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The Effect of Employment on the Subjective Well-Being of 60-80 Year Old People

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The Effect of Employment on the Subjective Well-Being of 60-80 Year-Old People

Abstract

Purpose

The current study investigates the association of employment at older age (60-80 years old) with the cognitive component of subjective well-being (SWB) – life satisfaction.

Methodology

Out of The Survey of Health, Ageing and Retirement in Europe (SHARE), our sample included 58,197 observations of participants aged 60 to 80 years old from 18 countries. We estimate the direct effects of employment and number of working hours on life satisfaction, while considering the characteristics of the job and their impact.

Findings

Results reveal that individuals who do not work enjoy a higher level of life satisfaction and so do those who work in developing jobs. Work under pressure reduces the level of SWB and working in physically demanding jobs has no significant impact on SWB. The results confirm previous findings regarding the positive contribution of self-employment to individual SWB.

Value

The results allow policy makers to implement policy measures that can improve older workers' SWB.

Keywords: *Subjective well-being, Life satisfaction, Employment, SHARE, Older workers*

Introduction

The ancient inquiry into the determinants of individual happiness has recently become one of the vigorously discussed subjects in economic literature, and has attracted the attention of diverse social scientist (Diener et al., 2017; Frey and Stutzer, 2002; Clark, 2018). Research in the economics of happiness established a systematic relationship between subjective well-being (SWB) data and important economic factors, such as employment status and income (Clark et al., 2018). Moreover, the objective benefits of SWB for individuals, entrepreneurial activity and society have been extensively reported in literature (e.g., Clark et al., 2018; Naudé et al., 2014; Stephan, 2018). Health, income, social behavior, and workplace success are among these benefits (Oswald et al., 2015; De Neve et al., 2013).

The current study aims at contributing to literature by investigating the association of employment at older age (60-80 years old) with the cognitive component of SWB – life satisfaction. Population aging is a worldwide phenomenon, which carries significant impacts over employment, income, and the labor market. Labor force participation of older workers is growing, and a growing number of older workers choose to continue working partially or fully, instead of ceasing abruptly all forms of paid employment (Axelrad, 2018).

Previous studies that examined the associations between life satisfaction of older people and their employment status revealed some puzzling findings. On one hand, literature shows that being unemployed carries a significant negative effect on life satisfaction (Abolhassani and Alessie, 2013) and that employment is beneficial for older age SWB. Nikolova and Graham (2014) explored the relationship between different work patterns and SWB. In their study, voluntary part-time workers were found to be happier and to experience less stress and anger compared to other employees, and late-life workers under voluntary part-time (or full-time) arrangements were found to experience a higher level of SWB compared to retirees. Other results displayed no short-term effects of retirement on mental health, but a strong negative

longer-term impact was detected. This impact survived a battery of robustness tests and applied equally to women and men as well as to people of different educational backgrounds (Heller-Sahlgren, 2017).

On the other hand, other studies suggest that retirement carries no negative effect over older age life satisfaction (Clark and Fawaz 2009; Steptoe and Lassale, 2018). Moreover, some scholars found that retirement appears to actually improve psychological well-being (Fonseca et al., 2015) once the endogeneity of retirement is accounted for (Charles, 2002). Calvo et al. (2009) found that the key factor was not the type of transition (gradual or immediate retirement) but whether people perceived the transition as a result of their free choice – Older adults who wanted to prolong their work careers but were unable to do so reported lower levels of life satisfaction compared to retirees who did not consider other forms of employment (Dingemans and Henkens, 2014). In another study, involuntary retirement was found to be detrimental to life satisfaction compared to voluntary retirement. Yet, taking a bridge job was found to mitigate this negative shock (Dingemans and Henkens, 2014).

The current study aims to shed new light on the role of employment in older age SWB. We use the database of the Survey of Health, Ageing and Retirement in Europe (SHARE) and present two main contributions: (1) methodologically – we show that the variables 'employed' and 'hours worked per week' are endogenous, and therefore we use a two-stage regression in the analyses. We used the variable 'Age' as an instrument variable (IV) since it has a strong correlation with the endogenous explanatory variables, which ensures a strong first stage. Psychological literature supports the notion that life satisfaction is essentially independent of age (e.g., Diener et al., 1999; Argyle, 2001). Previous research that used TSLS did not refer to an 'employment' variables, but rather to other endogenous variables (Charles, 2002), e.g. whether or not an individual has retired, while considering the 'retirement environment', meaning the social security system and the elimination of mandatory retirement rules at the

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time of retirement. (2) Empirically – beyond studying the employment status of 'employed' versus 'not employed', we also look at the effect of the number of work hours and the nature of work (physically demanding, allow an opportunity to develop new skills, stressful) on older age SWB. This is an innovative point of view, which will allow policy makers to implement policy measures regarding work-retirement (leisure) balance, which can improve older workers' SWB.

Literature Review

The increase in life expectancy is followed by a gradual rise in pensionable age (Axelrad and Mahoney, 2017) – the age in which a person becomes eligible for pension benefits – increasing the labor force participation of older workers and prolonging working life in OECD countries.

Previous studies in the economics of happiness revealed the relationship between SWB and employment status (Clark and Oswald, 1994; Clark et al., 2008; Layard, 2005; Weimann et al., 2015). It has been shown that work per se, in contrast to 'work as bad' thesis (Spencer, 2009), carries a consumption value, which contributes substantially to one's SWB across their lifecycle (Jahoda, 1981; Darity and Goldsmith, 1996; Sherman and Shavit, 2012; 2018). Consequently, Bonsang and Klein (2012) found that termination of employment and involuntary retirement carry a negative effect on life satisfaction, probably due to a drop in income satisfaction and a smaller increase in satisfaction with the free time.

Steptoe and Lassale (2018) investigated various factors that affect the life satisfaction of older people, including retirement and unemployment, but their results were inconclusive (since they did not find a difference in life-satisfaction between people who retired and those whose situation remained constant) and their database included no information on the job characteristics.

