

WHAT MAKES GRANNY AND GRANDDAD HAPPY? LIFE SATISFACTION ACCORDING TO GENDER AMONG OLDER ADULTS IN ENGLAND

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Yemi Oluboyede^{§,#} and Sandy Tubeuf^{§,*}

[§] Academic Unit of Health Economics, Institute of Health Sciences, University of Leeds, Charles Thackrah Building, 101 Clarendon Road, Woodhouse, Leeds LS2 9LJ, UK.

[#] y.oluboyede@leeds.ac.uk

^{*} s.tubeuf@leeds.ac.uk

1. INTRODUCTION

In recent years, many economic studies have been interested in the factors influencing happiness, particularly because the concept of happiness has helped to promote the notion of measurable utility (for an overview see Clark et al. 2006). In terms of the causes of happiness, two topics have arguably attracted most interest, namely the relationship between income and happiness; and the relationship between labour market status, especially unemployment and happiness. These questions are obviously important for the design of labour market policies; nevertheless they are of less interest in elderly population, especially when people are retired. Among elderly people a number of studies have focused on the relationship between quality of life domains and social indicators on life satisfaction or subjective well-being (SWB). Understanding the relationship between health and well-being in old age is of great socio-political importance since European countries experience the highest proportion of older people in the world. Many studies have shown that health is one of the strongest drivers of SWB (Clark & Oswald 2002 and Pettit & Kline 2001 for example) and several researches that have considered this relationship with regard to an elderly population living in the UK include Morgan & Bath (1998), Bennett (2005), Bowling & Farquhar (1991), Bowling (1990), and finally Bowling et al (1993).

However the majority of studies have not explored the particular role played by social activities and network on the life satisfaction in the elderly population. This is of importance considering the great socio-political implications of a maximising the well-being of the elderly in their final years. This article aims to get a step further in the understanding of well-being of older adults. European countries have a unique position in the ageing process of the world population: the demographic changes are manifested by the highest proportion of older people in the world (United Nations 2001). Implications and consequences of an over-ageing society for individual and social life have to be taken up in social, medical, life science and economic fields.

The English Longitudinal Survey of Ageing (ELSA) provides a rich source of data on life satisfaction, social network and activities for a national sample of adults living in England aged 50 and over. It permits the analysis of several questions concerning marital status, number of children, grand children, siblings as well as outing, activities, hobbies and group membership. Individuals can be tracked over several years and in the present paper, the last two waves of the survey are considered. This dataset has already been used to analyse exclusion from social relationships (Barnes et al 2006), isolation and lack of companionship (Demakakos 2008), or absence of contacts (Policy Unit 2008). The focus of our study is on the opposite direction, we take a positive approach of life satisfaction and our main question is about what makes people happy or satisfied with their life. We use ELSA to explore differences in life satisfaction according to gender among older adults exploring the particular role played by social activities and family and social network, independent of wealth and health. We firstly rely on previous results of the literature on the determinants of life satisfaction for elders and then, extend the understanding of life satisfaction in older age according to social activities and family and social network. Furthermore, we explore whether those results vary with gender. Considering that numerous researches have shown that married people enjoy higher life satisfaction than people living alone, the last question we address focuses on people living in couple and we investigate the influence of social activities and social and family networks on life satisfaction of this specific group.

Our analysis is carried out in two parts: the first part uses the full sample whereas the second focuses on people living in couple. Life satisfaction is modelled as a function of personal characteristics, wealth, health, social activities and, family and social networks, which gradually consider more covariates.

The paper is organised as follows. Section 2 describes the background information. Data and methods are presented in section 3. Section 4 presents results and we conclude in a last section.

2. BACKGROUND - STUDIES UTILIZING THE UK ELDERLY POPULATION

As was stated in the introduction several researches have investigated the relationship between well-being and a number of covariates with regard to the elderly population living in the UK. A summary of some of these studies is provided below.

The aim of the study by Bowling (1990) was to determine the impact of social networks and support, functional status and reported morbidity on life satisfaction. Individuals aged 85 and over living at home in City and Hackney were identified from the National Health Service lists of general practitioners (n= 662). A hierarchical multiple linear regression analysis was carried out with life satisfaction as the dependent variable. The covariates were as follows: social network, health status (functional ability and health problems). Multiple regression analysis showed that physical health status was a stronger predictor of emotional well-being in relation to life satisfaction than social network characteristics. The multiple regression analyses showed that, when health status and

network variables were entered into the model, the level functional ability, followed by number of health problems explained the greatest proportion of the variance in life satisfaction score.

Bowling & Farquhar (1991) assessed the effects of social network structure, support and physical health status on psychiatric morbidity using data provided by a sample of Individuals (65 < 85 n=1415) who took part in three independent but comparable surveys in London. Hierarchical multiple linear regression analysis was used. The dependent variable analysed was psychiatric morbidity, operationalised using the General Health Questionnaire. Independent variables included: age, sex, network structure, social support and physical health status. It was found that poor health status was a more powerful predictor of psychiatric morbidity than the social network variables. Age and sex contributed little to the model.

