twice a year or less	0.456	0.462	0.460
Go to the theatre - every few months	0.181	0.180	0.172
Go to the theatre - about once a month or more	0.072	0.078	0.064
Member of church	0.231	0.225	0.231
Member of social club	0.204	0.197	0.196
Member of sports club	0.225	0.216	0.220
Daily newspaper	0.664	0.670	0.748
Hobby	0.755	0.803	0.572
Day trip in the last 12 months	0.681	0.696	0.489
Use internet/email	0.425	0.453	0.791
Beings:			
Single	0.051	0.053	0.049
Married	0.679	0.667	0.656
Divorced	0.111	0.106	0.106
Widowed	0.159	0.174	0.189
Age finished education	16.223	16.223	16.223
Is a grandparent	0.644	0.681	0.710
Resources:			
No cardiovascular condition	0.499	0.336	0.319
No chronic health condition	0.444	0.460	0.422
Has good eyesight	0.880	0.859	0.863
Age	64.839	66.657	68.740
Net financial wealth (log)	11.698	11.726	11.739
Constraints:			
Cinema more	0.304	0.30	0.274
Eating out more	0.411	0.422	0.395
Gallery more	0.297	0.317	0.265
Theatre more	0.458	0.483	0.428

and using the internet or email (see Figure 1). We also make use of four categorical variables relating to the frequency of involvement in eating out, going to the cinema, visiting the theatre and visiting a gallery or museum.

Figure 1: Functionings (activities) by gender

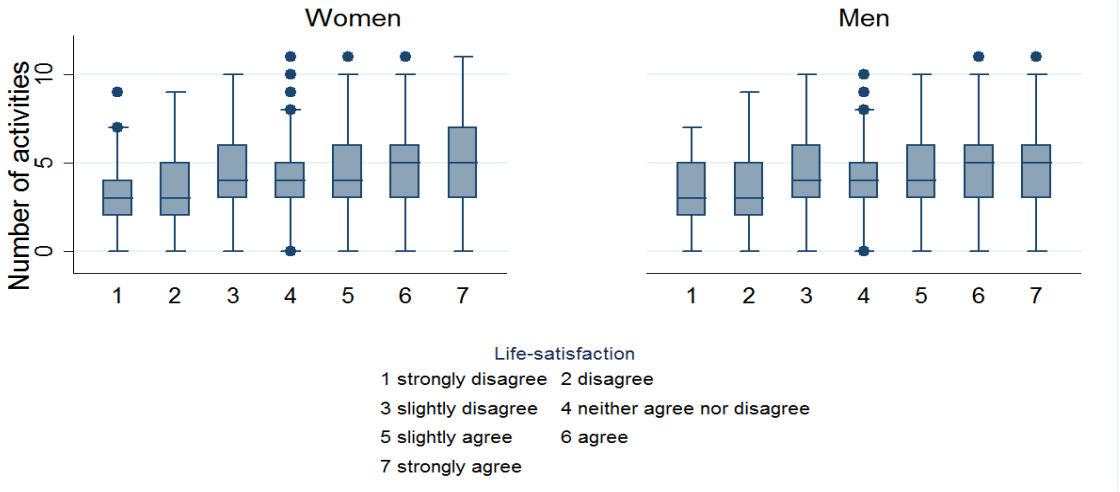


Cinema, eating out, theatre and gallery based on cut-offs of participating in these activities 'every few months' or 'once a month or more'.

To measure happiness, we use responses to a question about life satisfaction: 'Please say how much you agree or disagree with the following statement: I am satisfied with my life: strongly agree /agree/slightly agree/neither agree nor disagree/disagree/strongly disagree'. This measure of satisfaction (see Figure 2) is now widely used in economics and has been shown to be a robust measure of a person's well-being (Dolan and White, 2007) with positive correlations with other more objective measures of personal well-being.[3].

[3] There is in fact a significant literature on happiness more often correctly referred to as life satisfaction that continues to flourish. (See for instance, Clark and Oswald, 1994; Clark and Senik, 2011; Daly and Wilson, 2009; Deaton, 2012; Ferrer-i-Carbonell and van den Bergh, 2007; Frey and Stutzer, 2002; Kahneman *et al.*, 1997; Layard, 2011; Metcalfe *et al.*, 2011; Winkelmann and Winkelmann, 1998)

Figure 2: Life satisfaction by functionings (activities)



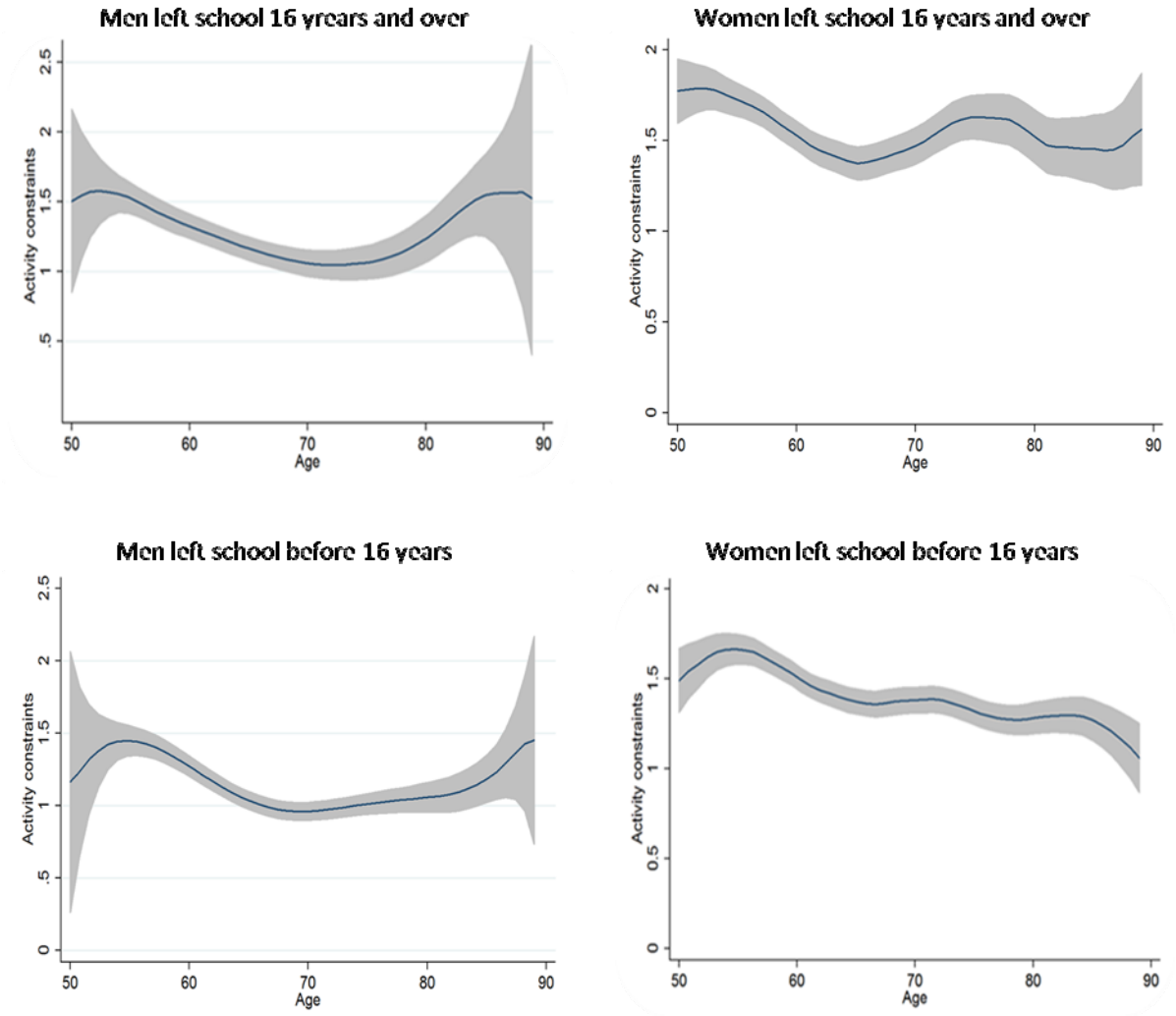
Activities include ordered variables frequency of eating out, cinema, gallery and theatre. The total is based on cut-offs of participating in these activities 'every few months' or 'once a month or more'.