When older workers from 15 countries were asked about the reasons for choosing semi-retirement, it turned out that their motivations were mainly positive, like "I would like to keep active/keep my brain alert" (44%) and "I like working" (39%). Other reasons were: "I cannot afford to retire full time" (23%), and "My household expenditure is higher than I envisaged" (13%; HSBC, 2013). It should be noted that not every person will end up in an extended working life, since this option is enabled under specific employment circumstances (self-employed, advantaged occupational positions) as well as favorable psychosocial circumstances (high control and balance between effort and reward). Naturally, good mental and physical health are also needed to allow people beyond the age of 65 to continue working (Wahrendorf et al., 2017). Thus, as employment participation rates decline with age (Axelrad, 2018), the sample of those who remained employed is likely to be very different from those who have retired (De Wind, et al., 2013, Axelrad, 2018).

Several studies explored the influence of personal characteristics on SWB. Thus, on average, it was found that life-satisfaction levels were slightly higher for men than for women, although this pattern varies with age (Steptoe and Lassale, 2018). In the same research, Steptoe and Lassale (2018) found that age had a positive effect on life-satisfaction levels, moving from relatively low levels at the 50–54 age group and reaching a peak around the age of 70–74. One possible explanation may be that older people increasingly focus on a restricted set of positive experiences and social contacts, whereas in middle age, people focused on work and other less appealing aspects of life.

Fonseca et al. (2015) used a simultaneous model of retirement, income, and SWB and found that income does not seem to have a significant effect on depression or life satisfaction. This observation is in contrast with the correlations in the raw data that showed significant relations between income and depression and life satisfaction. In addition, participation in

bridge employment for financial motives was found to be associated with a decrease in life satisfaction compared to postretirement work based on intrinsic motives (Dingemans and Henkens, 2014).

The current research is innovative because we highlight the SWB of the individual and estimate the contribution of employment at older age (60-80 years old) to subjective well-being. Moreover, we estimate the direct impact of employment and employment characteristics on one's cognitive well-being.

Our conceptual contribution is the use of 2SLS model. The econometric method that was used stems from the finding that employment was an endogenous variable, i.e., it was-correlated with the error term of the econometric model.

In their empirical research, which analyzed various data sets, Blanchflower and Oswald (2017B) found that in the 60-80 age group, the correlation between age and SWB is ambiguous, and can be insignificant. However, in their paper, two very important control variables were ignored: health level and personal income. Thus, Blanchflower and Oswald's results do not contradict our assumption that age has no significant effect on SWP at this age group.

Several papers considered the U shape relation between the level of happiness and age. These papers focused on the age of the minimum point of the curve, and paid no attention to the right part of the curve for higher ages. For example, see Cheng, Powdthavee, and Oswald (2017). In Nikolova and Graham's (2014) paper, a quadratic function of age was estimated, and a U-shape relation was established. In addition, the paper did not include the health variable as an explanatory variable, and due to the high collinearity between age and health it is impossible to evaluate the direct impact of age on happiness.

The Theoretical Model

The research question in the current study is whether and to what extent personal attributes, employment status and job characteristics affect the SWB of individuals aged 60-80.

The decision to continue working or retire depends on various variables, such as: Current wage rate, assets and other income sources, the utility derived from leisure; the utility and disutility derived from work (such as, enjoying or disliking one's job), social interactions during work and the social value of work.

In addition, the decision is affected by various personal characteristics, such as one's health condition, gender, and marital status. An individual decides to continue working if their utility of working is higher than that of retiring. The number of working hours is chosen to maximize their expected present value of his utility. The government may affect this decision in two major ways: First, by setting a certain age in which the individual is entitled to get their social security allowance as well as tax reductions on funds. Second, by setting a policy of compulsory retirement in various workplaces. This way, a person who wants to continue working may suffer a major reduction in their wage rate. The government's decisions about these two age limitations can affect a person's decision to retire.

The effects of age on psychological well-being is a matter of dispute between two perspectives. One, held by happiness economists, asserts the U shape pattern (e.g., Blanchflower and Oswald, 2004; 2017B), which means that SWB is unstable over time. Blanchflower and Oswald show evidence for midlife crisis, after which the quality of life improves. The other perspective is held by certain psychologists, who argue that midlife crisis is a myth, since there are "virtually no data to support the assertion that the midlife crisis is universal experience" (Rauch, 2018. P.43). We follow the psychological point of view. The independence of SWB and age may be explained by the notion that the effects of age on SWB are mainly indirect – through the impact of age on other variables like health, income, employment, social connections and more.

Health naturally declines over time for most of the public. Thus, when age progresses, health declines and SWB is down ceteris paribus. However, the curve that shows the average

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health level by age shifts upward as time progresses. Hence, it seems that the indirect impact of age on SWB through its effect on health declines over time.

Individual income usually increases when age progresses, mainly because around the age of 50, most people already own their home and their children have grown and left the house, reducing the food and utilities expenses as well. Often, income also rises when social security allowance and other retirement funds are received around the ages 60-70, depends on the specific policy in each country (Andreoni and Galmarini, 2016), note, that in some countries, where the social security system is not developed and the personal saving rate is low, the opposite result holds. Higher income was found to be associated with higher SWB (Blanchflower and Oswald, 2017A; Clark et al., 2018).

Methods

Sample and Data

In the current study, waves 2 (2006-2010), 4 (2010-2012), 5 (2013) and 6 (2015) of The Survey of Health, Ageing and Retirement in Europe (SHARE) were used. SHARE is a nationally representative survey, designed to provide longitudinal and cross-sectional information on the social conditions, health and employment of people aged 50 and over from European countries[1] (Borsch-Supan et al., 2013). The total sample included 58,197 observations of participants aged 60 to 80 years old, from 18 countries (Austria, Belgium, Croatia, Czech Republic, Denmark, Estonia, France, Germany, Greece, Israel, Italy, Luxembourg, Poland, Portugal, Slovenia, Spain, Sweden, and Switzerland) as detailed in Table 1. For each participant we used the data from the latest wave.

[Insert Table 1 about here]

The Econometric Model

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[1] SHARE covers 27 European countries and Israel (http://www.share-project.org/).

We use the following notation:

E – Employmen. Employed =1, Unemployed=0.

H – Working hours per week.

X – A set of personal characteristics (including health condition)

I – income

Age – age

D – Set of dummy variables for countries and waves

S – Satisfaction level

CJ – Job characteristics: CP – Physical job, CD – Developing job, CU – Work under pressure,

CS – Self-employed, CV – Voluntary work.

