Workplace Perception and Job Satisfaction of Older Workers

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Abstract

This paper addresses the question to what extent workplace perception affects the subjective well-being of older workers in their jobs. We use several dimensions of workplace perception to estimate their importance for job satisfaction. Our results show that older workers' happiness in the job strongly depends on job rewards, in particular on opportunities to develop new skills, receiving support in difficult situations, and recognition for their work. These dimensions of workplace attributes are merely psychological by nature; in contrast, salary opportunities and socio-demographic dimensions have a weaker impact on job satisfaction, if at all.

Keywords Working conditions · Job-satisfaction · Related public policy · Non-wage labor costs · Benefits

JEL Classification J81 · J28 · J32

1 Introduction

The question how workplace perception relates to subjective well-being in the job is largely investigated, but not in particular for the older workforce. We study the impact of a selected set of self-perceived workplace variables on job satisfaction. This paper attempts to close this gap in the literature by identifying more psychological factors that increase or decrease happiness of older workers.

Legislature in many countries has identified the need for targeting policies to keep older workers in their jobs. Demographic shifts in the age distributions of developed countries have caused pension systems based on intergenerational redistribution to experience long-term financing issues. Early retirement and the lack of demand for older workers deteriorate the finances of pay-as-you-go pensions even more. While we know that factors like health and financial incentives are important considerations in the retirement decision, relatively few studies have dealt with the workplace perception as such and its influence on job satisfaction near retirement. The contemporary debate about increasing retirement

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ages often raises the subsequent question whether the design of workplaces can hold older workers in their jobs.

Studies have so far looked at the effect of retirement on subjective well-being; here, we take a different point of departure. Our contribution to this literature is the attempt to identify the factors of job satisfaction at pre-retirement age. To this end, we use a rich set of variables from the Survey of Health, Aging, and Retirement in Europe (SHARE). Dimensions of job satisfaction are self-reported and therefore subjective by nature; we use control variables including income and a variety of socioeconomic dimensions. The overall aim of this work is to micro-estimate the factors older workers consider important for their domain of job satisfaction.

We build upon the standard approach of estimating job satisfaction, proposed for instance by Clark and Oswald (1996). A rich set of workplace perception variables ameliorates the equations estimated in previous studies.

Our results show that older workers' degree of job satisfaction strongly depends on self-perceived workplace attributes, in particular on job rewards. Along with health, these attributes are main contributors to job satisfaction of older workers. Traditional job attributes seem to be of smaller importance, e.g., income, hours of work, and other sociodemographic descriptors.

We organize this paper as follows. Section 2 discusses the conceptual framework and literature on subjective well-being in relation to the older workforce, but also in general. Section 3 outlines the data and the empirical strategy. In Sect. 4, we present our results; Sect. 5 concludes.

2 Conceptual Framework and Related Literature

The term subjective well-being describes a person's evaluation of his or her experienced positive and negative affect, happiness or satisfaction with life (Frey and Stutzer 2002). In theory, these terms are separable constructs; however, many studies use them interchangeably since empirical findings suggest strong correlations between alternative satisfaction measurements, e.g., Bonsang and Klein (2012) or Fordyce (1988). Wealth or income, however, often serve as proxies for objective well-being, which can be measured cardinally. We may decompose overall subjective well-being into several dimensions or domains (Bonsang and Klein 2012); these domains typically include income, leisure time, one's social network, one's job, etc. Here, we narrow our focus on the domain of someone's job or workplace, often called job satisfaction in economics. We now discuss the most influential theories of occupational stress, bringing together economic and psychological approaches.

An important theory of work stress is the job demand-control model by Karasek (1979). Basically, workers face their job environment in two ways. On the one hand, they consider physical and mental demands. On the other hand, they appreciate the decision latitude or degree of autonomy their job allows. So, in a job environment with high demands and low decision latitude, job strain is experienced as rather high resulting in low levels of job satisfaction. In contrast, when job demands are high and the decision latitude is high as well, job control factors mitigate job demands.

A similar approach, the effort-reward model, also uses the antagonist attributes of a job in order to determine work stress and as a consequence job satisfaction (Siegrist et al. 2004). In this framework, work effort is measured by the dimensions physical and mental

burden and time pressure. Work rewards include financial remuneration, esteem of a job, career and promotion prospects, and job security. Hence, work stress depends on the balance between efforts and rewards.

Bakker and Demerouti (2007) extend these two approaches in their job demands-resources model. Job demands refer to those work aspects that require physical, emotional and cognitive efforts or skills. These might not necessarily have a negative impact on work stress, only when a job does not allow the employee to sufficiently recover from these efforts (Meijman and Mulder 1998). The moderating set of work aspects may be summarized as job resources that have a positive impact on motivation, for instance, support, autonomy, feedback, recognition and other organizational rewards.