In our last set of equations we study four sets of constraints (frequency of eating out/going to the theatre/going to the cinema/going to the art gallery/museum) measured by the question: 'Would you like to engage in [activity] more often: Yes/No' and analyse the determinants of these constrained activities (see Figure 3).

The variables used are drawn from ELSA which is a bi-annual survey designed to study ageing in England and comprised at the time of writing four waves covering the period 2002-2009. The survey draws its sample from the Health Survey of England and recruits participants to provide a representative sample of the English population aged 50 and over. In the analysis that follows, we rely on waves 2 to 4 as our focus is on life-satisfaction, activities and constraints and these questions were not included in wave 1. Throughout, we use a balanced sample of 18,387 observations - 6,129 individuals over 3 waves, aged 50 and over as of wave 2.

As Pudney (2008) argues, allowance should be made for state-dependence in happiness, we check whether there is a dynamic process involved in happiness, i.e. if u changes in response to changing circumstances. Persistence in u could result from previous measures of happiness having an impact on current reports of u along with current objective variables. In situations of state dependence a static model of perfect adjustment is unlikely to give accurate results. One way of checking for (unconditional) state dependence is through transition matrices presented in Table 2. Here the rows represent previous levels of happiness and the

Figure 3: Activity Constraints by Age and Education - Local Polynomial Regression[4]



[4] Over time, the pattern of activity constraints for women with low education appears significantly different to those for other groups.

columns indicate current levels. Persistence is visible from the high probabilities in the diagonals and in the cells close to them.

Table 2: Life Satisfaction Transition matrices

(a) Men

Life satisfaction	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	*N*
Strongly disagree	0.390	0.195	0.024	0.049	0.146	0.171	0.024	41
Disagree	0.111	0.287	0.199	0.129	0.088	0.175	0.012	171
Slightly disagree	0.021	0.188	0.217	0.129	0.246	0.192	0.008	240
Neither agree nor disagree	0.031	0.096	0.137	0.257	0.216	0.233	0.031	292
Slightly agree	0.012	0.034	0.101	0.126	0.302	0.412	0.014	587
Agree	0.001	0.007	0.031	0.045	0.133	0.674	0.109	2,360
Strongly agree	0.006	0.003	0.012	0.022	0.045	0.491	0.422	688
N	63	169	267	325	664	2,321	570	4,379

(b) Women

Life satisfaction	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	*N*
Strongly disagree	0.353	0.294	0.071	0.118	0.071	0.094	0.000	85
Disagree	0.088	0.353	0.181	0.139	0.151	0.076	0.013	238
Slightly disagree	0.031	0.151	0.225	0.182	0.208	0.182	0.020	351
Neither agree nor disagree	0.020	0.079	0.160	0.229	0.270	0.219	0.023	393
Slightly agree	0.017	0.046	0.094	0.140	0.345	0.328	0.029	890
Agree	0.004	0.011	0.031	0.040	0.142	0.667	0.106	2,873
Strongly agree	0.006	0.014	0.014	0.017	0.044	0.501	0.405	805
N	102	277	374	450	972	2,786	674	5,635

The rows indicate the probability of reporting a specific level of LS at time t while the columns represent t-1

3.2 Models and Specifications

Our analysis examines aspects of all three components of welfare outcomes identified by the capabilities approach. We model happiness (u^h) as a function of doings and beings using a suite of ordered probit models which in their most general provide some indication of robustness by allowing for unobserved heterogeneity. Ferrer-i-Carbonell and Frijters (2004), for example, discuss a number of methodological issues relating to the analysis of life satisfaction and specifically identify the influence of unobservables on reported life satisfaction. Not accounting for unobserved heterogeneity could, for example, result in 'personality bias' whereby extroverts are likely to be happier and in turn have greater labour market productivity. The other issue we seek to address is the observed state dependence

observed in happiness and this we do by modelling u^h using a dynamic panel specification. This model includes previous measures of life-satisfaction allowing for state dependence which we treat as ordinal for estimational purposes. The underlying latent variable specification common to discrete choice models can be written in this case as:

$$u^h_{it} = \beta' f_{it} + \gamma' u^h_{it-1} + \alpha_i + \varepsilon_{it} \quad (i = 1 \ldots N, \quad t = 2 \ldots T_i) \qquad (1)$$

where f_{it} is the set of observed variables, u^h_{t-1} is vector of life-satisfaction reports from the previous wave, α_i is an individual-specific time invariant component and ε_{it} is a time and individual-specific error term. The β s and γ s are parameters to be estimated. The probability of reporting a particular category of u^h_{t-1} can be written as:

$$P(u^h_{it} = j) = \Phi(\mu_j - \beta' f_{it} - \gamma' u^h_{it-1} - \alpha_i) - \Phi(\mu_{j-1} - \beta' f_{it} - \gamma' u^h_{it-1} - \alpha_i) \qquad (2)$$

The usual approach to dealing with individual specific effects is to apply a fixed effects specification. Powdthavee (2010) uses this approach along with a cardinal measure of life satisfaction to estimate the causal effects of income on happiness. However, in our ordinal measure of life satisfaction the use of fixed effects yields inconsistent estimates (Maddala, 1986). To allow for the possibility that the individual effect and the observed covariates may be correlated we parameterize the individual effect (Chamberlain, 1984; Mundlak, 1978). A further complication arises in dynamic models with regard to initial conditions, which refers to the assumption that the initial observations are the true initial values of the dynamic process. This does not hold in our case. To deal with the initial conditions problem we follow the process suggested in Wooldridge (2005) for non-linear dynamic models and condition the distribution of the individual effect on the initial value and the explanatory variables. This approach is applied in Contoyannis *et al.*, (2004) in the case of self-assessed health and results in a random effects structure with covariates that also include initial values of *u* (u^h_{i1}) and the means of the time varying regressors ($\overline{x}_i$).

To estimate our next two sets of models on functionings and constraints we use a static correlated random effects model, similar in specification to equation (2) but not including the lag of the dependent variable. Of the eleven activities and four constraints we study, four are ordered responses and the remainder are binary; we use ordered and binary probit specifications respectively.

We base our estimation specifications on the underlying theoretical implications of the capabilities approach detailed in Section 2. In our first set of models on happiness we begin

with a specification that directly interprets the capabilities approach, and study the functionings (activity) determinants of happiness. In this model we include all available doings and beings of individuals. We first estimate a random effects model with the assumption of no correlation between the individual-specific effect and the regressors. We then estimate a dynamic model allowing for correlated effects as per equation (2). Our main specification for happiness follows from these and includes resources an individual may possess, along with their doings and beings. The resources include age, health status and net financial wealth. We estimate each of these models separately for men and women.