The employment decision function is:

$$S_i = \beta_0 + \beta_1 * X_i + \beta_2 * I_i + \beta_3 * D_i + \beta_4 * E_i + \beta_5 * E_i * CJ_i + u_i \ (1)$$

As Ei was endogenous, the 2SLS method was used. In the first stage, the following

employment function was estimated:

$$Ei = \alpha_0 + \alpha_1 * Age_i + \alpha2 * Age_i^2 i + \alpha_3 * X_i + \alpha_4 * D_i + \varepsilon_i \ (2)$$

At this stage, we estimated a reduced form of the equation, which explains the employment

decision.

Logit method was employed since the dependent variable was dichotomous. Then, the

predicted Ei (denoted by PEi) was calculated and replaced Ei:

$$S_i = \beta_0 + \beta_1 * X_i + \beta_2 * I_i + \beta_3 * D_i + \beta_4 * PE_i + \beta_5 * PE_i * CJ_i + u_i \quad (3)$$

The estimation results are presented in Table 3.

The next equations show the impact of the number of working hours on SWB for those who

were employed:

$$S_i = Y_0 + Y_1 * X_i + Y_2 * I_i + Y_3 * D_i + Y_4 * H_i + Y_5 * H_i * CJ_i + u_i \quad (4)$$

Since it was found that the variable H, working hours per week, was endogenous, 2SLS method was used. In the first stage, the following working hours function was estimated:

$$H_i = \delta_0 + \delta_1 * Age_i + \delta_2 * Age_i^2 + \delta_3 * X_i + \delta_4 * D_i + \varepsilon_i \qquad (5)$$

The above function was estimated, and the predicted number of hours (denoted by PH_i) was calculated. PH_i replaced H_i to estimate the second stage function:

$$S_i = \gamma_0 + \gamma_1 * X_i + \gamma_2 * I_i + \gamma_3 * D_i + \gamma_4 * PH_i + \gamma_5 * PH_i * CJ_i + u_i \qquad (6)$$

The estimation results of the above function are presented in Table 4.

Measures

SWB was estimated by using the dependent variable 'Satisfaction with life'. Self-perceived 'satisfaction with life' was measured using a 10-point Likert scale with responses ranging between completely dissatisfied (0) to completely satisfied (10). The wording of the question was: *"On a scale of 0 to 10, where 0 means completely dissatisfied and 10 means completely satisfied, how satisfied are you with your life?"*

Individual Socio-Demographic Characteristics

Based on the variables that had been found to have a significant impact on SWB in previous studies, several individual-level characteristics were included in the analysis. Age was limited in our sample, which included only people between the ages 60 and 80.

We controlled for gender; females were coded 1 and males were coded 0. Marital status was a categorical variable coded and divided into the fourth following categories: (1) married or living with spouse (2) never married (3) divorced (4) widowed. The first category served as a reference group. Number of children was a continuous variable ranging between 0 and 19. 'Years of Education' was a continuous variable. IADL (Instrumental Activities of Daily Living) test was used to assess the objective health status of the respondent, as a continuous variable ranging between 0 and 9. The IADL variable is indeed self-reported. However, self-rated health has become a conventional measure of health status at the general population level. Self-rated

health reflects an individual's integrated perception of health, and is known to incorporate various physical, mental and social aspects of health (Jylhä, 2009; Niedhammer *et al.*, 2013). This measure has been studied intensively in sociological health research, as well as in epidemiological and medical research due to its validity as predictor of both morbidity and mortality (Kaplan *et al.*, 1996; Idler and Benyamini, 1997; Jylhä, 2009; Risse *et al*., 2014). Regarding IADL, it also provides an objective health assessment of the respondent, as it asks specific questions about limitations with instrumental activities of daily living (such as preparing a hot meal and working around the house or garden).

We also controlled for total household net income, which was provided by SHARE. This figure was divided by the square root of household members and adjusted for purchasing power parity. Then, we ranked all households within each country based on household income and divided into income index quintiles (Axelrad, Sabbath and Hawkins, 2018). Thus, the income variable was divided into 5 categories: (1) lowest 20%, (2) 21–40%, (3) 41–60%, (4) 61–80%, and (5) upper 80%.

Literature suggests that voluntary work at older aged is beneficial for SWB (Sherman and Shavit, 2012). Therefore, we used the variable 'Done voluntary or charity work', which was coded 1 if the answer was "yes" and 0 if the answer was "no". Finally, we controlled for the wave in which the data were collected and the country of residence to capture general influences like wars, natural disasters, and global problematic issues.

Descriptive statistics of the variables used for the analysis as well as T and Chi-square tests checking the bivariate association between working/not working people at the 60-80 age group and the explanatory variables are presented in Table 2.

[Insert Table 2 about here]

Job Characteristics

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The continuous variable 'Hours worked per week' was based on participants' report about their: "*total number of hours usually worked per week*", which ranged between one and 70 hours per week or more. This explanatory variable was found to be endogenous and therefore, as detailed below, we used instrumental variables and 2SLS analysis. The dichotomous variable 'Employed' was based on the same question about work hours. It was coded 1 if a person worked 1 hour per week or more, and 0 if a person worked less than 1 hour per week.

Three employment indicators were examined for individuals who were coded as 'employed', to assess the nature of their job. To examine the significance of the job, we created the variable 'Development' based on the answers to the question: *"I have an opportunity to develop new skills (Would you say you strongly agree, agree, disagree or strongly disagree?)"* Participants who replied 'strongly agree' or 'agree' were coded 1, while the rest were coded 0. To examine the extant of pressure involved in the job we created the variable 'Pressure' based on the question: *"I am under constant time pressure due to a heavy workload. (Would you say you strongly agree, agree, disagree or strongly disagree?)"* Participants who replied 'strongly agree' or 'agree' were coded 1, and the rest were coded 0. Additionally, the variable 'Physically' was used to examine whether the job was physically demanding based on the question: *"My job is physically demanding (Would you say you strongly agree, agree, disagree or strongly disagree?)."* Participants who replied 'strongly agree' or 'agree' were coded 1, others were coded 0.

The last variable – 'Self-employed' – was coded 1 if self-employed and 0 otherwise. It should be noted that the components of job characteristics measured in our sample were all self-assessed, based on the perceptions of respondents, but it was found that subjective measures of job quality may reflect objective job quality (Brown, Charlwood, Forde and Spencer, 2007).