The aims of the analyses presented by Bowling et al (1993) were to document changes in life satisfaction, and associations with these changes, over a two and a half year period among the study members. Individuals were very elderly people (aged 85 years and over from an original pool of 640 people were interviewed in the first time period) living in an East London health district (e.g. City and Hackney) the baseline survey was carried out in 1987, and at follow-up, two and a half years later, in 1990. Hierarchical regression, in the form of residual change analysis, was used to enter the baseline life satisfaction score, followed by other independent variables. Health and functional status and network type were regressed on outcome levels of life satisfaction. The multivariate analysis showed that time period 2 life satisfaction scores were explained mainly by baseline satisfaction score, and that the addition of other variables added little to the model. Functional ability scores and number of health problems were consistently highly significant in the regression model of life satisfaction at time period 1, explaining a quarter of the variation between groups

Morgan & Bath (1998) assess among older people whether, (i) physical activity levels significantly related to indices of psychological well-being after social activity levels are controlled and (ii) whether earlier levels of physical activity related to subsequent levels of psychological well-being? This was done using the Nottingham Longitudinal Study of Activity and Ageing (NLSAA) which includes data on individuals aged 65 and over. The sampling pool of individuals comprised of the following number of individuals over the three time periods n=833 in time period 1, 690 in time period 2 and n=410 in time period 3). Two indices of psychological well-being were evaluated; morale (13-item Life Satisfaction Index (LSD)) and depression. Explanatory variables contained in both models were as follows: physical activity, 14-item health index, of social activity (using the Brief Assessment of Social Engagement (BASE) scale) as well as standard descriptive variables. The authors confirm that their findings strongly reinforce the conclusion that relationships between social activities, health and well-being (and the longitudinal stability of psychological well-being) are both statistically and historically robust. The authors conclude that while physical activity levels are consistent with maintained or improved

levels of functional capacity appear to contribute to subsequent levels of psychological well-being in later life, the contribution is extremely modest. Certainly, the present findings do not provide strong evidence that increases in physical activity (as exercise) will reliably promote improvements in psychological well-being among elderly people living at home.

Bennett (2005) also utilised data from the NLSAA, to examine the combined roles of gender and marital status with respect to psychological well-being using both cross-sectional and longitudinal models. The study population were individuals aged 65 and over. The aims of the study were to address the following questions: Does marital status influence well-being? Is the relationship between marital status and well-being influenced by prior levels of well-being? Are these relationships influenced by either gender or age? Assessments of morale were provided by a modified version of the 13-item Life Satisfaction Index. Levels of social activity were assessed using the Brief Assessment of Social Engagement (BASE) scale. Independent variables were identical for the two models including measured of: age, gender and several dummy variables detailing marital status. Widowhood was found to be associated with declines in social engagement and morale. The psychological well-being of long-standing and recent widowhood differs when prior levels of psychological well-being are controlled for, highlighting the differences between cross-sectional and longitudinal models. Age but not gender contributes to psychological well-being.

None of the studies have investigated the impact of social activities and family and social network on life satisfaction. Whether these covariates have an independent effect to those of wealth or income and health are also unknown. The studies by Bowling (1990), Bowling et al (1993) and Morgan & Bath (1998) investigate the impact health and social networks have on life satisfaction. The study by Bennett (2005) specifically focuses on the relationship between life satisfaction and marital status. We propose to look at the relationship between life satisfaction and the aforementioned covariates for the overall, male and female populations. Finally none of the studies have assessed whether the determinants of life satisfaction differs for people who are co-habiting. Our final analysis will tackle this issue allowing us to evaluate the determinants of life satisfaction for this particular group. Finally the analyses that were carried out in the studies above are based on a significantly smaller sample size than that which we have available from the ELSA dataset.

3. DATA AND METHODS

a. Data

Description of ELSA

The following analyses uses data from the second and the third waves of the England Longitudinal Study of Ageing (ELSA) (Marmor 2003) as the first wave did not include the questionnaire of the score of life satisfaction. The ELSA study follows up all

respondents (core responders) to the Health Survey for England for the years 1998, 1999 and 2001 who were aged 50 and over, alongside their spouses or live-in partners. The dataset contains information on demographic, health, economic, and social information for a national sample of non-institutionalised adults living in England who were born on or before 29 February 1952. ELSA is an ideal data resource to model the determinants of life satisfaction in the elderly population as it contains a wide range of personal information on a large sample of individuals assessed over repeated time points. A general description of the variables we rely upon in our analysis is presented in Table 1.

Dependent variables

Life satisfaction - A major research issue has been whether well-being represents a single construct that can be measured by many indicators or whether it is multidimensional (Lawton 1983). An attempt to answer that question is to take into account several domains. In ELSA, the life-satisfaction is measured as a score generated from five different questions related to desired and attained goals to which the individual answers “*strongly agree, agree, neither agree nor disagree, slightly disagree, disagree, or strongly disagree*”. The score of life satisfaction is simply the result of the sum of their answers and is thus comprised between 5 (very satisfied) and 35 (very dissatisfied). Figure 1 draws the distribution of the life satisfaction in the sample; men and women present the same pattern of life satisfaction in both waves. Life satisfaction is the dependent variable of our study; it is collapsed into binary format. As a threshold value for the classification into the binary format, median life satisfaction is used, which is equal to 13 in wave 3 and 12 in wave 2. Therefore, if the reported satisfaction score on the 35-point scale is below or equal to 13 in wave 3 (respectively 12 in wave 2), the life satisfaction variable is coded as 1, otherwise as 0. In Table 1 it can be seen that this is an even split across individuals in our sample: a bit more than one half of the sample is classed as being satisfied (having a life satisfaction score satisfaction below or equal to the median).

Independent variables

Age - The study by Barrett (1999) shows that age has a moderate effect on life satisfaction when similar age groups are considered. The study utilises the first wave of Americans’ Changing Lives (ACL) general population survey (the analysis was based on individuals aged 30 and over $n = 3,617$). The findings highlight that age effects in the relationships among marital status, social support, and life satisfaction is diminished when age is taken as a categorical variable (30-45 years, 46-60 years, and older than 60). With the specific age range of the individuals included in the ELSA survey we have chosen to leave age as a continuous variable and to include a squared term. From Table 1 we can see that the mean age of our sample is 66 years old.