Following the underlying idea in the capabilities approach that functionings depend on resources, we then estimate a series of activity production functions for each of the eleven functionings in Table 1. The models are estimated as a function of resources (health, net financial wealth, age), gender and marital status. In addition, for our models on constraints we condition the desire to participate more in an activity on current levels of participation i.e. we include it as a regressor along with the resources an individual possesses.

4. Results

The results for the various models outlined in the previous section are reported here. In the case of happiness, results for men and women are reported separately. We highlight and discuss some key aspects of the findings dealing in order with happiness, the production of functionings, and potential determinants of constrained activities.

4.1 Happiness: Estimates of dynamic ordered probits

Table 3 and Table 4 present the results for our models on happiness which include the three specifications of random effects ordered probits described earlier (including doings, beings and activities). Column (1) presents our base specification of a static model of happiness. Column (2) and (3) allow for state dependence by including one-period lags of the dependent variable *u*. Iin addition, we parameterize the unobserved individual effect by including the average of the time-varying regressors and a vector of first-period dummies of the dependent variable[5]. In all three random effects specifications unobserved heterogeneity accounts for a

[5] We test for any attrition related bias in our happiness equations using specification 1 through a simple variable addition test (Verbeek and Nijman, 1992). Two test variables are used – an indicator of whether an individual responds in all waves ie., the individual is in the balanced panel (allwav) and an indicator of a count of the number of waves and individual is in (numwav). Each of these is added to the model and estimated with the unbalanced sample giving two separate tests for attrition. The tests are estimated separately for men and women. For men: test numwav=0 - p-value0.07; test allwav=0 –

large portion of the error variance as reported by the interclass correlation coefficient. In our main specification (column (3)) it accounts for approximately 29% for men and 22% for women. The dynamic specifications in columns (2) and (3) allow testing for state dependence. In the case of men there is no clear gradient across the estimated effects of the lag of happiness, but in the case of women, a clear gradient exists moving from lower states of happiness to higher states with statistically significant coefficients.

Focussing on our main specification, for men going to the cinema, being married, going on day trips, and using email/internet are statistically significant and positively associated with greater happiness. After controlling for mean net financial wealth, current net financial wealth (column 3) is statistically significant and positively associated with higher levels of reported life-satisfaction, indicating that for men short term economic status is also a key determinant of happiness. In the results for women eating out, membership of a social club and net financial wealth improve happiness. For both men and women age at which education was completed is negatively associated with greater happiness.

To provide an indication of quantitative results on the association between happiness and the covariates, average partial effects (APE) are presented in Table A.1 in the appendix. In the ordered probit model APEs can be calculated for each of the reported categories of happiness. In Table A.1 the probability of reporting the best category of happiness is provided for selected regressors along with sample standard deviations. For both men and women APE of current net financial wealth is larger than mean net financial wealth. One way of regarding the latter is as a more permanent measure of financial status while current financial wealth represents a transitory measure (Frijters *et al.*, 2005). The APE of current net financial wealth is much larger for men than women. The APEs for men also show larger magnitudes for not having a cardiovascular or chronic health condition as compared to women. The magnitudes of state dependence are smaller for men in most categories.

One finding that begins to stand out as not obviously confirming prior expectations concerns evidence about being a grandparent. For both men and women being a grandparent is associated with lower levels of happiness, with a much larger magnitude for women than men. Compared with a number of other functionings considered, being a grandparent is one over which a person has limited control – and furthermore, any caring activities that might be

p-value 0.06. For women: test numwav=0 p-value 0.39 ; test allwav=0 – p-value 0.87 suggesting that at least qualitatively our results are likely to be relatively robust.

associated with the status are most likely to fall on female grandparents. At the very least, these results suggest that more work on the situations in which grand-parenting does, or does not, contribute beneficially to happiness are warranted.

Table 3: Happiness - Men: Random effects ordered probit models.

VARIABLES	(1) Doings and Beings	(2) Doings and Beings	(3) Doings, Beings and Resources
Eating out- once/twice a year or less*	-0.0290	-0.1852	-0.1795
	(0.107)	(0.176)	(0.173)
Eating out- every few months*	0.0377	-0.0581	-0.0402
	(0.109)	(0.188)	(0.185)
Eating out- about once a month or more*	0.2327**	0.0964	0.1120
	(0.108)	(0.192)	(0.189)
Go to the cinema- once/twice a year or less*	0.0891	0.3435***	0.3059***
	(0.060)	(0.106)	(0.105)
Go to the cinema - every few months*	0.0305	0.3849**	0.3576**
	(0.085)	(0.157)	(0.154)
Go to the cinema - about once a month or more*	0.1292	0.4457**	0.4103*
	(0.116)	(0.214)	(0.211)
Go to the art gallery/museum once/twice a year or less*	0.0386	-0.0069	0.0039
	(0.059)	(0.099)	(0.097)
Go to the art gallery/museum - every few months*	0.0745	-0.0715	-0.0728
	(0.084)	(0.142)	(0.140)
Go to the art gallery/museum - about once a month or more*	0.0754	-0.1384	-0.1340
	(0.127)	(0.225)	(0.221)
Go to the theatre- once/twice a year or less*	0.0381	0.0222	0.0187
	(0.061)	(0.098)	(0.097)
Go to the theatre - every few months*	0.1849**	0.0036	0.0028
	(0.085)	(0.139)	(0.138)
Go to the theatre - about once a month or more*	0.1635	-0.0851	-0.0848
	(0.119)	(0.211)	(0.208)
Member of sports club	0.0813	0.0481	0.0633
	(0.059)	(0.107)	(0.105)
Member of social club	0.0763	0.0967	0.0885
	(0.057)	(0.101)	(0.099)
Member of church	0.2241***	0.1506	0.2134
	(0.073)	(0.191)	(0.188)
Daily newspaper	0.1104**	0.0661	0.0555
	(0.045)	(0.063)	(0.064)
Hobby	0.1629***	0.0276	0.0990
	(0.047)	(0.066)	(0.067)
Day trip in the last 12 months	0.0242	0.1794***	0.1931***
	(0.046)	(0.069)	(0.068)
Use internet/email	-0.0533	0.2738***	0.1702**
	(0.048)	(0.075)	(0.079)
Married	0.5278***	1.0689***	0.8349**
	(0.134)	(0.404)	(0.405)
Divorced	-0.0940	0.6561	0.4871
	(0.159)	(0.450)	(0.447)
Widowed	0.1907	0.5719	0.2884
	(0.161)	(0.483)	(0.481)