Statistical Analysis

The aim of the econometric analysis is to estimate the direct effects of employment and number of working hours on satisfaction with life, while considering the characteristic of the job. Two-Stage least squares (2SLS) regression analysis was used since Hausman test for endogeneity (Hausman, 1978) revealed that the explanatory variables – 'Hours worked per week' and 'Employed' were endogenous. Thus, we used the variable 'Age' as IV, since it has a strong correlation with the endogenous explanatory variables, which ensures a strong first stage. First stage and second stage of the analysis are presented in Table 3 and Table 4.

We first present results for the entire sample – working and not working individuals (*N*=58,197) with the explanatory variable 'Employed'. Since the variable 'Employed' was endogenous, we used the value of 'Predicted Employed'. We also used interactions between 'Predicted Employed' and the job characteristics since the data about job characteristics were being collected only for employed participants. As the explanatory variable 'Employed' is a dummy variable, in the first stage we estimated it by using the Logit model. Dummies for 18 countries and the 4 waves were used but not presented (available upon request).

We also present results for working individuals (N=10,273) with the explanatory variable 'Hours worked per week'. Since this variable was endogenous, we used the value of 'Predicted hours worked per week', as well as interactions between job characteristics and 'Predicted hours worked per week'.

Results

The estimated coefficients of a 2SLS regression model, in which 'Satisfaction with life' was regressed on a wide range of personal and job control variables, reveal the effect of being employed at ages 60-80 on SWB. Table 3 presents the detailed analysis (first and second stages). Since our data revealed that no significant correlation could be found between age and life satisfaction for people aged 60-80 years old, the variable 'Age' served as IV.

The model's first stage provided information regarding the probability of being employed. Age was found to be negatively associated with the probability of being employed and females were found to have a lower probability of being employed. As for marital status, it was found that those who never got married and those who were divorced had a higher probability of being employed (compared to married individuals), while widowed had lower probability of being employed. Those who were more educated were more likely to be employed, as well as those who did voluntary activities. As expected, poor health was associated with a lower probability of being employed.

The model's second stage provided information about the associations between the explanatory variables and SWB. Two rows are presented. In the first stage (N=58,197), all job characteristics missing data were coded 0 ("not apply"), and on the second (N=6,342), all missing observations were omitted. No substantial difference was found between the two. The sign of the coefficients of socio-demographic explanatory variables were as expected; those who were still married were found to have a higher level of life satisfaction. More children were found have a positive effect on life satisfaction of elderly people, as well as a higher income level. Higher education was also found to be associated with greater life satisfaction of elderly people, and so did voluntary work, while poor health condition (high IADL) was found to reduce life satisfaction. No significant difference was found between not employed males and females with regards to life satisfaction.

The main finding regarding the impact of employment on life satisfaction was that generally, for a regular type of job, which is not physical, pressured or developing – those who do not work enjoy a higher level of life satisfaction. In the next stage, we compared the group of participants whose work is physical, pressured or developing with the group employed in a regular type of job, and found the following: Those who worked in developing jobs enjoyed a higher level of life satisfaction. It turns out that the sum of coefficients of the two variables

'Employed' and the interaction of 'Employed' and 'Development', was found to be significantly positive. I.e., a person who works in a developing job enjoys higher life satisfaction compared to a person who is not employed.

Work under pressure was found to be negatively associated with the level of satisfaction, and finally, self-employed who worked enjoyed a higher level of life satisfaction with life compared to other employees.

As for countries' differences, Germany was used as a reference country, since it is the largest economy in Europe (Axelrad 2018). We found that respondents who live in Scandinavian countries (Sweden and Denmark) enjoy a higher level of life satisfaction compared to Germany, while those who live in former communist countries (like Poland, Estonia, Slovenia etc.) experience a lower level of life satisfaction compared to Germany.

[Insert Table 3 about here]

The estimated coefficients of a 2SLS regression model, which included only employed individuals, are presented in Table 4. In this table, 'Satisfaction with life' was regressed on a wide range of personal and job control variables and revealed the effect of numbers of hours worked per week at ages 60-80 on SWB. Table 4 presents first and second stages, and it can be seen that in the first stage, age was found to have a negative effect on working hours, females were found to work a lower number of hours per week, more years of education were positively associated with the number of working hours and doing voluntary activity was found to be negatively associated with the number of hours worked per week.

Second stage revealed the effect of hours worked per week on SWB. Two columns are presented. In the first (N=10,273), all job characteristics missing data were coded 0 (i.e., all missing data were assigned as 'not apply') and in the second (N=6,288), all missing observations were omitted. Only a minor difference was found between the two.

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When coding all missing job characteristics data as 0 (not physically demanding, not working under pressure and not developing), the impact of hours worked per week was found to be negative: Those who worked more hours experienced a lower level of life satisfaction. The negative effect was found to be stronger for work under pressure. Note, that the estimated coefficient of the interaction variable 'Predicted hours worked per week' X Development' was found to be positive. However, the effect of an additional hour of work on a developing job (the sum of the coefficients of 'Hours worked per week' and 'Hours worked per week X Development' did not significantly differ from zero. A possible explanation is the notion that the individual derives their satisfaction from the work itself, and not necessarily from the number of hours at work.

No significant effect was found for being a female, working in a physically demanding job or being self-employed (in addition to the general negative effect). As for countries' differences, the same results were obtained regarding the impact of employment on life satisfaction.

[Insert Table 4 about here]

Discussion

The research question in the current study was whether and to what extent personal attributes, employment status and job characteristics affect the SWB of individuals aged 60-80. The findings reveal that individual characteristics like gender, years of education, health, marital status and number of children significantly affect life satisfaction. Our contribution to the body of research is that the assessment that intrinsic features of the job – related to the nature of work itself (Frey and Stutzer, 2010) – such as pressure, physically demanding job and opportunity to develop new skills – are associated with life satisfaction at older age.

Another contribution of the current study is the use of 2SLS model (Charles, 2002). The econometric method enables us to distinguish between the direct effect on life satisfaction

(satisfaction of being employed) and the indirect satisfaction through a higher level of income or other personal characteristics. The coefficient of the variable 'Employed' is the direct effect on satisfaction. Adjusting for endogeneity is a plausible explanation for the puzzling findings in literature regarding the contribution of work *per se* to individual well-being. Our data revealed that no significant correlation could be found between age and life satisfaction for people aged 60-80 years old, and therefore 'Age' served as IV.