We may also summarize these theories on work stress by using job demands and rewards. Hulin et al. (1985) and Judge and Watanabe (1993) define demands as the “pain” required to perform a job; these pains are moderated by the “pleasures” of a job or the job rewards. They define rewards as income, job security, advancement opportunities, a job being interesting, the promotion of diverse work styles, the opportunity to help people and being useful to society, and the relationship with management and colleagues. On the other hand, demands include education, working time, job intensity, physical effort and the probability of injury. In Table 1, we synthesize the aforementioned approaches into a framework suitable for the needs of our paper.

A similar categorization was used in the seminal paper by Sousa-Poza and Sousa-Poza (2000) which is helpful to our study in two ways. First, it recognizes the importance of workplace perception factors, either categorized as work-role inputs or as work-role outputs. Second, it demonstrates that job satisfaction considerably varies across countries, depending on the country-specific prevalence of input and output factors. They find that countries with high work-role outputs, in general, have higher job satisfaction scores on average.

The way economics authors have been modeling work stress leading to particular levels of job satisfaction is a simple utility function for a representative agent. Previous work, for instance by Hamermesh (1977), Freeman (1978) or Clark and Oswald (1996), provide the arguments in the utility function attached to someone’s workplace:

$$u_i = f(\mu, \rho, m, \bar{m}, 1 - l, \delta) \quad (1)$$

Function u represents a worker’s utility related to the workplace; m is the worker’s net wage, $\bar{m}$ with an overbar indicates their comparison wage, i.e., their position in the wage

Table 1 Job role in/outputs

Demands	Moderation mechanism
	Rewards
Education	Work independently ^a
Working hours	Skill development ^a
Physically demanding ^a	Support ^a
Time pressure ^a	Recognition ^a
	Prospects ^a
	Job security ^a
	Income
	Early retirement

^aSelf-perceived

distribution, l expresses the agent's normalized hours of work per week, δ is a vector of socioeconomic characteristics. Finally, μ and ρ are a vectors of self-perceived work role inputs (demands) and outputs (rewards), respectively.

Regarding the effect of income on happiness, there is an established empirical relationship that richer people on average report higher levels of satisfaction than poorer people (Blanchflower and Oswald 2004). The income subjective well-being relationship manifests at declining margins going from low to high income (Helliwell 2002). However, this relationship is not linear and does not hold under any circumstances. Psychological factors like individual autonomy were found to be more important for well-being than income (Fischer and Boer 2011). Moreover, the relative income hypothesis has received a lot of attention in labor economics. Stutzer (2004) points out that individuals' well-being depends on their relative levels of income rather than their absolute levels. In a direct empirical test, they find that higher income can *ceteris paribus* even reduce someone's utility, consistent with processes of adaptation and social comparison. We, therefore, include a variable for someone's position in the income distribution in the later empirical analysis.

In a dynamic setting, Easterlin (2001) developed the theory of subjective well-being over the life-cycle. He explains why satisfaction does not necessarily go up when income increases. Furthermore, Easterlin (1995) stresses that within a population, people with higher incomes are, on average, happier. However, raising the incomes of all does not increase the happiness of all. But how can we explain these paradoxical facts revealed in many surveys? The missing ingredient of economic theory is aspiration levels. People develop higher aspiration levels as income rises over the life-cycle. These norms or aspiration levels increase proportionally to income. The more income people can avail of the less happy people are with material or immaterial goods affordable with their past income level; aspirations increase. This aspiration effect works in the opposite direction of income increasing utility and might even mitigate it. The overall effect is, however, theoretically ambiguous, depending on the relative sizes of the two effects. In this paper, we test whether age might be used as a proxy for aspiration levels, since the level of aspirations as such remains latent.

Research on older workers' job satisfaction, for instance, Eichar et al. (1991) find that this population group considers autonomy in their job and a meaningful workplace as outstandingly important for their well-being. In fact, age differences are important for the way workplace characteristics are perceived. As Shultz et al. (2010) point out, the demand-rewards mechanism functions differently for younger versus older workers. While younger workers consider job demands as more important for their job satisfaction, older workers put a greater weight on reward factors. In the same line are the findings by Lee and Wilbur (1985); younger workers are particularly dissatisfied with the intrinsic characteristics of a job, for instance challenging work, work overload and pressure, use of skills. On the other hand, older employees report higher satisfaction with the job characteristics such as job security, promotion opportunities, and autonomy. This might reflect that older workers are better able to deal with the work "pains"; hence, autonomy and flexibility are of outstanding importance to them. Moreover, older workers might to a greater extent be able to select and focus on tasks that they do well, thereby mitigating negative demands (Abraham and Hansson 1995).