Age finished education	-0.0179	-0.0175	-0.0164
	(0.013)	(0.011)	(0.011)
Is a grandparent	0.1091*	-0.0412	-0.0832
	(0.062)	(0.189)	(0.188)
No cardiovascular condition	0.2038***	0.1145	0.1323
	(0.050)	(0.115)	(0.112)
No chronic health condition	0.2279***	0.1230	0.1375
	(0.051)	(0.117)	(0.115)
Has good eyesight	0.2285***	0.0179	0.0093
	(0.069)	(0.106)	(0.104)
Age			-0.1474
			(0.158)
Age2			0.0017
			(0.001)
Net financial wealth (log)			0.2146**
			(0.084)
Lag Happiness (strongly disagree)		0.1442	0.0176
		(0.333)	(0.330)
Lag Happiness (disagree)		-0.0873	-0.1078
		(0.172)	(0.170)
Lag Happiness (slightly disagree)		0.0329	0.0168
		(0.136)	(0.135)
Lag Happiness (slightly agree)		0.1622	0.2152*
		(0.118)	(0.116)
Lag Happiness (agree)		0.4977***	0.6101***
		(0.132)	(0.132)
Lag Happiness (strongly agree)		0.7744***	0.9832***
		(0.190)	(0.194)
Mean of time-varying regressors	No	Yes	Yes
First wave happiness values		Yes	Yes
Rho (intraclass correlation coefficient)	0.6006***	0.3420***	0.2889***
	(0.014)	(0.058)	(0.064)
Observations	5,617	3,428	3,428

Column (1): Random effects ordered probit; Columns (2) and (3): Dynamic Random effects ordered probit with Mundlak specification.
*Base reference category –'Never'. [a] Percentage of unobserved variation explained by individual effect.
Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table 4: Happiness- women: Random effects ordered probit models

VARIABLES	(1) Doings and Beings	(2) Doings and Beings	(3) Doings, Beings and Resources
Eating out- once/twice a year or less*	-0.1228	0.0013	0.0150
	(0.098)	(0.157)	(0.156)
Eating out- every few months*	0.0804	0.1448	0.1704
	(0.101)	(0.168)	(0.167)
Eating out- about once a month or more*	0.2622***	0.3004*	0.3266*
	(0.101)	(0.172)	(0.171)
Go to the cinema- once/twice a year or less*	-0.0567	-0.0247	-0.0185
	(0.055)	(0.095)	(0.094)
Go to the cinema - every few months*	0.0057	0.1215	0.1190
	(0.073)	(0.129)	(0.127)
Go to the cinema - about once a month or more*	0.0197	0.1668	0.1461
	(0.096)	(0.167)	(0.165)
Go to the art gallery/museum once/twice a year or less*	0.1418***	0.0363	0.0559
	(0.054)	(0.090)	(0.089)
Go to the art gallery/museum - every few months*	0.2285***	0.0854	0.1048
	(0.079)	(0.131)	(0.129)
Go to the art gallery/museum - about once a month or more*	0.2216*	-0.0531	-0.0128
	(0.114)	(0.197)	(0.195)
Go to the theatre- once/twice a year or less*	0.0237	-0.0896	-0.0714
	(0.060)	(0.099)	(0.098)
Go to the theatre - every few months*	0.1234	0.0430	0.0490
	(0.077)	(0.129)	(0.128)
Go to the theatre - about once a month or more*	0.0048	-0.3020*	-0.2683
	(0.105)	(0.176)	(0.175)
Member of sports club	0.1176**	0.0680	0.0779
	(0.050)	(0.085)	(0.084)
Member of social club	0.1483***	0.2105**	0.2013**
	(0.054)	(0.087)	(0.086)
Member of church	0.2431***	-0.1122	-0.1170
	(0.057)	(0.140)	(0.138)
Daily newspaper	0.0390	0.0463	0.0088
	(0.040)	(0.054)	(0.055)
Hobby	0.1310***	0.0166	0.0934
	(0.041)	(0.057)	(0.058)
Day trip in the last 12 months	-0.0006	-0.1069*	-0.0622
	(0.040)	(0.059)	(0.060)
Use internet/email	-0.1347***	0.0197	-0.1242*
	(0.040)	(0.061)	(0.067)

Married	0.6384***	0.3189	0.1434
	(0.133)	(0.711)	(0.705)
Divorced	-0.1648	0.0495	-0.1240
	(0.147)	(0.715)	(0.709)
Widowed	0.1471	-0.6111	-0.8317
	(0.142)	(0.727)	(0.721)
Age finished education	-0.0010	-0.0039	-0.0105
	(0.014)	(0.011)	(0.011)
Is a grandparent	-0.0143	-0.2259	-0.3181*
	(0.058)	(0.168)	(0.169)
No cardiovascular condition	0.1570***	0.0474	0.0474
	(0.045)	(0.095)	(0.094)
No chronic health condition	0.3134***	0.0224	0.0956
	(0.049)	(0.107)	(0.107)
Has good eyesight	0.1908***	0.0782	0.0867
	(0.059)	(0.089)	(0.088)
Age			0.1258
			(0.136)
Age2			-0.0001
			(0.001)
Net financial wealth (log)			0.1233*
			(0.073)
Lag Happiness (strongly disagree)		-0.5005**	-0.5551**
		(0.242)	(0.239)
Lag Happiness (disagree)		-0.3068**	-0.3580**
		(0.143)	(0.141)
Lag Happiness (slightly disagree)		-0.1652	-0.1612
		(0.112)	(0.111)
Lag Happiness (slightly agree)		0.1778*	0.2224**
		(0.097)	(0.096)
Lag Happiness (agree)		0.5992***	0.6822***
		(0.115)	(0.113)
Lag Happiness (strongly agree)		0.8188***	0.9720***
		(0.169)	(0.168)
Mean of time-varying regressors	No	Yes	Yes
First wave happiness values		Yes	Yes
Rho (intraclass correlation coefficient)[a]	0.6064***	0.2505***	0.2150***
	(0.013)	(0.057)	(0.059)
Observations	6,914	4,171	4,171

Column (1): Random effects ordered probit; Columns (2) and (3): Dynamic Random effects ordered probit with Mundlak specification.
*Base reference category –'Never'. [a] Percentage of unobserved variation explained by individual effect.
Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table 5: Activity Production Functions