Marital status - Differences in the levels of life satisfaction have been reported amongst the never married, married, and previously married (Barrett 1999). Statistically

significant differences between the determinants of life satisfaction have been identified for the three different groups. The married are more likely to have the highest levels of satisfaction with the never married and previously married having similar lower levels of satisfaction (Barrett 1999). In our analysis we have separated the marital status variable into five categories. These include single, remarried, separated and widowed. Table 1 shows that single, remarried and widowed represent between 5 and 8% of the sample. A slightly higher proportion of individuals are separated (17%), however the majority of our sample comprises of individuals who are married.

Wealth - Numerous studies in the general population have considered the relationship between income and life satisfaction (see Clark (2006) for example). Nevertheless, we choose to consider household wealth instead of income in the present paper. Indeed, our sample is composed of individuals aged 50 years old and this population is particularly heterogeneous as regard to income levels. Individuals who are less than 55 years old are mainly active, those around the age of 60 (between 55 and 65 years old) are in a transition period between professional activity and retirement and, finally the older individuals are relatively more modest if their income level is considered. In this context, an analysis only based on the monetary resources of the households, that is to say mainly retirement pensions for the 65 years old and more would partially take into account living standards. In fact, the average inheritance and wealth result from a process of accumulation over the life cycle and may be higher for older adults than younger ones. Older adults more often are owners of their housing. In that way, a good tool to proxy the social situation of older adults would be to supplement the usual standard of living measures with a measurement of the household inheritance (Baclet 2006; Jusot 2006). In ELSA, wealth is a generated variable using a precise questionnaire; we use it as provided in the data but considered in quintiles. We have split our data set into 5 quintiles and it can be seen from Table 1 that a similar proportion of individuals fall into quintiles 3, 4 and 5; whilst a smaller proportion of individuals fall into quintile 2. Furthermore, ELSA also provides the amount of total debt in the household. We have generated a binary variable regarding debt, taking the value 1 if the household had a positive value. We can see from Table 1 that almost one third of the sample have debt..

Subjective and objective health - The relationship between health and well-being has already been explored among older adults. Life satisfaction in old age is assumed to be inevitably affected by health and therefore, any analysis of life satisfaction among the oldest old must recognize the important role of health status. Gwozdz and Sousa-Poza (2009) observe a U-shaped relationship between age and levels of life satisfaction for individuals aged between 16 and approximately 65. Thereafter, life satisfaction rapidly declines and the lowest absolute levels of life satisfaction are recorded for the oldest old. This decline is primarily attributable to low levels of perceived health. In that context, despite pursuing another aim than analysing the predicting effect of health on life-satisfaction, we introduce several health variables in our model, which improves its

quality. Self-assessed health, as reported into very good, good, fair, poor, very poor is considered as well as having at least one long-standing illness. Table 1, reports the distribution of individuals in each of these categories (except very good health reference group). More than half of the individuals perceive their health to be good or very good, with the smallest proportion of individuals perceiving their health very poor.

Social activities/Leisure activities - Leisure activities, such as going on holidays, having a hobby or going to the cinema, are expected to improve well-being in the same way as social capital positively influences health and life-satisfaction. Therefore, the study explores the effect of a set of social and leisure activities, such as having a hobby or pastime, having taken a holiday in the UK in the last 12 months, having taken a holiday abroad in the last 12 months, having gone on a daytrip or outing in the last 12 months, going to the cinema more than twice a year, going to an art gallery or museum more than once a year, going to the theatre, a concert or the opera at least once a year. Finally, we also considered whether the respondent is a member of a political party, resident group, association or social club and whether he belongs to a church or other religious groups. Table 1 shows the descriptive statistics for social network variables. Most individuals in the sample report to have a hobby (77%) or to be member of a group (67%). Additionally, 60% of the sample has been on holiday in the UK and a bit less have been on a holiday abroad in the last 12 months (50%). Going on a day trip or outing in the last 12 months is also quite widespread in the population and concerns 67% of the population. . A smaller and similar proportion of individuals has visited an art gallery/museum or theatre or been to the cinema more than twice in the last 12 months (40%). As for church or religious groups, more than a fifth of the individuals report to be involved.

Family and social network - ELSA provides information on descendants and family. Whereas many studies have investigated the extent to which social capital and participation in community activities predicts happiness, health, and life satisfaction, family history has been seldom considered in the literature. We introduce various binary variables for family network characteristics. First of all, we consider whether the person has children as well as whether he has living brother(s) or sister(s) (one living sibling, two living siblings, three living siblings four and more living siblings). The number of grandchildren is also considered as a continuous variable. Finally, social network is considered using a binary variable for reporting having friends. From Table 1, the majority of individuals in our sample have children and report that they have friends. A third of the individuals have 1 alive sibling still living but those with 3 and more still living siblings represent about 25%, which is quite unexpected regarding the average age of the sample. Regarding the information about grandchildren, it is not available for the full sample but when available, people have on average 4.5 grandchildren. , One hundred of individuals have reported having up between 24 and 77 grandchildren.

b. Econometric framework

The determinants of life satisfaction are usually investigated in a microeconomic life satisfaction model with life satisfaction as the dependent variable, explained by various socio-demographic and socio-economic variables.

The main questions we address in the analysis are: (i) what are the determinants of life satisfaction for elders? (ii) how do these determinants vary in relation to social activities and family and social network? (iii) how do these determinants vary with gender? Considering that numerous researches have shown that married people enjoy higher life satisfaction than people living alone, the last question we address is (iv) controlling for health and income, what is the influence of social and family networks on life satisfaction on people living in couple?