Regarding the general role of age on job satisfaction, Blanchflower and Oswald (2004) point out that subjective well-being is u-shaped over age, reaching a minimum around the age of 40. Therefore, we expect job satisfaction of older workers to increase in age, but again not in a linear way.

One aspect that makes older workers unique in the age distribution is the proximity to retirement. As Aristovnik and Jaklic (2013) point out, the degree of job satisfaction plays an important role in the decision to retire or to take part in the labor force. Also, older workers appreciate arrangements for early retirement on the job control side (Groot and van den Brink 1999). Abolhassani and Alessie (2013) find that unemployment has a strong negative impact on subjective well-being while voluntary retirement does as such not necessarily increase well-being. Also, overall well-being has an impact on retirement. Yet, reversing this chain of causality does empirically not hold. The findings by Bonsang and Klein (2012) go into the same direction; while retirement does not affect overall well-being, leisure satisfaction increases and income satisfaction decreases. For retirement policies, an important missing piece in this research agenda is an in-depth investigation of job demands and rewards and their implications on job satisfaction of workers at pre-retirement age.

On the side of labor demand, Taylor and Walker (1998) descriptively analyze employers' attitudes towards older workers. They find some evidence of ageism. In fact, employers often consider older workers to be inflexible and less able to perform physically burdensome tasks. Together with unhappiness in the job, employers' negative attitudes towards older workforce complement the literature on potential "push factors" into retirement [see for instance Preter et al. (2013)].

The empirical framework for the analysis in this study relies on the standard approach of multinomial ordered logit models. Ferrer-i Carbonell and Frijters (2004) use a fixed effects ordered logit model to estimate the effect of various variables on subjective well-being. They recommend using more personality variables often latent in the fixed effects.

3 Empirical Strategy

3.1 Econometric Model

We now turn to the discussion of the empirical strategy. First, we present the econometric model, then we discuss the data used for our study and the summary statistics. Finally, we clarify the expected outcomes in the estimates and the hypotheses they are based on.

We attempt to estimate the relationship of several dimensions of workplace perception to job satisfaction. To this end, a measurement for job satisfaction is needed that approximates a worker's utility in the workplace domain. The dependent variable is representing categories of response that exhibit a natural ordering, i.e., the degree of agreement with the survey question asking whether a worker is satisfied in his or her job. For this reason, the model is estimated as an ordered logit model. The continuous metric y_i underlying the categorical and ordered dependent variable is latent in this type of estimation model. The specification for the multinomial ordered logit model we use in this study is therefore as follows:

$$\begin{aligned}
 y_i &= \beta_1 \rho_i + \beta_2 \mu_i + \beta_3 x_i + \varepsilon_i \\
 \varepsilon_i &\sim F(z) = \frac{e^z}{1 + e^z} \\
 y_i &= \begin{cases} 1 & \text{if } y_i < c_1 \\ 2 & \text{if } c_1 \leq y_i < c_2 \\ 3 & \text{if } c_2 \leq y_i < c_3 \\ 4 & \text{if } c_3 \leq y_i \end{cases} \quad (2)
 \end{aligned}$$

The dependent variable in equations system (2) is y_i ; it is approximated by the observed variable *Jobsat*, an index reporting self-perceived job satisfaction. *Jobsat* embodies a worker's response to the following survey question:

Survey question All things considered, I am satisfied with my job. Would you say you strongly agree, agree, disagree or strongly disagree?

The possible answer categories which relate to each other in an ordered way follow the coding:

1. Strongly agree,
2. Agree,
3. Disagree,
4. Strongly disagree.

Vector ρ denotes workplace perception variables; x is a vector of controls including an agent's position in the income distribution, hours of work, age, sex, education, marital status, health, the number of kids, and the country of residence. Moreover, is an error term following a logistic distribution with the cumulative distribution function $F(z)$. Values of c are auxiliary parameters of the latent y_i . These "cutpoints" provide the link between the discrete categories of *Jobsat* and the corresponding portions of continuous y_i .