VARIABLES	(1) Eating out	(2) Cinema	(3) Gallery	(4) Theatre	(5) Sports club	(6) Social club	(7) Church	(8) Newspaper	(9) Hobby	(10) Day trip	(11) Internet
No	-0.0875*	0.0869*	0.0492	-0.0310	-0.1987**	-0.0770	-0.0797	-0.0213	-0.1642***	-0.0678	0.1741***
cardiovascular condition	(0.051)	(0.052)	(0.052)	(0.050)	(0.078)	(0.077)	(0.120)	(0.054)	(0.055)	(0.053)	(0.066)
No chronic	0.0080	0.0863	0.1446**	-0.0063	0.0785	0.0374	0.2140	-0.0220	0.1496**	0.1162*	-0.0005
health condition	(0.059)	(0.060)	(0.060)	(0.058)	(0.090)	(0.090)	(0.141)	(0.063)	(0.063)	(0.062)	(0.076)
Has good	0.0614	0.1330**	-0.0518	0.0428	-0.1738*	0.0636	-0.1476	-0.0245	0.0042	-0.1097*	0.0828
eyesight	(0.053)	(0.063)	(0.063)	(0.060)	(0.097)	(0.085)	(0.136)	(0.057)	(0.056)	(0.057)	(0.070)
Net financial	0.0605	0.0085	-0.0000	0.0527	-0.0490	0.0654	-0.1640	-0.0288	-0.0721	0.0276	-0.1007
wealth (log)	(0.048)	(0.045)	(0.045)	(0.044)	(0.069)	(0.074)	(0.106)	(0.050)	(0.052)	(0.050)	(0.063)
Gender	-0.1562***	-0.4595***	-0.1529**	-0.5567***	-0.2887***	0.4270***	-1.0526***	0.1018***	0.0127	-0.0320	0.3133***
(male=1)	(0.056)	(0.066)	(0.060)	(0.060)	(0.079)	(0.072)	(0.113)	(0.037)	(0.034)	(0.033)	(0.050)
Age	0.1497***	0.0200	0.2212***	0.2979***	0.1262	0.1147	0.0855	0.7202***	0.0004	0.8742***	-0.0163
	(0.056)	(0.061)	(0.060)	(0.057)	(0.093)	(0.088)	(0.134)	(0.060)	(0.060)	(0.062)	(0.080)
Age2	-0.0012***	-0.0003	-0.0021***	-0.0025***	-0.0012*	-0.0010	-0.0007	-0.0048***	-0.0014***	-0.0079***	0.0036***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)
Age finished	0.0973***	0.2331***	0.2765***	0.2524***	0.0967***	-0.1003***	0.2665***	0.0272***	0.0657***	0.1017***	0.1883***
education	(0.013)	(0.013)	(0.013)	(0.012)	(0.017)	(0.016)	(0.027)	(0.008)	(0.008)	(0.008)	(0.012)
Married	0.0033	-0.9056***	-0.4547	-0.4852	-0.4627	-0.3454	1.4369	0.0433	0.0440	-0.4145	-0.1328
	(0.333)	(0.306)	(0.307)	(0.318)	(0.532)	(0.567)	(0.986)	(0.343)	(0.350)	(0.349)	(0.435)
Divorced	0.1891	-0.8140**	-0.2301	-0.2220	-0.7203	-0.4502	2.1777**	-0.0647	-0.2774	-0.4341	-0.4231
	(0.334)	(0.322)	(0.316)	(0.326)	(0.551)	(0.574)	(1.054)	(0.346)	(0.351)	(0.354)	(0.436)
Widowed	0.3491	-0.6480**	-0.0249	-0.1088	-0.2193	-0.1810	1.3784	-0.1996	-0.2627	-0.4234	-0.0406
	(0.346)	(0.325)	(0.328)	(0.335)	(0.556)	(0.581)	(1.016)	(0.354)	(0.362)	(0.362)	(0.446)
Mean of time-varying regressors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Thresholds	Not reported				-	-	-	-	-	-	-
Constant					-21.980***	-11.132***	-18.852***	-6.9365***	-9.8439***	-4.5253***	-3.1256*
					(2.532)	(2.267)	(3.524)	(1.135)	(1.068)	(1.048)	(1.595)
Rho[a] (intraclass correlation coefficient)	0.741***	0.809***	0.7660***	0.7756***	1.4224***	1.2203***	3.2607***	-0.3284***	-0.6598***	-0.7242***	0.4624***
	(0.007)	(0.005)	(0.007)	(0.006)	(0.060)	(0.062)	(0.045)	(0.063)	(0.073)	(0.074)	(0.060)
Observations	14,619	13,793	13,486	13,956	14,263	14,263	14,263	14,845	14,845	14,845	14,845

Columns (1)-(4): Correlated random effects ordered probit models. Outcome variable has 4 categories: never (0), once/twice a year or less (1), every few months (2), - about once a month or more (3) Columns (5)-(11): Correlated random effects probit models. [a] Percentage of unobserved variation explained by individual effect. Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

4.2 Functionings.

Turning now to the production of functionings, the main results for 11 functionings appear in Table 5. It is noticeable that being male is negatively associated (and statistically significant) with several activity levels, the notable exceptions being newspaper reading, social clubs and the usage of the internet/email. Likewise the age at which a person finishes education tends to be a strong discriminator in the manner one might expect given the cultural aspect of a number of functionings, with those finishing education at higher ages showing a positive and statistically significant association with activity participation. The coefficient on absence of a cardiovascular condition is statistically significant and has a negative association with membership of a sports club (5) and having a hobby (9) suggesting perhaps a remedial or substitutive role for other activities. Across almost all activities the quadratic specification of age is negative and statistically significant indicating that participation in activities declines at older ages. Table A.2 presents average partial effects for the eleven activity variables. In the case of the four ordered frequency variables – eating out, cinema, gallery and theatre, the APEs show the probability of reporting the highest participation in these activities i.e. once a month or more. In the case of the others they represent the probability of being a member or participating in these activities. Across most activities the APE of mean net financial wealth is much larger than current net financial wealth, indicating that activity participation depends to some extent on long term financial status. The APEs for education are stable across most activities with the largest for day trip and using the internet.

4.3 Activity Constraints

The third and final theme we explore with these data concerns the inverse of capabilities, namely the extent to which people report being constrained with respect to the functionings that yield happiness. The results of four models are summarised in Table 6 and in this case we include current levels of functioning to allow for heterogenous tastes. Perhaps the single most robust point to emerge from the models is that men are less likely than women to report wanting to engage in the four activities considered more frequently. In our sample, given their current levels of these activities older individuals are less likely to want to engage in these activities, more as reflected by the negative and statistically significant coefficients on age. Table A.3 presents APEs for the four constraints models representing the probability of reporting ‘wanting to participate more’ in each activity. The results show that apart from

Table 6: Activity constraints

VARIABLES	(1) Cinema [a]	(2) Eating out [a]	(3) Gallery [a]	(4) Theatre [a]
Current frequency- once/twice a year or less*	0.3152***	0.4245***	0.3643***	0.4309***
	(0.083)	(0.117)	(0.079)	(0.070)
Current frequency - every few months*	0.1904*	0.3313***	0.1244	0.2788***
	(0.109)	(0.124)	(0.106)	(0.092)
Current frequency - about once a month or more*	-0.3079**	0.0761	-0.1264	-0.2204*
	(0.142)	(0.125)	(0.154)	(0.127)
No cardiovascular condition	0.0020	0.0428	-0.0752	-0.2234***
	(0.071)	(0.062)	(0.071)	(0.062)
No chronic health condition	-0.0350	0.0564	0.1295	0.0411
	(0.083)	(0.073)	(0.082)	(0.072)
Has good eyesight	-0.0891	0.0011	0.0164	-0.0149
	(0.081)	(0.069)	(0.082)	(0.071)
Married	-0.1891	-0.1286	-0.0091	-0.1572
	(0.422)	(0.414)	(0.426)	(0.417)
Divorced	-0.2911	-0.2661	-0.0900	-0.0650
	(0.435)	(0.424)	(0.444)	(0.439)
Widowed	-0.5154	-0.6377	-0.0760	-0.5134
	(0.441)	(0.429)	(0.450)	(0.435)
Net financial wealth (log)	-0.0823	-0.1435**	-0.0978	-0.0921
	(0.068)	(0.063)	(0.066)	(0.057)
Age	-0.0409***	-0.0066	-0.0417***	-0.0310***
	(0.011)	(0.009)	(0.011)	(0.009)
Age finished education	0.0067	-0.0470***	0.0562***	0.0501***
	(0.013)	(0.011)	(0.013)	(0.011)
Gender (male=1)	-0.3827***	-0.1513***	-0.1378**	-0.4408***
	(0.061)	(0.049)	(0.059)	(0.052)
Mean of time-varying regressors	Yes	Yes	Yes	Yes
Constant	6.4071***	11.4174***	4.1164***	5.7839***
	(0.855)	(0.748)	(0.825)	(0.727)
Rho[b] (intraclass correlation coefficient)	0.8168***	0.4547***	0.7434***	0.5413***
	(0.063)	(0.058)	(0.064)	(0.057)
Observations	12,621	13,160	12,205	13,231

[a] Dependent variable: response to "Would you like to engage in [activity] more often": Yes=1 No=0
Columns (1)-(4): Correlated random effects ordered probit models
*Base reference category –'Never'. [b] Percentage of unobserved variation explained by individual effect. Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

current participation levels mean net financial wealth has the greatest effect on reporting being constrained whilst those with a higher longer term socioeconomic status are less likely to report a constraint. Also, a gradient is visible for three of the activities- cinema, gallery and theatre with those already participating in the activities once a month or more being less likely to want to participate more. This however does not hold in the case of eating out.