The findings regarding individual characteristics were usually consistent with previous studies. Thus, for example, poorer health was found to be associated with lower levels of satisfaction with life (Borg, Hallberg, and Blomqvist, 2006; Dolan, Peasgood, and White, 2008), married people were found to be happier than those living alone (Frey, 2018; Siemers, and Robson, 2017) and among the employed individuals, higher income was found to be associated with higher levels of satisfaction with life (Borg et al., 2006)

As for the effect of being employed, generally, those who are not employed were found to have a higher life satisfaction, and those who work more hours per week on average feel less satisfied, perhaps since they must work more hours per week than they would ideally like to achieve a higher income. These findings are consistent with the neoclassical perspective, according to which, work is a disutility. For some types of work, however, the contrary does exist. For example, those who are employed in jobs that offer opportunity to develop new skills enjoy higher level of life satisfaction than those who are not employed. New skills combined with a creative effort at work is a paved path for various measures of SWB (Sherman and Shavit, 2018). For those who work under constant time pressure due to a heavy workload – the contrary does hold. And finally, self-employed status was found to be associated with a higher level of life satisfaction compared to other employees, probably due to a more intrinsically rewarding work and higher levels of self-determination and freedom (Benz and Frey, 2008A, B)

The main conclusion is that from the elderly point of view, in some types of work or professions, continued employment positively contributes to life satisfaction. Retirement is traditionally pictured as an option for living a life without the burden of having to work. Yet, our results demonstrate that leisure without work is not always the most favorable choice. People who derive satisfaction from the intrinsic features of their job should postpone retirement.

The timing of retirement should be decided while considering the type of work and profession. Literature shows that some people experience flow at work (Csikszentmihalyi, 1990). Therefore, continuous work in an intrinsically rewarding job combined with investment in relevant skills and knowledge is a path leading to the optimal experience.

Most of the elder employees prefer to work in part time jobs (without losing their income). The exception is those who work in jobs that offer opportunities for development. The negative effect of the number of working hours on SWB may be the result of people working longer hours due to income considerations. When we hold the income constant, longer working hours are found to be negatively associated with SWB. A second explanation can be that the latent consequences of employment, such as imposition of a time structure on the waking day, social interactions, status and identity and activity (Jahoda, 1981) are not related to the number of working hours.

The current study included data from 18 European countries. Therefore, in the analyses, we controlled for the country of residence to capture general differences between countries in policies, regulations, and culture. However, in our analyses, we could not refer to all differences, as countries have implemented different mechanisms and policy measures to influence the pension system and effective retirement age. Some countries increased their official retirement age (e.g. Israel, Czech Republic, Estonia and France), changed the income

and means testing rules of the pension system (France and Germany), changed contribution rates (Israel, Hungary), altered tax rules (France, Germany, Ireland and Israel) and changed the rules concerning early retirement (Austria and Germany) (OECD, 2017). Thus, future studies is required to explore country-based differences and implement a spatial analysis methodology. This analysis could be particularly important in terms of social policy design. Organizations will be able to use these results to better understand the reasons and motives of older workers, and thus better adjust to the challenges of population ageing and its impacts on organizations. The results of these analyses can help to inform policy aiming to encourage labor supply by older workers. Policy makers will be able to implement policy measures that can improve older workers' well-being. As many older workers have to continue working, the policy of prolonged employment undervalues engagement in activities beyond employment, and neglects the potential risks for those who continue to work or are required to seek work (Taylor, 2019). Policy makers must take into account the potential well-being-enhancing effects of retirement, and search for ways to improve the SWB of those who stay in the labor market.

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Table 1: Number of participants by country

	Working 1 hour per week or more (% of working of total)	*Not Working*	*Total*
Austria	325 (8.9%)	3,309	3,634
Belgium	604 (13.5%)	3,873	4,477
Croatia	136 (9.3%)	1,326	1,462
Czech Republic	870 (16.8%)	4,322	5,192
Denmark	823 (28.3%)	2,082	2,905
Estonia	1,042 (24.5%)	3,216	4,258
France	475 (12.1%)	3,456	3,931
Germany	958 (22.0%)	3,389	4,347
Greece	544 (15.3%)	3,021	3,565
Israel	611 (33.2%)	1,228	1,839
Italy	532 (11.7%)	4,026	4,558
Luxembourg	115 (10.3%)	1,000	1,115
Poland	179 (10.5%)	1,529	1,708
Portugal	178 (14.1%)	1,087	1,265
Slovenia	179 (5.6%)	2,992	3,171
Spain	584 (13.7%)	3,692	4,276
Sweden	1,261 (31.9%)	2,691	3,952
Switzerland	857 (33.7%)	1,685	2,542
Total	**10,273 (17.7%)**	**47,924 (82.3%)**	**58,197 (100%)**

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Table 2: Descriptive Statistics for variables of interest

Variable	Working (1 hour per week or more)	Not Working	T test/ χ^2
	N=10,273	N=47,924	
Age (Avg.)	64.3	69.9	94.6***
Gender (male) [a]	55.7%	44.4%	-20.8***
Marital Status (married) [a]	77.9%	76.0%	637.9***
Average Number of Children (Avg.)	2.15	2.15	0.17
Years of Education (Avg.)	12.5	10.3	-47.6***
IADL [b] (Avg.)	0.07	0.42	29.9***
Quintiles of Income (Avg.)	3.63	2.86	-51.2***
Doing Voluntary Work [a]	18.8%	14.5%	121.6***
Self-employed [a]	25.4%	3.0% [c]	-85.7***

*p < 0.1, **p < 0.05, ***p < 0.01

Note: [a] Frequency in the sample. [b] Rated from 0 to 9, number of limitations with instrumental activities. [c] Were self-employed in last job.