3.2 Data

For the empirical analysis, data from the Survey of Health, Aging and Retirement in Europe (SHARE) are used. Included are observations of waves 1, 2, and 4 in order to construct a panel of older workers, not yet retired, in the age interval 50 through 70. We include people reporting to be an employee or civil servant at the time of the interview. Interviews for wave one were conducted in 2004 and 2005, for wave 2 in 2006 and 2007 (Israel in 2009 and 2010), and for wave four in 2011 (Poland collected all interviews in 2012, in Germany, Estonia, and the Czech Republic, a minority of interviews are from 2010 and 2012). Wave 3 was designed to reconstruct work histories and is therefore not following the standard questionnaire of other waves. The panel is unbalanced, and therefore not every person is observed in all three waves. In fact, 59.9% of people are observed in one wave, 23.4% in two waves, and 16.7% in three waves. We also include Israel in the analysis, since the country has a similar socioeconomic system compared to Europe. In terms of data, Israel brings in 388 observations, i.e., 1.9% of the sample. In the key variables on workplace perception and sociodemographic variables, means from Israel are largely in line with the sample means.

We now discuss the ways we dealt with some shortcomings of the data. Several observations were not used due to missing values in key variables. From an inspection of the data, we conclude that these values are missing at random, so no imputations are attempted. In particular, we excluded observations in case job satisfaction was missing or unknown. Also, particular observations were excluded if the key variables of workplace perception were unknown or not reported or a valid entry for the propensity of early retirement was missing. Furthermore, observations with missing or unknown values for income percentile, gender, years of education, marital status, self-perceived health, and the number of children were excluded.

Having dropped non-reported or implausible observations, the resulting panel consists of 20,338 person-year observations originating from 16,289 individuals. The panel is rather comprehensive in terms of countries and sub-populations within countries. However, with respect to the time dimension, the panel has a maximum of three observations within a person. Due to the particular wave participation patterns, we use pooled rather than panel data estimators in the logit model specified above.

3.3 Summary Statistics

Next, we discuss summary statistics of all variables used. A description of all variables is reported in Table 2; the exact coding of the variables can be found in the appendix. The mean of the dependent variable *Jobsat* is 1.7, showing a skew of the distributions towards a higher satisfaction level.

Table 2 reports descriptive statistics for the sample used. For the self-perceived job attributes, we observe standard deviations for job role inputs to be greater than those for the job role output physical demanding. So, older workers seem to have quite a common take on the job controls and pressure, while the dispersion for physical demand indicates a greater diversity in perception. An additional variable related to one's employment is *ERet*, coded as a dummy. The underlying question for this variable is "Thinking about your present job, would you like to retire as early as you can from this job?" 44% of respondents answer this question with "yes" which seems to be quite a high share. Workers are on average in the 7th income percentile. Average working hours *WH* lie between 30 and 40 h per week.

The mean age of respondents is 56.2 years with the youngest respondents being 50 years old, the oldest are 70 years of age. The overall age distribution is right skewed with a skewness coefficient of 0.6. 51% of the sample is female, years of education are on average 12.5 years. The unordered categorical variable *Marital* represents a person's family situation, where a value of 1 means married and living together with a spouse, 2 means registered partnership, 3 is married, but living separated from a spouse, 4 is never married, 5 means divorced, and 6 is widowed. The largest portion of respondents, 74.2% report to fall into the first category. *Health* is self-reported health where 1 is excellent, and 5 means poor health. The mean health status 2.7 (skewness 0.02) may be interpreted as very good to good. Finally, the older workers in the sample have an average number of 2.1 children. In addition, the data set also includes a set of country dummies.

The main explanatory variables of self-perceived workplace attributes are constructed according to the degree of agreement to the following interview questions. The data provides us with the dimensions categorized in Table 1. There are four response categories for each variable, "strongly agree", "agree", "disagree" and "strongly disagree".

Table 3 shows the distributions of the dimensions. In summary, the majority of older workers in European does not work in physically demanding jobs; they show strong prevalence of autonomy in their work. Also, workers are able to develop new skills in their job. They receive support in difficult situations and recognition for their work. Job security is perceived as being high. On the other hand, workers seem to be pressurized and have poor prospects for job advancement. In terms of responses, 56.2% of observations report to disagree that their job was physically demanding, even 71.1% disagree that they had little freedom to decide how to do their work. 69.6% are in a situation where new skills may be developed, 75.8% receive support in difficult situations, and 69.7% the recognition they deserve. Concerning job security, 77.4% of observations report that their job is secure. Yet,