5. Discussion and Concluding Remarks

This paper is part of a larger project that explores the measurement and analysis of welfare outcomes generally with the aid of Sen's capabilities approach to welfare economics, and that is probably one of the first in economics to study wellbeing outcomes in older age. Here we have sought to explore the extent to which it is an insightful and feasible tool for helping understand welfare outcomes or quality of life in older age where capability changes are pronounced and particularly associated with biological changes. The capabilities approach emerged as a response to limitations in utilitarian social choice and welfare and we would argue that the formal version of the theory emerges from this application as at, the very least, a valuable addition to the economist's toolkit for measuring welfare outcomes (alongside other approaches that range from income to contingent valuation).

The formal version of the capabilities approach to welfare economics emphasises three classes of dependent variables, each of which we have tried to operationalize using a relatively novel panel dataset on life in older age for the over 50s (ELSA). Our estimation approach exploits the panel nature of the dataset to control for unobserved heterogeneity using a random effects specification. In addition, to test for persistence in reported happiness we use a dynamic specification and include lagged values of happiness and estimate the models separately for men and women. The formal version of the capabilities hypothesises that happiness depends on the doings and beings a person enjoys and the evidence we find tends to confirm this structural feature of the approach. Indeed, a wide range of different kinds of activities are associated with utility measured using life satisfaction scores for both men and women although in some cases, partial effects suggest different quantitative effects between the sexes. There is also some evidence that *social activities* and relations are important for both sexes and possibly more so for women and that internet use is positively related to life satisfaction for men and negatively for women. It is noticeable that chronic health ceases to be statistically significant in models with dynamic specifications, which might reflect the fact that health and happiness are both correlated and persistent.

The overall picture we develop is that happiness in older age is highly multi-dimensional, depends on how older individuals spend their time, and is related particularly for women to involvement in social processes – procedural utility as researchers call it.

The second element of the approach holds that the doings and activities a person engages in depend on the resources to which they have access, underlining the fact that people have different abilities in converting resources into doings and beings. Here we have estimated production functions for some 11 activity functionings using random effects ordered probit models controlling for unobserved heterogeneity and taking a broad conception of resources,

and find again evidence of gender differences even after controlling for health and income. Age at which education was completed proves to be related to the production of all the activities modelled, and although this speaks to the consistency of human capital as an indicator of social involvement or inclusion we should note that that some of those who do not study after 16 years of age (e.g. those with profound learning disabilities) would not have been in a position to benefit from further formal education. Perhaps the key point to note here is the role that education in the teens and beyond may play in promoting a person's social inclusion some 30 to 70 years later.

Finally, we analyse data that speak to a person's capabilities themselves. Specifically we used answers to questions about the extent to which people would like to engage in an activity more as negative capability indicators. Descriptive data, as well as subsequent analysis indicate the existence of two peaks of frustration for men and three for women within the age range studied. More importantly, models of frustration suggest women would like to be more involved in all four activities for which data exists. Given that the models controlled for financial resources and tastes through lagged values of activity involvement, this evidence suggests a potentially novel form of gender inequality with respect to welfare outcomes in older age. A further twist in this story derives from the fact that the pattern is somewhat different for women with less education, for whom the things they want to do more decline gradually over the age range for which we have data. This group is one of the less advantaged groups that we study here and it could be that given their position in society they adapt to the declines associated with older age more effectively than others. However, we cannot at this stage say what drives this result, though we suggest that such variables merit more attention in future.

Nonetheless, we do conclude that the capabilities approach provides a useable framework for understanding welfare outcomes in older age and opens up a range of economic questions that would be less salient from other approaches to welfare economics. In this paper we analysed data on activity frustrations but the dataset we used also contains other indicators that would be relevant to the approach, for example, to do with access to services or health limitations. Of course more data that speak directly to the opportunity and constraint aspects of the capabilities would be useful. In addition, we have shown how work on happiness can be treated as one element of a capabilities approach to human wellbeing. Although the philosophical claims that underpin capabilities and happiness can be different, using the full version of the capabilities approach allows for the inclusion of experienced happiness in any attempt to understand overall wellbeing. The capabilities approach posits a production

function in which experienced happiness depends on activity involvement and we believe that this is an essential aspect of happiness in older age. Furthermore, it would be welcome to see policy-making attention incorporate this insight, particularly where pension incomes are fixed or declining in a number of countries as they attempt to address on-going financial crises.

References

Anand, P., M. Durand and J. Heckman (2011a). 'Editorial: The measurement of progress—some achievements and challenges', *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, vol. **174**(**4**), pp. 851-855.

Anand, P., G. Hunter, I. Carter, K. Dowding, F. Guala and M. Van Hees (2009a). 'The Development of Capability Indicators', *Journal of Human Development and Capabilities*, vol. **10**(**1**), pp. 125-152.

Anand, P., J. Krishnakumar and N. B. Tran (2011b). 'Measuring welfare: Latent variable models for happiness and capabilities in the presence of unobservable heterogeneity', *Journal of Public Economics*, vol. **95**(**3–4**), pp. 205-215.

Anand, P., C. Santos and R. Smith (2009b). 'The Measurement of Capabilities', in (Basu, K. and R. Kanbur Eds.), *Arugments for a Better World*, Oxford: Oxford University Press.

Anand, S. and A. K. Sen (1994). 'Human Development Index: Methodology and Measurement, UN Human Development Report Office, Occasional Papers, New York.

Basu, K. (1987). 'Achievements, capabilities and the concept of well-being', *Social Choice and Welfare*, vol. **4**(**1**), pp. 69-76.

Becchetti, L., A. Pelloni and F. Rossetti (2008). 'Relational Goods, Sociability, and Happiness', *Kyklos*, vol. **61**(**3**), pp. 343-363.

Blanchflower D., G., and A. J. Oswald (2004) Well-being over time in Britain and the USA, *Journal of Public Economics*, **88,** 1359-86.

Bourguignon, F., F. H. G. Ferreira and M. Menéndez (2003) *Inequality of Outcomes and Inequality of Opportunities in Brazil*, William Davidson Institute Working Papers Series no. 2003-630, William Davidson Institute, University of Michigan.

Brandolini, A. and G. D'Alessio (1998) *Measuring Well-being in the Functioning Space*, Banca d'Italia, Research Department.

Burchardt , T. and J. Le Grand (2002) *Constraint and Opportunity: Identifying Voluntary Non-Employment*, LSE STICERD Research Paper no.CASE055, London School of Economics.

Chamberlain, G. (1984). ' Panel data', in (Zvi, G. and D. I. Michael Eds.), *Handbook of Econometrics*, pp. 1247-1318: Elsevier.

Chiappero, M. E. (2000). 'A Multidimensional Assessment of Well-Being Based on Sen's Functioning Approach', *Rivista Internazionale di Scienze Sociali*, vol. **108**(**2**), pp. 207-231.