Table 3: The effect of being employed, job characteristics and other socio-demographic variables on SWB (coefficients)

Dependent variable	Employed		Satisfied		Satisfied	
Remarks	All sample		All sample		No missing data	
Method	Logit (first stage)		OLS (second stage)		OLS (second stage)	
Age	-1.20654	***				
Age Square	0.007362	***				
Female	-0.48966	***	0.000187		-0.1750764	*
Never married	0.189865	***	-0.33771	***	-0.22286	**
Divorced	0.385028	***	-0.40651	***	-0.2084	***
Widowed	-0.15693	***	-0.43655	***	-0.18335	
Years of education	0.100101	***	0.027589	***	0.013144	**
IADL	-0.59737	***	-0.40511	***	-0.29938	***
Number of children	0.073509	***	0.063631	***	0.037066	
Quantile (1-5)						
Income (Q2)			0.211399	***	0.107138	
Income (Q3)			0.317872	***	0.176746	***
Income (Q4)			0.439214	***	0.336414	***
Income (Q5)			0.449999	***	0.387488	***
Doing voluntary work	0.123516	***	0.331978	***	0.160437	***
Employed (Predicted)			-0.44172	***	-0.4032157	**
Employed (predicted) X female			-0.06165		0.29256	
Employed (predicted) X physically demanding			-0.09156[b]	**	-0.00335	
Employed (predicted) X pressure			-0.10864[b]	***	-0.3739	***
Employed (predicted) X development			0.470786[b]	***	0.643224	***
Employed (predicted) X self employed			0.097218[b]	***	0.195474	**
N	58,197		58,197		6,342	
R-squared	0.22[a]		0.11		0.16	

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

a Pseudo R Squared.

b Due to missing values for those who are not employed, the actual value of the variable "employed" is used.

Note: Dummies for countries and waves were used but not shown. Married is the reference group for marital status. IADL is measured on a 0-9 Likert scale. Job characteristics: developed, pressure and physically demanding are dichotomous variables,1= agree, 0= disagree.

The P-Values are not robust. We conducted robustness estimation for some of the variables and found that the differences between the two models were marginal.

Table 4: The effect of hours worked per week, job characteristics and other socio-demographic variables on SWB of working people (coefficients)

Dependent variable	Hours worked per week		Satisfied "No answer" coded 0		Satisfied "No answer" were omitted	
Method	OLS (first stage)		OLS (second stage)			
Age	-3.96974	***				
Age Square	0.020193	***				
Female	-7.35382	***	-0.04788		-0.26535	
Marital status						
Never married	0.4676403		-0.25393	**	-0.22584	**
Divorced	-0.109996		-0.19656	***	-0.2096	***
Widowed	0.7885073		-0.32705	***	-0.18424	*
Years of education	0.110262	***	0.01601	**	0.01117	***
IADL	-1.61948	***	-0.46972	***	-0.26959	***
Number of children	-0.0823		0.046479	***	0.042931	
Quantile 2			0.107913	*	0.089189	
Quantile 3			0.18953	***	0.160092	***
Quantile 4			0.329459	***	0.308579	***
Quantile 5			0.423345	***	0.3607	***
Doing voluntary work	-3.62991	***	0.104127	**	0.180571	***
Hours Worked (Predicted)			-0.00958	**	-0.00103	
Hours Worked (Predicted) X female			-0.00101		0.006902	
Hours Worked (Predicted) X physically demanding			-0.00052		-0.0007	
Hours Worked (Predicted) X pressure			-0.00552	***	-0.0051	***
Hours Worked (Predicted) X development			0.007225	***	0.009339	***
Hours Worked (Predicted) X self employed			0.000918		0.001005	
N	10,273		10,273		6,288	
R-squared	0.18		0.16		0.16	

$*p < 0.1$, $**p < 0.05$, $***p < 0.01$

Note: Dummies for countries and waves were used but not shown. Since the variable employed was endogenous, all interactions included the predicted value of employed. Married is the reference group for marital status. IADL is measured on a 0-9 Likert scale. Job characteristics: developed, pressure and physically demanding are dichotomous variables,1= agree, 0= disagree.

The P-Values are not robust. We conducted robustness estimation for some of the variables and found that the differences between the two models were marginal.

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<u>**Revision (Manuscript ID IJSE-04-2020-0212)**</u>

The authors sincerely appreciate the comments and suggestions made by the reviewers concerning our submission. As further described, the new manuscript contains the changes recommended by the reviewers, which certainly constitute an improvement to the former version of this work.

Reviewer 1

This paper researches the important question of the relationship between wellbeing and work among older people. The subject has particular relevance in the context of rising state pensionable ages and no default retirement ages. It is a potentially publishable paper.

However, some elements need further work.

The methodology overall is appropriate. It seems reasonable that employment is endogenous particularly for this age group and obviously age is related to employment. However, I do not think using age as an instrument is credible. At the very least you need to report on the lack of a correlation between age and wellbeing in the sample. You mention this result in the discussion but it needs to be better highlighted in the results. This is especially important given the mixed evidence you report in the literature review e.g. Lassale (2018).

Following the reviewer comment, we better highlighted this issue under the result section (page 13): "The estimated coefficients of a 2SLS regression model, in which …**Since our data revealed that no significant correlation could be found between age and life satisfaction for people aged 60-80 years old, the variable 'Age' served as IV**."

I think you are arguing that what matters more than age is health and wealth which is possible but needs to be proven and a lot will then depend on how good your measures of health and wealth are. Possibly a subjective measure of health is not sufficient as people can report their subjective health relative to their peers, older people expect to be less healthy. I know you use IADLs as your measure of health but these are self-reported. I would think given the importance of health in this context and also because you are using age as an instrument, it would be good to include a range of measures.

This comment is correct. When first analyzing the data, we used the variable "self-rated health" (with answers on a four-point Likert scale, ranged between 1=poor and 5= excellent). This explanatory variable, however, was found to be endogenous and subjective in its nature, compare to the IADL (Instrumental Activities of Daily Living) variable, which provides a much more objective health assessment of the respondent. The IADL variable involves specific questions about limitations with instrumental activities of daily living (such as preparing a hot

1

meal or working around the house or garden). We further clarified this point in the manuscript (page 10): "**The IADL variable is indeed self-reported. However, self-rated health has become a conventional measure of health status at the general population level. Self-rated health reflects an individual's integrated perception of health, and is known to incorporate various physical, mental and social aspects of health (Jylhä, 2009; Niedhammer *et al.*, 2013). This measure has been studied intensively in sociological health research, as well as in epidemiological and medical research due to its validity as predictor of both morbidity and mortality (Kaplan *et al.*, 1996; Idler and Benyamini, 1997; Jylhä, 2009; Risse *et al.*, 2014). Regarding IADL, it also provides an objective health assessment of the respondent, as it asks specific questions about limitations with instrumental activities of daily living (such as preparing a hot meal and working around the house or garden)**."