Table 2 Summary statistics

Variables	Description	Mean	SD	Min	Max
Dep. var.					
Jobsat	Job satisfaction index	1.662	0.658	1	4
Work role inputs					
Educ	Years of education	12.348	4.084	0	25
WH	Weekly hours of work	3.177	1.132	0	4
Phys	Job physically demanding	2.607	1.006	1	4
Press	Time pressure due to a heavy workload	2.485	0.874	1	4
Work role outputs					
Free	Little freedom to decide how I do my work	2.873	0.892	1	4
Develop	Opportunity to develop new skills	2.178	0.861	1	4
Support	Receive support in difficult situations	2.095	0.777	1	4
Recogn	Receive recognition for my work	2.207	0.808	1	4
Advance	Poor prospects for job advancement	2.138	0.87	1	4
Secure	Poor job security	3.031	0.86	1	4
Inc	Income decile	6.889	2.629	1	10
ERet	Look for early retirement: yes = 1, no = 0	0.447	0.497	0	1
Socioeconomics					
Age	Age at interview	56.164	3.933	50	70
Age2	Age squared/100	31.698	4.515	25	49
Sex	Gender dummy: female = 1, male = 0	0.514	0.5	0	1
Marital	Marital status	1.894	1.62	1	6
Health	Self-perceived health	2.655	0.988	1	5
Kids	Number of children	2.068	1.199	0	16
Countries					
Dummies for	Austria	0.049	0.216	0	1
	Germany	0.048	0.213	0	1
	Sweden	0.083	0.276	0	1
	Netherlands	0.074	0.261	0	1
	Spain	0.04	0.196	0	1
	Italy	0.047	0.211	0	1
	France	0.089	0.284	0	1
	Greece	0.032	0.177	0	1
	Switzerland	0.081	0.273	0	1
	Belgium	0.096	0.295	0	1
	Israel	0.019	0.137	0	1
	Czech Republic	0.086	0.28	0	1
	Poland	0.021	0.142	0	1
	Hungary	0.024	0.152	0	1
	Portugal	0.015	0.123	0	1
	Slovenia	0.019	0.138	0	1
	Estonia	0.083	0.275	0	1
	Denmark	0.095	0.293	0	1
	N		20,338		

Descriptive statistics are based on data from SHARE waves 1, 2 and 4

Table 3 Workplace perception variables, in percent of response categories

Variables	Strongly agree	Agree	Disagree	Strongly disagree
Work role inputs				
Phys	17.10	26.73	34.56	21.61
Press	14.91	32.52	41.73	10.83
Work role outputs				
Free	8.98	19.94	45.85	25.22
Develop	21.14	48.50	21.76	8.60
Support	20.35	55.42	18.64	5.59
Recogn	17.06	52.60	22.97	7.37
Advance	25.21	42.43	25.70	6.66
Secure	6.16	16.97	44.48	32.39

Descriptive statistics are based on data from SHARE, waves 1, 2 and 4

Fig. 1 Job satisfaction, means by country

67.6% of observations fall into the categories of “agree” or “strongly agree” with not having the prospects of promotion or advancement in their job. Almost half the observations, 47.4%, report constant pressure due to heavy workloads.

Another important issue is the variation of job satisfaction across countries. We observe in Fig. 1 the means of job satisfaction by country. Here, the numbers indicate that all of the countries receive a mean score between “agree” and “strongly agree” in response to the question whether someone was satisfied with one’s job. Yet, in a ranking of the strength of job satisfaction, there is a remarkable pattern going from highest in Northern- and Western

Europe to lowest in the Mediterranean and in the post-socialist countries. In this ranking, France and Israel are forming the borderline between the high and low satisfaction countries.

3.4 Hypotheses

The main focus of this paper is on workplace perception variables for which we now discuss the hypotheses about the signs on coefficient estimates hoped for. We would expect workplace the perception variables to have strong effects on job satisfaction. On the side of job demands or self-perceived work role inputs, we expect that *Phys* would reduce job satisfaction; a physically demanding job is a source of discomfort, for instance in case health deteriorating work environments are paired with a high degree of physical engagement required in production (negative coefficient). Also, an increase in time pressure *Press* should have a reducing effect on job satisfaction (negative coefficient). On the one hand, job controls or work role outputs should yield more job satisfaction as their extent increases. Developing new skills, receiving support in difficult situations, and getting recognition for one's work are likely to increase job satisfaction. On the other hand, little autonomy, poor career advancement opportunities, and poor job security are decreasing job satisfaction. In particular, this translates into positive coefficients for *Develop*, *Support*, *Recogn*, and negative coefficients for *Free*, *Advance*, and *Secure*.

4 Results

In general, all of the self-perceived job role inputs and outputs yield high magnitudes in the regression results; the majority of them is significant as well. The coefficient signs align to the hypotheses, with a few exceptions in some of the sub-categories and in case of *Phys*. Since coefficients in logit regressions do not have an intuitively meaningful interpretation, we discuss the results in terms of odds-ratios. As a reference for commenting on the magnitude of any estimate, we refer to the size of an effect in comparison to other covariates in our regression.