Clark, A. E. and A. J. Oswald (1994). 'Unhappiness and Unemployment', *The Economic Journal*, vol. **104**(**4**), pp. 648-659.

Clark, A. E. and C. Senik (2011). 'Is Happiness Different From Flourishing? Cross-Country Evidence from the ESS', *Revue d'Economie Politique*, vol. **121**(**1**), pp. 17-34.

Comim, F., M. Qizilbash and S. Alkire (eds.) (2008). *The Capability Approach. Concepts, Measures and Applications*, Cambridge: Cambridge University Press.

Contoyannis, P., A. M. Jones and N. Rice (2004). 'The dynamics of health in the British Household Panel Survey', *Journal of Applied Econometrics*, vol. **19**(**4**), pp. 473-503.

Cunha, F. and J. J. Heckman (2010). 'Investing in Our Young People', NBER Working Paper no. 16201, National Bureau of Economic Research.

Cunha, F., J. J. Heckman and S. M. Schennach (2010). 'Estimating the Technology of Cognitive and Noncognitive Skill Formation', *Econometrica*, vol. **78**(**3**), pp. 883-931.

Daly, M. C. and D. J. Wilson (2009). 'Happiness, Unhappiness and Suicide: An Empirical Assessment', *Journal of the European Economic Association*, vol. **7**(**2-3**), pp. 539-549.

Deaton, A. (2012). 'The financial crisis and the well-being of Americans', *Oxford Economic Papers*, vol. **64**(**1**), pp. 1-26.

Desai, M. and A. Shah (1988). 'An Econometric Approach to the Measurement of Poverty', *Oxford Economic Papers*, vol. **40**(**3**), pp. 505-522.

Dolan, P. and M. P. White (2007). 'How Can Measures of Subjective Well-Being Be Used to Inform Public Policy?', *Perspectives on Psychological Science*, vol. **2**(**1**), pp. 71-85.

Ferrer-i-Carbonell, A. and P. Frijters (2004). 'How Important is Methodology for the estimates of the determinants of Happiness?*', *The Economic Journal*, vol. **114**(**497**), pp. 641-659.

Ferrer-i-Carbonell, A. and J. C. J. M. van den Bergh (2007). 'Economics and happiness: Framing the analysis', *Ecological Economics*, vol. **62**(**1**), pp. 196-198.

Fleurbaey, M. (2006). 'Capabilities, Functionings and Refined Functionings', *Journal of Human Development*, vol. **7**(**3**), pp. 299-310.

Fleurbaey, M. (2009). 'Beyond GDP: The Quest for a Measure of Social Welfare', *Journal of Economic Literature*, vol. **47**(**4**), pp. 1029-1075.

Frey, B. S. and A. Stutzer (2002). 'What Can Economists Learn from Happiness Research?', *Journal of Economic Literature*, vol. **40**(**2**), pp. 402-435.

Frijters, P., J. P. Haisken-DeNew and M. A. Shields (2005). 'The Causal Effect of Income on Health: Evidence from German Reunification', *Journal of Health Economics*, vol. **24**(**5**), pp. 997-1017.

Gabriel, Z. and A. Bowling (2004). 'Quality of life from the perspectives of older people', *Ageing & Society*, vol. **24**(**05**), pp. 675-691.

Gaertner, W., P. K. Pattanaik and K. Suzumura (1992). 'Individual Rights Revisited', *Economica*, vol. **59**(**234**), pp. 161-177.

Hamermesh, D. S. (2003) *Routine*, NBER Working Papers no. w9440, National Bureau of Economic Research.

Herrero, C. (1996). 'Capabilities and Utilities', *Review of Economic Design*, vol. **2**(**1**), pp. 69-88.

Kahneman, D. and A. B. Krueger (2006). 'Developments in the Measurement of Subjective Well-Being', *Journal of Economic Perspectives*, vol. **20**(**1**), pp. 3-24.

Kahneman, D., P. P. Wakker and R. Sarin (1997). 'Back to Bentham? Explorations of Experienced Utility', *The Quarterly Journal of Economics*, vol. **112**(**2**), pp. 375-406.

Kingdon, G. G. and J. Knight (2006). 'Subjective well-being poverty vs. Income poverty and capabilities poverty?', *Journal of Development Studies*, vol. **42**(**7**), pp. 1199-1224.

Klasen, S. (2000). 'Measuring Poverty and Deprivation in South Africa', *Review of Income and Wealth*, vol. **46**(**1**), pp. 33-58.

Krishnakumar, J. (2007). 'Going Beyond Functionings to Capabilities: An Econometric Model to Explain and Estimate Capabilities', *Journal of Human Development*, vol. **8**(**1**), pp. 39-63.

Kuklys, W. (2005). *Amartya Sen's Capability Approach: Theoretical Insights and Empirical Applications*: Springer.

Layard, R. (2011). *Happiness: Lessons from a New Science*: Penguin UK.

Maddala, G. S. (1986). *Limited-Dependent and Qualitative Variables in Econometrics* Cambridge University Press.

Metcalfe, R., N. Powdthavee and P. Dolan (2011). 'Destruction and Distress: Using a Quasi-Experiment to Show the Effects of the September 11 Attacks on Mental Well-Being in the United Kingdom*', *The Economic Journal*, vol. **121**(**550**), pp. F81-F103.

Mundlak, Y. (1978). 'On the Pooling of Time Series and Cross Section Data', *Econometrica*, vol. **46**(**1**), pp. 69-85.

OECD, (2011). *Compendium of OECD Wellbeing Indicators*, OECD Paris.

Peragine, V. (2004). 'Ranking Income Distributions According to Equality of Opportunity', *Journal of Economic Inequality*, vol. **2**(**1**), pp. 11-30.

Powdthavee, N. (2010). 'How much does money really matter? Estimating the causal effects of income on happiness', *Empirical Economics*, vol. **39**(**1**), pp. 77-92.

Pudney, S. (2008). 'The dynamics of perception: modelling subjective wellbeing in a short panel', *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, vol. **171**(**1**), pp. 21-40.

Qizilbash, M. (1997). 'Pluralism and well-being indices', *World Development*, vol. **25**(**12**), pp. 2009-2026.

Ramos, X. and J. Silber (2005). 'On the Application of Efficiency Analysis to the Study of the Dimensions of Human Development', *Review of Income and Wealth*, vol. **51**(**2**), pp. 285-309.

Schokkaert, E. (2007) *The Capabilities Approach*, Center for Economic Studies - Discussion papers no.ces0734, Katholieke Universiteit Leuven.

Schokkaert, E. and L. Van Ootegem (1990). 'Sen's Concept of the Living Standard Applied to the Belgian Unemployed', *Reserches Economiques de Louvain*, vol. **56**(**3-4**), pp. 429-450.

Sen, A. (1979). 'Personal Utilities and Public Judgements: Or What's Wrong With Welfare Economics', *The Economic Journal*, vol. **89**(**355**), pp. 537-558.

Sen, A. (1985). 'Well-being, Agency and Freedom: The Dewey Lectures 1984', *The Journal of Philosophy*, vol. **82**(**4**), pp. 169-221.

van Praag, B. M. S., P. Frijters and A. Ferrer-i-Carbonell (2003). 'The anatomy of subjective well-being', *Journal of Economic Behavior & Organization*, vol. **51**(**1**), pp. 29-49.