Let assume y_{it} the generated binary variable of life satisfaction of individual i at wave t that relates to reported life satisfaction Y_{it}^* as follows:

$$y_{it} = \begin{cases} 1 & \text{if } Y_{it}^* \leq \text{median}(Y_i^*) \\ 0 & \text{if } Y_{it}^* > \text{median}(Y_i^*) \end{cases}$$

Life satisfaction is assumed to be a function of individual characteristics by x_{it} and unobserved characteristics, represented by an error term u_{it} . This error term is supposed to be independent over time. The marginal probability of being satisfied with life at wave t is given by:

$$P(y_{it} = 1 | x_{it}) = \Phi[(x_{it}\beta)]$$

We successively estimate three equations of life satisfaction production functions, which gradually consider more determinants of health.

$$y_{it} = 1(x_{it}^1\beta^1 + u_{it}) \quad (\text{model 1})$$

$$y_{it} = 1(x_{it}^1\beta^1 + x_{it}^2\beta^2 + u_{it}) \quad (\text{model 2})$$

$$y_{it} = 1(x_{it}^1\beta^1 + x_{it}^2\beta^2 + x_{it}^3\beta^3 + u_{it}) \quad (\text{model 3})$$

In a first benchmark model, we estimate the impact of demographic variables, marital status, wealth, debt and health status, represented by the vector x_{it}^1 . That initial specification comes from evidence in literature about significant determinants of life satisfaction. The second model introduces a set of social activities, such as hobby, holidays, museums, membership, represented by the vector x_{it}^2 . Finally, the set of social and family network characteristics is added into the third model using the vector x_{it}^3 .

Regression analyses are conducted in two parts. In the first part, the three models are carried out on full sample and on the two subsamples of females and males. In the second part, we focus on people living in couple. People living alone are either never married or widowed people. Never married people have been extensively studied: they are viewed as lifelong isolates (Gubrium 1974) and the fact that they have experienced the absence of a spouse and most of the time, the absence of children (Barrett 1999) then to rule out evident correlations between family network and singlehood then the third model is carried out on the full sample of people living in a couple and on the two subsamples of females and males living in a couple. Probit regression models are undertaken in each case in a pooled and fixed-effect framework.

4. RESULTS

a. The primary determinants of life satisfaction for elders

The second column of Table 2 shows the marginal effects on life satisfaction of the individual characteristics from the vector x_{it}^1 , marginal effects are computed at the means of the independent variables.

Despite the absence of gender or age effects on life satisfaction, our results confirm evidence from previous literature. Regarding marital status, older people being single are negatively and significantly associated with life satisfaction; they are 22 percentage points less likely to be satisfied than people who are married. Similarly, separated people or widows respectively are 19.5 and 24 percentage points less likely to be satisfied in life than married people. Re-married are also significantly less satisfied than married people but to a lesser extent. The socioeconomic status is also significantly associated with the probability of satisfaction. The higher the level of household wealth, the higher the probability of being satisfied: people in the fifth quintile are 12 percentage points more likely to be satisfied than people in the lowest quintile and marginal effects of wealth on life satisfaction shows a gradient of life satisfaction with wealth quintiles. Having debt negatively affects life satisfaction and is associated with a 5.2 percentage point lower probability of satisfaction. Our primary model also confirms well-know results on the deterioration of life satisfaction because of poor health. Self-reported health lower than very good is significantly associated with a reduction in the probability of being satisfied ranging from 11 percentage points lower when the elderly person reported good health up to 40.3 percentage points lower when he reported very poor health.

We now focus on gender differences in life satisfaction presented in the fifth and the eight columns of Table 2. We observe that the life satisfaction of men is associated with a 8.1 percentage points higher probability of life satisfaction when they are in the fourth wealth quintile as compared to other men in the first quintile, whereas the difference is of only 5.4 percentage points for women in the same context. The association between health and life satisfaction also differs with gender: men's life satisfaction is much more affected by a poorer health status than women's life satisfaction. Whereas, women are 8.2

percentage points less likely to be satisfied when they report having good health in comparison with very good health, the corresponding marginal effect of reporting good health in comparison with very good health equals 14.2 percentage point for men.

b. The role of social activities and family and social network on life satisfaction

A large set of social activities is now introduced in the model and results corresponding to this model are presented in Table 2 in the three columns labelled Model 2. The new set of variables does not change the previous significant results and add some potential explanatory variables to life satisfaction. Unexpectedly, going to the cinema more than twice in a year significantly reduces life satisfaction. This activity is associated with a round 5 percentage point lower probability of being satisfied with life, the probability being lower for women. Maybe going to the cinema is more a lonely activity and is done in replacement of a preferred activity, which may explain that it reduces life satisfaction.

In the full sample, it shows significant and positive effects of having holidays, going on a day trip, going to the theatre or being member of a church. More precisely, as compared to people not having holidays, having holidays increases by 6.6 percentage points life satisfaction for holidays spent in UK and by 9.1 percentage points for holidays spent abroad. Going on a day trip, or to the theatre as well as visiting at least once an art gallery or a museum in the last twelve months are associated with a roughly 4 percentage points higher probability of satisfaction. The membership to a church also increases life satisfaction by a 3 percentage points higher probability but with a weak significance level.

There are some differences between gender once the social activities covariates are introduced to the model. The life satisfaction of both men and women show significant positive influences of going on holiday (in the UK or abroad). For women going on a day trip increases the probability of satisfaction by 6.7 percentage points. Men however are significantly and negatively affected by going to an art gallery or museum as this decreases life satisfaction by 6.3 percentage points compared to not going to these places over the past 12 months. Going to the theatre has a positive significant affect on men by increasing their life satisfaction by 5.6 percentage points compared to not going to the theatre over the past 12 months. Again for both genders, going to the cinema has a consistently negative impact on being satisfied compared with not going to the cinema over the past 12 months. This has a greater impact on men's life satisfaction by reducing the probability of life satisfaction by 5.6 percentage points (compared to 4 percentage points for women's satisfaction).