Overall, work role outputs are more dominant in their importance for job satisfaction compared to work role inputs. This confirms the previously discussed findings by Shultz et al. (2010) that job control is particularly crucial for older workers and less so for younger workers. The work role output factors *Develop*, *Support*, and *Recogn* receive high odds-ratios and high significance levels. Significance paired with moderately high odds-ratios become evident for *Free*, *Advance*, and *Secure*. The work role inputs *Phys*, *Press* are mixed in their results. In fact, *Phys* has an odds-ratio greater than one instead of the hypothesized opposite direction. As Siegrist et al. (2004) point out, physical load is a crucial stressor for blue collar workers, but not necessarily for white collar workers which nowadays dominate the workplaces. Hence, we should be cautious to interpret this particular result as a job being an “enjoyable challenge”. However, *Press* turns out—as we expected—to have a moderately negative and significant effect on *Jobsat* (Table 4).

In order to interpret the outcomes, let us go through an example of the logic applied. Consider the variable *Develop*; for its response categories, *Develop* has odds-ratios of 1.9 at response “agree” (value of 2), 2.7 at response “disagree” (value of 3), and 3.4 at response category “strongly disagree” (value of 4). So, when *Develop* goes from “strongly agree” to “agree”, the odds of *Jobsat* going down (from strongly agree = 1 towards strongly disagree = 4) are 1.9 times higher than the odds of *Jobsat* going up.

Table 4 Results ordered logit regression

Dependent variable:	Job satisfaction	Coefficient	Odds-ratio
Work role inputs			
<i>Educ</i>		0.00273 (0.63)	1.003 (0.63)
<i>WH</i>	$10 \leq WH < 20$	0.240** (2.42)	1.272** (2.42)
	$20 \leq WH < 30$	0.0786 (0.91)	1.082 (0.91)
	$30 \leq WH < 40$	0.0411 (0.53)	1.042 (0.53)
	$40 \leq WH$	-0.0404 (-0.55)	0.960 (-0.55)
<i>Phys</i>	agree	0.205*** (3.98)	1.227*** (3.98)
	disagree	0.144*** (2.81)	1.155*** (2.81)
	strongly disagree	0.0970* (1.65)	1.102* (1.65)
<i>Press</i>	agree	-0.244*** (-4.64)	0.784*** (-4.64)
	disagree	-0.317*** (-6.02)	0.728*** (-6.02)
	strongly disagree	-0.491*** (-6.53)	0.612*** (-6.53)
Work role outputs			
<i>Free</i>	agree	-0.166** (-2.35)	0.847** (-2.35)
	disagree	-0.343*** (-5.09)	0.710*** (-5.09)
	strongly disagree	-0.721*** (-9.86)	0.486*** (-9.86)
<i>Develop</i>	agree	0.648*** (13.67)	1.911*** (13.67)
	disagree	0.993*** (17.86)	2.700*** (17.86)
	strongly disagree	1.214*** (15.44)	3.367*** (15.44)
<i>Support</i>	agree	0.557*** (11.23)	1.745*** (11.23)
	disagree	0.954*** (15.92)	2.596*** (15.92)
	strongly disagree	1.409*** (14.38)	4.092*** (14.38)
<i>Recogn</i>	agree	0.779*** (14.49)	2.180*** (14.49)
	disagree	1.339*** (21.66)	3.815*** (21.66)
	strongly disagree	1.810*** (19.90)	6.109*** (19.90)

Table 4 (continued)

Dependent variable:	Job satisfaction	Coefficient	Odds-ratio
<i>Advance</i>	agree	0.0531 (1.23)	1.055 (1.23)
	disagree	−0.210*** (−4.29)	0.811*** (−4.29)
	strongly disagree	−0.295*** (−3.54)	0.745*** (−3.54)
<i>Secure</i>	agree	0.110 (1.36)	1.116 (1.36)
	disagree	−0.154** (−2.01)	0.857** (−2.01)
	strongly disagree	−0.500*** (−6.25)	0.607*** (−6.25)
<i>Inc</i>	2nd	0.0424 (0.41)	1.043 (0.41)
	3rd	−0.0954 (−0.98)	0.909 (−0.98)
	4th	−0.0311 (−0.34)	0.969 (−0.34)
	5th	−0.106 (−1.21)	0.899 (−1.21)
	6th	−0.145* (−1.71)	0.865* (−1.71)
	7th	−0.103 (−1.25)	0.902 (−1.25)
	8th	−0.0757 (−0.95)	0.927 (−0.95)
	9th	−0.0433 (−0.54)	0.958 (−0.54)
	10th	−0.157* (−1.93)	0.855* (−1.93)
		0.639*** (19.37)	1.895*** (19.37)
Socioeconomics			
<i>Age</i>		0.132 (1.38)	1.141 (1.38)
<i>Age2</i>		−0.136+ (−1.63)	0.872+ (−1.63)
<i>Sex</i>		−0.0166 (−0.51)	0.984 (−0.51)
<i>Marital</i>	reg.partnership	0.0674 (0.71)	1.070 (0.71)
	married, living separated	0.0662 (0.50)	1.068 (0.50)
	never married	0.0201 (0.31)	1.020 (0.31)
	divorced	0.0552 (1.07)	1.057 (1.07)
	widowed	−0.0704 (−0.87)	0.932 (−0.87)