Verbeek, M. and T. Nijman (1992). 'Testing for Selectivity Bias in Panel Data Models', *International Economic Review*, vol. **33**(**3**), pp. 681-703.

Volkert, J. (2006). 'European Union Poverty Assessment: A Capability Perspective', *Journal of Human Development*, vol. **7**(**3**), pp. 359-383.

Volkert, J. and F. Schneider (2011) *The Application of the Capability Approach to High-Income OECD Countries: A Preliminary Survey*, CESifo Working Paper Series no. 3364, CESifo Group Munich.

Winkelmann, L. and R. Winkelmann (1998). 'Why are the Unemployed So Unhappy? Evidence from Panel Data', *Economica*, vol. **65**(**257**), pp. 1-15.

Wooldridge, J. M. (2005). 'Simple solutions to the initial conditions problem in dynamic, nonlinear panel data models with unobserved heterogeneity', *Journal of Applied Econometrics*, vol. **20**(**1**), pp. 39-54.

Online Appendix – Selected Average Partial Effects

A 1: Average partial effects on probability of reporting 'strongly agreed' for life-satisfaction - selected variables

	Men	Women
Net financial wealth(log)	0.031(0.022)	0.017 (0.013)
Mean net financial wealth (log)	-0.026(0.018)	0.006 (0.005)
Age	-0.021(0.015)	0.018 (0.014)
Age finished education	-0.002(0.002)	-0.002 (0.001)
Eating out about once a month or more	0.016 (0.011)	0.045 (0.035)
Going the cinema once a month or more	0.067(0.043)	0.022 (0.016)
Going the gallery/museum once a month or more	-0.018 (0.013)	-0.002 (0.001)
Going the theatre once a month or more	-0.012(0.008)	-0.034 (0.028)
Sports club	0.009(0.006)	0.011 (0.009)
Social club	0.013(0.009)	0.030 (0.022)
Church	0.032(0.022)	-0.016 (0.013)
Newspaper	0.008(0.006)	0.001 (0.001)
Hobby	0.014(0.010)	0.013 (0.010)
Day trip	0.027(0.019)	-0.009 (0.007)
Internet	0.024(0.017)	-0.018 (0.014)
Grandchildren	-0.012(0.008)	-0.047 (0.035)
No cardiovascular condition	0.019(0.013)	0.007 (0.005)
No chronic health condition	0.019(0.014)	0.014 (0.010)
Good eyesight	0.001(0.001)	0.012 (0.009)
Lag Happiness (strongly disagree)	0.003(0.002)	-0.061 (0.054)
Lag Happiness (disagree)	-0.015(0.012)	-0.043 (0.036)
Lag Happiness (slightly disagree)	0.002(0.002)	-0.0212 (0.017)
Lag Happiness (slightly agree)	0.033(0.02)	0.033 (0.025)
Lag Happiness (agree)	0.079(0.060)	0.086 (0.070)

Lag Happiness (strongly agree)	0.178(0.093)	0.178 (0.100)

A 2: Average partial effects on probability of reporting 'participation'- Activities (Functionings)

	Eating out	Cinema	Gallery	Theatre	Sports club	Social club	Church	Newspaper	Hobby	Day trip	Internet
Net financial wealth(log)	0.011 (0.001)	0.001 (0.000)	-0.000 (0.000)	0.003 (0.002)	-0.006 (0.002)	0.009 (0.002)	-0.009 (0.001)	-0.008 (0.001)	-0.018 (0.004)	0.007 (0.002)	-0.019 (0.006)
Mean net financial wealth (log)	0.168 (0.020)	0.036 (0.024)	0.036 (0.031)	0.057 (0.041)	0.115 (0.029)	0.010 (0.002)	0.023 (0.004)	0.048 (0.006)	0.120 (0.027)	0.114 (0.025)	0.134 (0.044)
Age	0.028 (0.003)	0.001 (0.001)	0.010 (0.009)	0.017 (0.013)	0.016 (0.004)	0.015 (0.003)	0.005 (0.001)	0.186 (0.023)	0.000 (0.000)	0.236 (0.051)	-0.003 (0.001)
Age finished education	0.018 (0.002)	0.012 (0.008)	0.013 (0.011)	0.015 (0.011)	0.012 (0.003)	-0.013 (0.002)	0.015 (0.002)	0.007 (0.001)	0.017 (0.004)	0.027 (0.006)	0.035 (0.012)
Male	-0.030 (0.004)	-0.024 (0.016)	-0.007 (0.006)	-0.032 (0.023)	-0.035 (0.009)	0.060 (0.009)	-0.057 (0.008)	0.026 (0.003)	0.003 (0.001)	-0.009 (0.002)	0.058 (0.019)
No cardiovascular condition	-0.017 (0.002)	0.005 (0.003)	0.002 (0.002)	-0.002 (0.001)	-0.024 (0.006)	-0.010 (0.002)	-0.004 (0.001)	-0.006 (0.001)	-0.042 (0.010)	-0.018 (0.004)	0.032 (0.011)
No chronic health condition	0.002 (0.000)	0.005 (0.003)	0.007 (0.006)	-0.000 (0.000)	0.010 (0.0027)	0.005 (0.001)	0.012 (0.002)	-0.006 (0.001)	0.038 (0.009)	0.031 (0.007)	-0.000 (0.000)
Good eyesight	0.012 (0.001)	0.007 (0.005)	-0.002 (0.002)	0.003 (0.002)	-0.022 (0.005)	0.008 (0.001)	-0.008 (0.001)	-0.006 (0.001)	0.001 (0.000)	-0.029 (0.007)	0.016 (0.005)
Married	0.001 (0.000)	-0.055 (0.036)	-0.023 (0.019)	-0.030 (0.021)	-0.058 (0.0155)	-0.046 (0.008)	0.076 (0.014)	0.011 (0.001)	0.011 (0.003)	-0.106 (0.027)	-0.025 (0.008)

A 3: Average partial effects on probability of reporting ' constraint' for random effects probit

	Cinema	Eating out	Gallery	Theatre
Net financial wealth(log)	-0.015(0.003)	-0.032(0.005)	-0.018(0.004)	-0.020 (0.002)
Mean net financial wealth (log)	-0.083(0.019)	-0.173(0.027)	-0.079(0.018)	-0.117 (0.014)
Age	-0.007(0.002)	-0.002(0.000)	-0.008(0.002)	-0.007 (0.001)
Age finished education	0.001(0.000)	-0.011(0.002)	0.010 (0.002)	0.011(0.001)
Frequency – once/twice a year or less *	0.056 (0.011)	0.097(0.012)	0.067(0.013)	0.097(0.009)
Frequency – every few months*	0.034 (0.007)	0.075(0.010)	0.023(0.005)	0.062(0.007)
Frequency – about once a month or more*	-0.052(0.013)	0.020 (0.003)	-0.023(0.005)	-0.048(0.006)
Male	-0.068(0.014)	-0.034(0.005)	-0.025(0.006)	-0.098(0.011)
No cardiovascular condition	0.000(0.000)	0.010(0.002)	-0.014(0.003)	-0.049(0.006)
No chronic health condition	-0.006(0.001)	0.013(0.002)	0.024(0.005)	0.009(0.001)
Good eyesight	-0.016(0.004)	0.000(0.000)	0.003(0.001)	-0.003(0.000)
Married	-0.034(0.007)	-0.029(0.004)	-0.002(0.000)	-0.035(0.004)

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