In the third model, we introduce family and social network. As expected the introduction of family network rule out the significant negative effect of singlehood on life satisfaction. The correlation between lack of family network and being single explains the changes in marginal effects and encourage us to carry out a separate analyse on the subsample of married people. Except being single, most of the associations of life satisfaction with variables from the two first vectors remain. Among the family and social

network characteristics, the number of grand children as well as reporting to have friends is the only two significant characteristics. The probability of satisfaction increases with the number of grand children and that result is significant at 1% for women but only at 10% for men. Having friends is statistically associated with life satisfaction showing a 15 percentage points higher probability of life satisfaction in the full sample. The results also show that women are more positively affected by the presence of friends than men.

c. The influence of social and family networks on life satisfaction on people living in couple

The marginal effects on life satisfaction of people living in couple is presented in Table 3. Looking at the full sample the significant results are the same for the variables that make up the primary model. However this does not hold true for the social activities family and social network covariates. For individuals not living alone going on a holiday abroad, going on a day trip and going to the cinema no longer have a significant impact on the probability of satisfaction. Going to the theatre or being a member of a church does now have a positive impact on satisfaction if you are living as a couple (by 11 and 7.8 percentage points higher probability than if you do not participate in these activities). In terms of the family and social network variables, having grandchildren or friends no longer has a significant impact on satisfaction if you are living as a couple. This may be explained by the fact that people in couple are more likely to be grand-parents when they are married and so, this effect disappears because we do not make a comparison with people experiencing singlehood. Nevertheless, the new positive effect of having children on life satisfaction can come from the specificity of the sample, which concerns older people. Indeed, they may receive care from their children if they are in need of care or support in daily life activities and having children may provide that help and so improve life satisfaction. Having children or 3 living siblings now has a positive impact on the probability of being satisfied however just having one living sibling had the opposite effect. This differentiated effect of number of siblings may be explained by the fact that a unique sibling may be a person in need of care and so, considered by the individual as a burden if that brother or sister requires support; whereas a larger number of siblings will offer more opportunities to share provision of care or even to have potential providers of care.

When men and women are individually considered given that they are living as a couple there are some similarities that become apparent in terms of health and wealth. Men's life satisfaction is still more affected by poor health than women's life satisfaction and women's satisfaction are more affected by social conditions both wealth and debt than men (which also holds true for being in debt). Interestingly once women only living as a couple are considered having a long-standing illness no longer significantly affects their life satisfaction. The satisfaction of men is now affected by whether or not they go to the theatre or whether they are a member of a church group once they are not living alone. For women these variables have a significant positive impact on satisfaction increasing the probability by 16 and 8 percentage points (respectively 9 and 7 for men) compared to not carrying out these activities. Women who are members of a group seem

to be negatively affected by this with the probability of being satisfied decreasing by 7.5 percentage points compared to not being a member of a group. This may come from a membership which is not an individual choice but an obligation, which is very demanding for women. This could therefore induce stress and pressure. Finally conversely to men, having children, having 3 siblings that are alive and one living sibling has a significant impact on the life satisfaction of women living not living alone. The latter having a negative impact on the probability of satisfaction and the former two variables having a positive impact.

5. DISCUSSION

Our research confirms the effect of marital status, health and socioeconomic aspects on life satisfaction and extends the understanding of the life satisfaction of older women and men in England showing significant and positive influence of social activities and family and social network.

More precisely, leisure activities have a positive effect on life satisfaction of both men and women. Having holidays either in the UK or abroad as well as day trip increases their life-satisfaction. When in couples, men and women's life satisfaction is also significantly and positively influenced by going to the theatre and belonging to church or to a religious group. Regarding family and social network, having numerous grand children appears to increase positively the life satisfaction of grandparents, particularly the grand-mothers when we focus on people living in couple. Surprisingly, if grandparents enjoy that role, their life satisfaction does not improve with their parental role and we do not find any significant effect about having children. However, focusing on people living in couple shows that women's satisfaction is positively influenced by having children. On the full sample, life satisfaction is strongly influenced by friendship in both genders. On the contrary, when we focus on married people, the positive effect of having friends vanishes, and we find other interesting results regarding siblings. The life satisfaction of women in couple reduces by round 7 percentage points when they have one living sibling whereas their life satisfaction increases by 9.4 percentage point when they have three living siblings. The potential explanation can be found in the provision of care. One living sibling may be in need for care as he is also likely to be old, whereas three living siblings may be a support for a shared provision of care between siblings. Similarly, being part of an association or an organisation induces a deleterious effect on the life satisfaction of women in couple and this may come from that women have various tasks and roles to play and may have to belong to some organisations with no choice. This may then induce stress and pressure. On the contrary, the life satisfaction of men living in couple is unaffected by family and social network.

As expected, health status negatively influences life satisfaction, particularly among men's life satisfaction.

Those preliminary results are particularly promising and needs to be confirmed by econometric robustness checks. Some results such as those related to activities, grandchildren and siblings are particularly unforeseen and would merit further investigation. Moreover, we have several intuitions for interpretations of results related to informal care and social capital that may need to be both supported by literature and introduction of specific variables of that type.

Our approach is quite limiting at the moment and we could expand the explanatory variables to include measures of family change such as shock variables for separation, divorce, death of spouse/children/grand children, grand children being born. Additionally, years of education and more health indicators such as disability and medical handicap could be used. Furthermore, the absence of information for some activity variables have lead us to carry out the analyses on reduced samples for model 3. To boost sample size, unknown parameters could be generated whenever a characteristic is unknown for a subset of individuals.

6. REFERENCES

Baclet A. Les seniors : des revenus plus faibles pour les plus âgés, compensés par un patrimoine plus élevé. Les revenus et le patrimoine des ménages. Edition 2006 ed. 2006. p. 25-37.