Are there no other possible instruments?

When analyzing the data, we could not find any other good instrument, other than 'Age', which would be correlated with the endogenous regressors but uncorrelated with the error term. As for age, our data revealed that no significant correlation could be found between age and life satisfaction for people aged 60-80 years old, but we did find a strong correlation with the endogenous explanatory variables, which ensures a strong first stage.

We better clarified this issue on page 3: "We used the variable 'Age' as an instrument variable (IV) since it has a strong correlation with the endogenous explanatory variables, which ensures a strong first stage."

And on page 17: "Our data revealed that no significant correlation could be found between age and life satisfaction for people aged 60-80 years old, and therefore 'Age' served as IV."

Does using IV make a difference to the results?

Yes, of course. When implementing a simple OLS model for the 'being employed' variable, had the opposite effect. Those who were employed were found to have a higher life satisfaction. However, we can't compare OLS and 2SLS coefficients, due to the endogeneity problem, as the OLS results show biased outcome.

The presentation for the economic model is not well done. The econometric model should come after the section on the Data. The norm is to present the estimated equation then discuss the dependent and independent variables. That would be a better approach.

Following the reviewer's comment, we presented the econometric model after the section on the Data.

There are not many included variables. This needs justification. Why only these variables? For example it could be important to include education and caring responsibilities or whether they live alone?

We agree with the comment. However, to simplify the model, we had to use general identification to represent many important variables, for example: X represents a set of personal characteristics such as health condition, education and marital status (which is highly correlated with the variable 'live alone'). As for the variable 'caring responsibilities', which is also important – unfortunately, we have no data about this variable in our dataset.

Why are the income variables not in estimation 1?

We use a structural model in which employment decision and income are endogenous variables. In the first stage, we estimate a reduced form of the equation, which explains the employment decision. We use this estimation as an instrumental variable for the second stage. Estimation of the structural model of employment decision is not our goal.

We further clarified this issue in the paper (page 9): "As Ei was endogenous, the 2SLS method was used. In the first stage, the following employment function …. **At this stage, we estimated a reduced form of the equation, which explains the employment decision**."

It is not clear what you are discussing when you say "In the next stage, we compared the following sub-groups with the employed group and found the following:...." Are you talking about the interaction effects in estimations 2 and 3.

Yes. We compare employees with a regular type of job (which is not physical, pressured or developing), and employees with a physical/ pressured/ developing job.

We better clarified this point (page 14):

"The main finding regarding the impact of employment on life satisfaction was that generally, for a regular type of job, which is not physical, pressured or developing – those who do not work enjoy a higher level of life satisfaction. In the next stage, we compared the **group of participants whose work is physical, pressured or developing** with the group employed **in a regular type of job**, and found the following:…"

3

What is a developing job exactly?

Developing job is a job that offers an opportunity to develop new skills. We clarified this point under the instruction (page 4) and the measures (page 11) sections.

Page 4: "we also look at the effect of the number of work hours and the nature of work (physically demanding, allow **an opportunity to** develop **new skills**, stressful) on older age SWB."

Page 12: "To examine the significance of the job, we created the variable 'Development' based on the answers to the question: "*I have an opportunity to develop new skills (Would you say you strongly agree, agree, disagree or strongly disagree?)*" Participants who replied 'strongly agree' or 'agree' were coded 1… "

The missings issue should not affect the gender interaction which I think could easily be in the first estimation.

Thank you for your comment. Indeed, the 'missing' issue should not affect the gender interaction. We added the variable "female" to the first stage, and the interaction term (Employed predicted X female) to the second estimation.

You should not really code missings as zero unless it is clear for some reason that missing means zero. This would need justification.

We have reasons to assume that some respondents whose work is not pressured may simply skip the question. In these cases, the correct value for the dummy variable is zero. The same holds for the other two characteristics: Physical job and developing job. However, we analyze the data with "missings" as zero and without missing data (for example, see table 4 column three and four) and results were quite similar.

Regarding the missings and interactions with job characteristics, are the large numbers of missings simply/mostly because these people are not working?

We address of this problem by using the variable "employed" in the interaction (see footnote b in Table 3). Page 30: "Due to missing values for those who are not employed, the actual value of the variable "employed" is used."

I think it would be better to estimate the equations with the interactions with work characteristics simply for those in employment. Then you do not need to interact. You would say, for those in work, job characteristics impact on wellbeing in the ways suggested by the results. The problem otherwise is all/most of the zeros are the same as the zeros for not working. probably these results would be equivalent to those in the last column. Then of course you might want to investigate selection.

Following the reviewer's comment, we estimated the equations with the interactions with work characteristics only for those in employment, using the dependent variable "Hours worked per week" (table 4). We did not do it when the dependent variable was "employed", because our main goal was to investigate the differences in SWB between those who were in employment and those who were not in employment. By separating these two groups, as suggested, we may miss the straightforward comparison.

Possibly by dealing with selection into employment (e.g. using a Heckman specification) this could mean you would not need 2SLS. Although I am not sure how you would do this and whether possible. But it deserves consideration as its selection that is probably driving the endogeneity.

Thank you for your comment. We considered this issue, but it turns out that our data, retrieved from the SHARE's questionnaires, did not include the data that is required to be used in the usual Heckman's procedures. For example, there are no data about job characteristics for individuals who are no longer employed.

In table 3 a variable name is missing in the first column, possible the pressure interaction?

Yes. We added the variable name: **Employed (predicted) X pressure** to the first column in Table 3

The whole document would benefit from editing for use of English

Further editing was carried out to the manuscript.

Additional Questions:

Originality: Does the paper contain new and significant information adequate to justify publication?: **Yes**

Relationship to Literature: Does the paper demonstrate an adequate understanding of the relevant literature in the field and cite an appropriate range of literature sources? Is any

significant work ignored?: **There could be a clearer link to previous research on older people and employment e.g. in relation to the understanding that employment participation declines with age and therefore the sample of those employed is likely to be very different from those not in work. This is implicit in the use of TSLS but a clearer link to previous research would be helpful.**

Following the comment, we clarified the link to previous research about older workers, their declining employment participation rates, and the different samples of those employed and those who have retired.