Table 4 (continued)

Dependent variable:	Job satisfaction	Coefficient	Odds-ratio
<i>Health</i>	very good	0.213*** (3.98)	1.237*** (3.98)
	good	0.424*** (8.10)	1.528*** (8.10)
	fair	0.470*** (7.53)	1.599*** (7.53)
	poor	0.644*** (5.34)	1.904*** (5.34)
<i>Kids</i>		− 0.0375*** (− 2.71)	0.963*** (− 2.71)
Countries			
	Austria	− 0.130+ (− 1.43)	0.878+ (− 1.43)
	Germany	0.216** (2.42)	1.241** (2.42)
	Sweden	0.212*** (2.66)	1.236*** (2.66)
	Netherlands	0.482*** (6.21)	1.619*** (6.21)
	Spain	0.505*** (5.56)	1.657*** (5.56)
	Italy	0.269*** (2.91)	1.308*** (2.91)
	France	0.0522 (0.66)	1.054 (0.66)
	Greece	0.673*** (6.59)	1.960*** (6.59)
	Switzerland	− 0.174** (− 2.15)	0.840** (− 2.15)
	Belgium	0.00702 (0.09)	1.007 (0.09)
	Israel	0.483*** (3.55)	1.620*** (3.55)
	Czech Republic	0.127* (1.65)	1.135* (1.65)
	Poland	0.312*** (2.68)	1.366*** (2.68)
	Hungary	0.145 (1.17)	1.156 (1.17)
	Portugal	0.430*** (3.05)	1.538*** (3.05)
	Slovenia	0.276** (2.46)	1.318** (2.46)
	Estonia	0.671*** (8.12)	1.956*** (8.12)
	Denmark	Omitted	1

Table 4 (continued)

Dependent variable:	Job satisfaction	Coefficient	Odds-ratio
Cutpoints			
	c_1	4.666* (1.70)	
	c_2	8.236*** (3.01)	
	c_3	10.12*** (3.70)	
	N	20,338	20,338
	Log pseudo-likelihood	− 15,645.053	
	Wald chi2, 69 df	4735.86	
	Prob > chi2	0.0000	
	Correctly pred. outcomes	0.653	
	Pseudo R ²	0.1845	

z statistics in parentheses. (+), (*), (**), (***) indicate $p < 0.15$, $p < 0.10$, $p < 0.05$, $p < 0.01$, respectively. Marginal effects presented in Fig. 2

All odds-ratios are greater than one, therefore, job satisfaction increases as the degree of agreement with being “able to develop new skills” increases. Following this way of interpretation, we find that increasing job security *Secure* will increase job satisfaction. The same holds for job advancement *Advance*.

The other covariates are rather mixed in their magnitudes and significance. *Health* and *ERet* have quite a strong effect on job satisfaction, while working hours, kids and countries have moderate effects. Sex, education and marital status are insignificant predictors of job satisfaction. The effect of linear age turns out to be an insignificant predictors of job satisfaction; yet, the effect of *Age2* is in fact significant, but only at the 15% level and has a negative sign. The significance of the quadratic age estimate could serve as a confirmation of the u-shaped age-well-being relationship pointed out by Blanchflower and Oswald (2004). Increasing job satisfaction of older workers might reflect the enjoyment of their status of seniority and experience within a firm. Also, they might to a greater extent appreciate their work, because they are approaching retirement, a new phase bringing novel roles, increasing health issues and status insecurities to their lives.

With respect to income, we get significant odds-ratios at the middle and at the top of the income distribution, but not in between these thresholds. Therefore, going from the lowest decile to the middle or the top decile, job satisfaction increases, but in a nonlinear way.

Looking at the overall goodness of fit of the estimated model, the regression results imply a share of 65.3% correctly predicted outcomes compared to the overall number of observations.