Barnes, M., Blom, A., Cox, K., and Lessof, C. (2006). The Social Exclusion of Older People: Evidence from the first wave of the English Longitudinal Study of Ageing (ELSA) - Final Report. Office of the Deputy Prime Minister, London

Barrett, A. (1999) Social Support and Life Satisfaction among the Never Married: Examining the Effects of age. *Research on Aging*, 21: 46-72

Bennett, K. (2005) Psychological wellbeing in later life: the longitudinal effects of marriage, widowhood and marital status change. *Int J Geriatr Psychiatry*, 20, 280-4.

Bowling, A. (1990) Associations with life satisfaction among very elderly people living in a deprived part of inner London. *Soc Sci Med*, 31, 1003-11.

Bowling, A. & Farquhar, M. (1991) Associations with social networks, social support, health status and psychiatric morbidity in three samples of elderly people. *Soc Psychiatry Psychiatr Epidemiol*, 26, 115-26.

Bowling, A., Farquhar, M., Grundy, E. & Formby, J. (1993) Changes in life satisfaction over a two and a half year period among very elderly people living in London. *Soc Sci Med*, 36, 641-55.

Clark, A. Frijters, P. & Shields, M. (2006) Income and happiness: evidence, explanations and economic implications, Technical Report no24, Paris-Jourdan Sciences Economiques Working Paper

Clark A, Oswald A (2002). A simple statistical method for measuring how life events affect happiness. *International Journal of Epidemiology*, 31(6):1139-44.

Demakakos P. (2008). Being socially excluded and living alone in old age: Findings from the English Longitudinal Study of Ageing (ELSA). Policy Unit - Age Concern England.

Gubrium, Jaber F (1974). Marital Desolation and the Evaluation of Everyday Life in Old Age. *Journal of Marriage and the Family*, 36:107-13.

Gwozdz and Sousa-Poza (2009). Ageing, Health and Life Satisfaction of the Oldest Old: An Analysis for Germany. IZA DP No. 4053

Jusot F. The shape of the relationship between mortality and income in France. *Annales d'Economie et de Statistique* 2006;(83-84):89-122.

Marmor M, Banks J, Blundell R, Lessof C, Nazoo J. Health, wealth and lifestyles of the older people in England: The 2002 English Longitudinal Study of Ageing. London: Institute of Fiscal Studies, 2003.

Lawton M. (1984). Investigating health and subjective well-being: substantive challenges. *Int J Aging Hum Dev*, 19(2):157-66

Morgan, K. & Bath, P. A. (1998) Customary physical activity and psychological wellbeing: a longitudinal study. *Age Ageing*, 27 Suppl 3, 35-40.

Pettit J, Kline J (2001). Are Happy People Healthier? The Specific Role of Positive Affect in Predicting Self-Reported Health Symptoms. *Journal of Research in Personality*, 4: 521-536.

Policy Unit - Age Concern England. (2008). Out of sight - out of mind. Social exclusion behind closed doors. Age Concern England. (a report based on reference ii)

United Nations (2001) World population ageing: 1950-2050. Department of Economic and Social Affairs Population Division, New York.