Page 5: "When older workers … Naturally, good mental and physical health are also needed to allow people beyond the age of 65 to continue working (Wahrendorf et al., 2017). **Thus, as employment participation rates decline with age (Axelrad, 2018), the sample of those who remained employed is likely to be very different from those who have retired (De Wind, et al., 2013, Axelrad, 2018).**"

Methodology: Is the paper's argument built on an appropriate base of theory, concepts, or other ideas? Has the research or equivalent intellectual work on which the paper is based been well designed? Are the methods employed appropriate?: **The methodology needs further justification and needs a clearer presentation.**

Following the comment, we added further justification for the methodology, and clarified its presentation.

Results: Are results presented clearly and analysed appropriately? Do the conclusions adequately tie together the other elements of the paper?: **The results need to be presented more clearly**

Following the comment, we clarified the result section's presentation. For example, we elaborated about the country dummies, and about the use of Age as IV.

Implications for research, practice and/or society: Does the paper identify clearly any implications for research, practice and/or society? Does the paper bridge the gap between theory and practice? How can the research be used in practice (economic and commercial impact), in teaching, to influence public policy, in research (contributing to the body of knowledge)? What is the impact upon society (influencing public attitudes, affecting quality of life)? Are these implications consistent with the findings and conclusions of the paper?: **This could also be clearer.**

6

We clarified the implications for research section. For example, on page 19, we added: "…Policy makers will be able to implement policy measures that can improve older workers' well-being. **As many older workers have to continue working, the policy of prolonged employment undervalues engagement in activities beyond employment, and neglects the potential risks for those who continue to work or are required to seek work (Taylor, 2019). Policy makers must take into account the potential well-being-enhancing effects of retirement, and search for ways to improve the SWB of those who stay in the labor market**."

Quality of Communication: Does the paper clearly express its case, measured against the technical language of the field and the expected knowledge of the journal's readership? Has attention been paid to the clarity of expression and readability, such as sentence structure, jargon use, acronyms, etc.: **Satisfactory overall. Some editing would be beneficial.** Further editing was carried out to the manuscript.

Reproducible Research: If appropriate, is sufficient information, potentially including data and software, provided to reproduce the results and are the corresponding datasets formally cited?: **yes**

Reviewer 2

The paper is well organized and clearly written.

The paper anlyses an important topic, covered by the IJSE - the association of employment at older age with life satisfaction. The investigation conducted contains important information namely in terms of social policy design.

The paper is well organized and reads well.

The methods and the results could benefit from a stronger spatial component that would also enrich the implications of the research, namely in terms of social policy design. Therefore, I would recommend a minor revision to the present version of this research.

Following the comment, we added a reference to the spatial component.

Additional Questions:

Originality: Does the paper contain new and significant information adequate to justify publication?: **The paper investigates an important topic that justifies publication: the association of employment at older age with life satisfation. The investigation conducted**

contains important information namely in terms of social policy design.

Relationship to Literature: Does the paper demonstrate an adequate understanding of the relevant literature in the field and cite an appropriate range of literature sources? Is any significant work ignored?: **The literarature review is complete and discusses dequately the main issues related to the topic under investigation.**

Methodology: Is the paper's argument built on an appropriate base of theory, concepts, or other ideas? Has the research or equivalent intellectual work on which the paper is based been well designed? Are the methods employed appropriate?: **The methodological framework is appropriate to the empirical study conducted. However taking into account that the dataset includes 18 countries, the analysis could benefit from the use a spatial analysis methodology.**

The current study included data from 18 European countries. In the analyses, we control for the country of residence to capture general influences like wars, natural disasters, and global problematic issues. Yet, when discussing results, we do not focus on the spatial issue. Following the comment, we added a reference to this issue.

Page 18: "**The current study included data from 18 European countries. Therefore, in the analyses, we controlled for the country of residence to capture general differences between countries in policies, regulations, and culture. However, in our analyses, we could not refer to all differences, as countries have implemented different mechanisms and policy measures to influence the pension system and effective retirement age. Some countries increased their official retirement age (e.g. Israel, Czech Republic, Estonia and France), changed the income and means testing rules of the pension system (France and Germany), changed contribution rates (Israel, Hungary), altered tax rules (France, Germany, Ireland and Israel) and changed the rules concerning early retirement (Austria and Germany) (OECD, 2017). Thus, future studies is required to explore country-based differences and implement a spatial analysis methodology. This analysis could be particularly important in terms of social policy design.**"

Results: Are results presented clearly and analysed appropriately? Do the conclusions adequately tie together the other elements of the paper?: **In line with the previous comment, the results could benefit from a detailed spatial analysis, by country or by sets of**

countries. This analysis could be particularly important in terms of social policy design, one of the aims of the results pointed out in the discussion section.

Following the reviewer's comment, we briefly referred to the country issue in the result section. Page15: "**As for countries' differences, Germany was used as a reference country, since it is the largest economy in Europe (Axelrad 2018). We found that respondents who live in Scandinavian countries (Sweden and Denmark) enjoy a higher level of life satisfaction compared to Germany, while those who live in former communist countries (like Poland, Estonia, Slovenia etc.) experience a lower level of life satisfaction compared to Germany**." Page 16: "**As for countries' differences, the same results were obtained regarding the impact of employment on life satisfaction**."

Implications for research, practice and/or society: Does the paper identify clearly any implications for research, practice and/or society? Does the paper bridge the gap between theory and practice? How can the research be used in practice (economic and commercial impact), in teaching, to influence public policy, in research (contributing to the body of knowledge)? What is the impact upon society (influencing public attitudes, affecting quality of life)? Are these implications consistent with the findings and conclusions of the paper?: **Yes, the paper cleaarly identifies the implications of the research conducted.**

Quality of Communication: Does the paper clearly express its case, measured against the technical language of the field and the expected knowledge of the journal's readership? Has attention been paid to the clarity of expression and readability, such as sentence structure, jargon use, acronyms, etc.: **The paper is well organized and clearly written.**