7. FIGURES AND TABLES

Figure 1 - Distribution of the life satisfaction score in ELSA

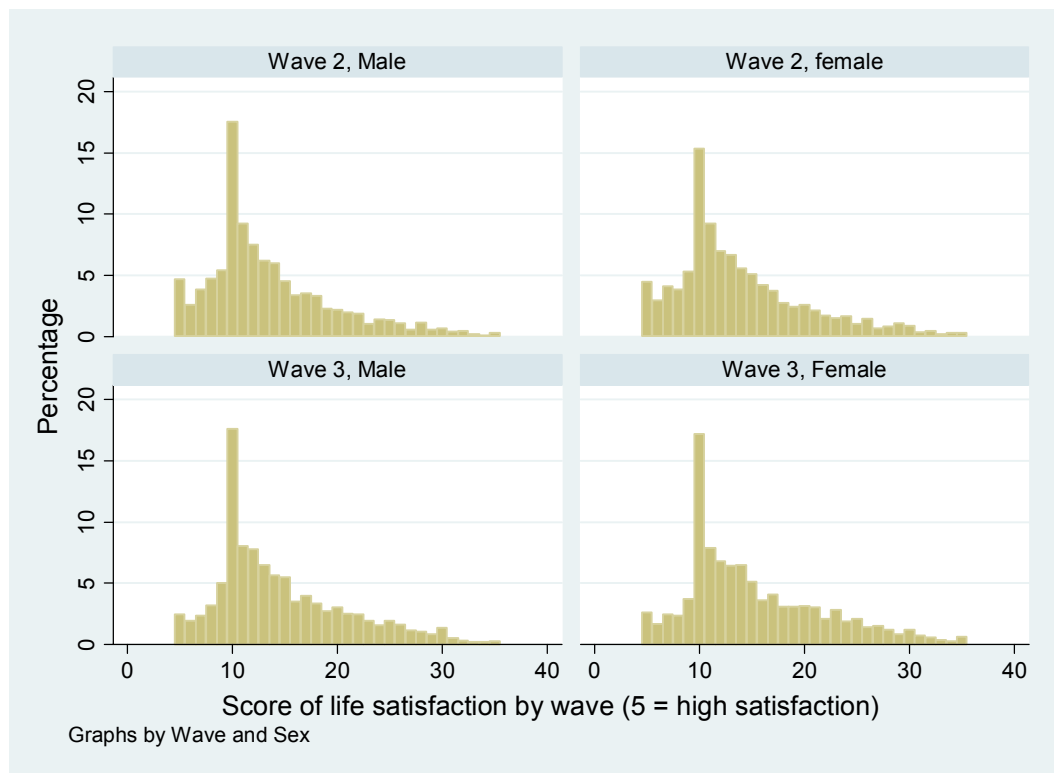


Table 1 – Descriptive statistics

Variable	Sample	Mean	SE	Min	Max
Satisfaction	11037	0.53	0.499	0	1
Female	11037	0.55	0.498	0	1
Age	11037	66.28	9.088	52	99
Single	11037	0.05	0.213	0	1
Remarried	11037	0.06	0.243	0	1
Separated	11037	0.17	0.373	0	1
Widow	11037	0.08	0.277	0	1
Wealth quintile 2	11037	0.17	0.373	0	1
Wealth quintile 3	11037	0.21	0.404	0	1
Wealth quintile 4	11037	0.22	0.416	0	1
Wealth quintile 5	11037	0.26	0.438	0	1
Debt	11037	0.29	0.454	0	1
Long-standing illness	11030	0.56	0.497	0	1
Good SAH	11037	0.38	0.485	0	1
Fair SAH	11037	0.28	0.450	0	1
Poor SAH	11037	0.11	0.315	0	1
Very poor SAH	11037	0.03	0.171	0	1
Hobby	11037	0.77	0.423	0	1
Holidays in UK in the last 12 months	11037	0.60	0.491	0	1
Holidays abroad in the last 12 months	11037	0.51	0.500	0	1
Gone on a day trip or outing in the last 12 months	11037	0.67	0.470	0	1
Cinema more than twice a year	10007	0.39	0.487	0	1
Art gallery /museums in the past 12 months	9776	0.40	0.489	0	1
Theatre in the past 12 months	8253	0.38	0.486	0	1
Membership (political, neighbourhood, social/sport clubs)	11037	0.67	0.471	0	1
Member of a church or religious group	11037	0.22	0.411	0	1
Children	10899	0.88	0.328	0	1
Number of grand-children	7471	4.54	4.175	0	77
One alive sibling	11037	0.33	0.469	0	1
Two alive siblings	11037	0.21	0.405	0	1
Three alive siblings	11037	0.11	0.312	0	1
Four alive sibling or more	11037	0.13	0.334	0	1
Friends	10953	0.95	0.208	0	1

Table 2 – Marginal effects on life satisfaction computed at the means of the independent variables (pooled Probit model, balanced panel)

	Full sample			Women			Men		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Female	0.003 -0.012	-0.004 -0.014	-0.025 -0.018						
Age	-0.034 -0.061	-0.038 -0.075	0.001 -0.098	0.017 -0.082	0.038 -0.103	0.078 -0.134	-0.1 -0.092	-0.125 -0.109	-0.076 -0.146
Age2	0.001 -0.001	0.001 -0.001	0 -0.001	0 -0.001	0 -0.001	-0.001 -0.002	0.002 -0.001	0.002 -0.002	0.001 -0.002
Single	-0.220*** -0.026	-0.201*** -0.03	-0.068 -0.146	-0.202*** -0.038	-0.210*** -0.043	-0.065 -0.189	-0.230*** -0.038	-0.198*** -0.042	-0.095 -0.201
Remarried	-0.078*** -0.02	-0.067*** -0.024	-0.072** -0.029	-0.077*** -0.029	-0.074** -0.035	-0.086** -0.041	-0.079*** -0.028	-0.060* -0.034	-0.054 -0.041
Separated	-0.195*** -0.015	-0.182*** -0.018	-0.188*** -0.022	-0.194*** -0.019	-0.193*** -0.024	-0.199*** -0.027	-0.190*** -0.027	-0.165*** -0.031	-0.167*** -0.039
Widow	-0.240*** -0.018	-0.214*** -0.023	-0.216*** -0.027	-0.239*** -0.022	-0.215*** -0.028	-0.210*** -0.032	-0.215*** -0.036	-0.202*** -0.043	-0.215*** -0.051
Wealth quintile 2	0.03 -0.02	0.023 -0.024	0.021 -0.029	0.029 -0.026	0.009 -0.033	0.005 -0.039	0.033 -0.03	0.042 -0.035	0.04 -0.043
Wealth quintile 3	0.044** -0.019	0.027 -0.024	0.034 -0.029	0.050* -0.026	0.017 -0.033	0.02 -0.04	0.036 -0.029	0.038 -0.034	0.055 -0.042
Wealth quintile 4	0.065*** -0.019	0.066*** -0.023	0.066** -0.029	0.054** -0.026	0.031 -0.033	0.03 -0.04	0.081*** -0.029	0.104*** -0.033	0.104** -0.042
Wealth quintile 5	0.120*** -0.019	0.087*** -0.024	0.102*** -0.03	0.121*** -0.026	0.077** -0.034	0.115*** -0.042	0.117*** -0.028	0.103*** -0.035	0.093** -0.044
Debt	-0.052*** -0.013	-0.063*** -0.016	-0.078*** -0.02	-0.054*** -0.018	-0.079*** -0.022	-0.084*** -0.028	-0.051*** -0.019	-0.048*** -0.022	-0.072** -0.029
Long-standing illness	-0.058*** -0.012	-0.051*** -0.014	-0.061*** -0.018	-0.052*** -0.016	-0.040** -0.02	-0.063*** -0.025	-0.066*** -0.018	-0.065*** -0.021	-0.061** -0.027
Good SAH	-0.110*** -0.015	-0.101*** -0.017	-0.109*** -0.022	-0.082*** -0.02	-0.058** -0.024	-0.057* -0.031	-0.142*** -0.021	-0.146*** -0.025	-0.170*** -0.032
Fair SAH	-0.200*** -0.016	-0.192*** -0.019	-0.192*** -0.025	-0.198*** -0.022	-0.180*** -0.027	-0.160*** -0.034	-0.203*** -0.024	-0.202*** -0.027	-0.226*** -0.035
Poor SAH	-0.297*** -0.018	-0.277*** -0.022	-0.290*** -0.027	-0.299*** -0.024	-0.277*** -0.03	-0.275*** -0.037	-0.293*** -0.027	-0.274*** -0.032	-0.306*** -0.039
Very poor SAH	-0.403*** -0.021	-0.393*** -0.025	-0.401*** -0.03	-0.374*** -0.03	-0.363*** -0.037	-0.383*** -0.041	-0.434*** -0.03	-0.419*** -0.035	-0.429*** -0.044
Hobby		0.003 -0.017	-0.001 -0.021		-0.034 -0.023	-0.043 -0.028		0.044* -0.025	0.049 -0.031
Holidays in UK in the last 12 months		0.066*** -0.014	0.069*** -0.018		0.068*** -0.02	0.069*** -0.024		0.071*** -0.021	0.074*** -0.027
Holidays abroad in the last 12 months		0.091*** -0.014	0.078*** -0.018		0.117*** -0.02	0.103*** -0.024		0.064*** -0.021	0.051** -0.026
Gone on a day trip or outing in the last 12 months		0.038** -0.015	0.041** -0.019		0.067*** -0.022	0.059** -0.026		0.013 -0.022	0.03 -0.028
Cinema more than twice a year		-0.048*** -0.016	-0.050** -0.02		-0.040* -0.023	-0.060** -0.028		-0.056** -0.023	-0.044 -0.029
Art gallery /museums in the past 12 months		-0.041* -0.021	-0.015 -0.027		-0.019 -0.031	-0.005 -0.039		-0.063** -0.029	-0.033 -0.038
Theatre in the past 12 months		0.046** -0.022	0.029 -0.028		0.037 -0.031	0.046 -0.039		0.056* -0.031	0.019 -0.041
Membership (political, neighbourhood, social/sport clubs)		-0.009 -0.015	-0.014 -0.019		-0.013 -0.021	-0.023 -0.025		-0.01 -0.022	-0.01 -0.028
Member of a church or religious group		0.031* -0.017	0.011 -0.021		0.027 -0.022	-0.006 -0.028		0.037 -0.027	0.036 -0.033
Children			0.038 -0.078			0.091 -0.105			-0.005 -0.113
Number of grand-children			0.008*** -0.002			0.010*** -0.003			0.006* -0.003
One alive sibling			-0.011 -0.024			-0.028 -0.032			0.012 -0.035
Two alive siblings			-0.02 -0.026			-0.054 -0.036			0.012 -0.037
Three alive siblings			-0.001 -0.032			-0.043 -0.043			0.04 -0.047
Four alive sibling or more			-0.012 -0.03			-0.032 -0.041			0.01 -0.044
Friends			0.148*** -0.034			0.181*** -0.047			0.131*** -0.048
Observations	11030	7629	4936	6038	4002	2703	4992	3627	2233

Robust standard errors on second row

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3 – Marginal effects on life satisfaction of people living in couple computed at the means of the independent variables (pooled Probit model, balanced panel)

	Full Sample	Female	Male
	Model 3	Model 3	Model 3
Female	-0.014 (0.020)		
Age	-0.107 (0.183)	0.076 (0.216)	-0.374 (0.288)
Age2	0.002 (0.003)	-0.001 (0.003)	0.006 (0.004)
Wealth quintile 2	0.055 (0.034)	0.074 (0.049)	0.037 (0.048)
Wealth quintile 3	0.055* (0.033)	0.068 (0.048)	0.046 (0.045)
Wealth quintile 4	0.111*** (0.032)	0.116** (0.047)	0.107** (0.044)
Wealth quintile 5	0.119*** (0.033)	0.142*** (0.048)	0.101** (0.046)
Debt	-0.061*** (0.023)	-0.074** (0.033)	-0.053* (0.031)
Long-standing illness	-0.045** (0.020)	-0.037 (0.029)	-0.056** (0.029)
Good SAH	-0.118*** (0.025)	-0.057 (0.036)	-0.176*** (0.035)
Fair SAH	-0.201*** (0.028)	-0.158*** (0.042)	-0.241*** (0.039)
Poor SAH	-0.289*** (0.033)	-0.252*** (0.051)	-0.324*** (0.044)
Very poor SAH	-0.426*** (0.039)	-0.431*** (0.059)	-0.439*** (0.051)
Hobby	0.078 (0.110)	0.150 (0.207)	0.059 (0.128)
Holidays in UK in the last 12 months	0.006** (0.003)	0.008* (0.005)	0.007 (0.004)
Holidays abroad in the last 12 months	-0.004 (0.027)	-0.013 (0.041)	0.005 (0.038)
Gone on a day trip or outing in the last 12 months	-0.011 (0.030)	-0.060 (0.046)	0.021 (0.040)
Cinema more than twice a year	-0.004 (0.036)	-0.048 (0.053)	0.028 (0.051)
Art gallery /museums in the past 12 months	-0.033 (0.034)	-0.062 (0.050)	-0.003 (0.047)
Theatre in the past 12 months	0.110*** (0.040)	0.160*** (0.061)	0.098* (0.053)
Membership (political, neighbourhood, social/sport clubs)	-0.025 (0.024)	-0.075** (0.034)	0.023 (0.034)
Member of a church or religious group	0.078*** (0.021)	0.080*** (0.030)	0.073** (0.029)
Children	0.067*** (0.020)	0.107*** (0.030)	0.028 (0.028)
Number of grand-children	0.018 (0.021)	0.020 (0.031)	0.022 (0.030)
One alive sibling	-0.052** (0.023)	-0.076** (0.033)	-0.030 (0.031)
Two alive siblings	-0.030 (0.030)	0.000 (0.045)	-0.054 (0.040)
Three alive siblings	0.069** (0.031)	0.094** (0.045)	0.049 (0.043)
Four alive sibling or more	0.015 (0.021)	0.023 (0.031)	0.004 (0.030)
Friends	0.002 (0.024)	-0.033 (0.034)	0.036 (0.035)
Observations	3550	1706	1844

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%