Would this pattern of results for income and the non-significance of linear age in turn also hint at a support for the Easterlin (2001) paradox? We remember that increasing income and increasing aspiration levels over the life-cycle work in opposite directions, possibly resulting in a constant level of satisfaction. Regression results for most income deciles are insignificant. From this, we could infer—with all due caution—that a latent aspiration effect is driving this lack of significance. Also, the insignificant estimate of age as a proxy for aspiration level might be interpreted in the spirit of Easterlin. However, we

Fig. 2 Average marginal effects and their confidence intervals

think that two reasons speak against this thought experiment. First, in the age group 50–70, there is just no linear, but a quadratic relationship of age on job satisfaction. Job satisfaction increases over-proportionally with every additional year of age. Second, it may be the case that age can serve as a proxy for aspiration levels over a working life horizon, but not for the group of pre-retirement workers.

In order to better grasp the relative magnitudes of the effects, we now evaluate the average marginal effects (Fig. 2). Marginal effects for the country dummies are omitted for graphical reasons. In general average marginal effects represent the average percentage point change in the probability of a certain outcome of the dependent variable when one explanatory variable goes up from the base category “strongly agree” to a higher response category leaving all other variables at their actual values (Cameron and Trivedi 2005). Again, workplace perception variables have strong marginal effects.

Let us consider the variable *Develop* again. In case the dependent variable has the outcome “1”, a person strongly agrees to experience a high job satisfaction. When now the response for *Develop* goes from “strongly agree” to “agree”, the change in probability to report a high job satisfaction decreases by 12.4 percentage points. When *Develop* goes from “strongly agree” to “disagree”, the probability of having a high job satisfaction decreases by 18.8 percentage points. This demonstrates that *Develop* is a strong predictor of *Jobsat*. A majority of the workplace perception variables have significant marginal effects, and their magnitudes are great. As already discussed before, greater effects of work role outputs are opposed by smaller effects of work role inputs *ceteris paribus*. Still, workplace perception variables are overall big compared to the controls. Comparisons with other papers should be made with caution due to different coding of variables, regression methods and samples used. However, the marginal effects reported for instance by Sousa-Poza and Sousa-Poza (2000) exhibit quite similar magnitudes: 0.02 for “job physically demanding”; 0.04 for “job security”; 0.046 for “advancement opportunities”, or 0.06 for “work independently”.

Working hours have a significant, yet, small effect on job satisfaction; *Health* is a rather good predictor, and so is *ERet*. The country effects conform with the descriptive evidence that job satisfaction is on average lower in Southern and Eastern Europe compared to Northern- and Western Europe.

Fig. 3 Predicted probabilities

Finally, let us consider the whole range of response categories to self-perceived job factors. Figure 3 depicts the matrix of predicted probabilities of the four possible outcomes for job satisfaction at different response categories of the workplace perception variables while all other variables are at their means. Work role input factors and the work role output factor *Press* show considerable variations across the response alternatives. In contrast, *Phys* remains almost invariant to different levels of agreement. The probability that someone is very satisfied in their job is highest with approximately 60% for *Recogn* being very important. Reporting lower levels of agreement for *Recogn* lowers this probability which is intuitively plausible. The same pattern applies to *Develop* and *Support*. The probability of being just satisfied with one's job increases in the strength of non-agreement for these variables. The counterfactual situation that someone reports to (strongly) disagree with *Recogn* increases the probability of low job satisfaction. So, these work role output factors are strong predictors of job satisfaction.

For the more negatively connoted variables *Phys*, *Press*, *Free*, *Advance*, and *Secure*, the above pattern is reversed. Taking the example of *Free*, in case someone strongly agrees to have little decision latitude, the probability of very high work satisfaction is only about 30%. Growing autonomy increases this probability. Overall, predicted probabilities draw a plausible picture of the impact of workplace perception variables on job satisfaction. Furthermore, our results align with previous findings on older workers considering income, job security and advancement opportunities only moderately important for well-being in their job (Drabe et al. 2015).

5 Discussion and Conclusions

In the light of work demands and rewards, we summarize the outcomes for the self-perceived work attributes as follows: older workers need to balance work demands and rewards. On the demand side, time pressure is the most important stressor at work. If time pressure is high, workers will perceive their job as less satisfying. However, findings for younger workers suggest that time pressure is of even greater importance than for older workers.

Older workers try to moderate demands at work by a set of reward factors. Our results suggest that the main antagonists in the balancing mechanism are time pressure on the one hand and recognition, skill development and support in difficult situations on the other hand. Autonomy in the job is fundamental to mitigate demands, too. Compared to younger workers who still need to fine-tune the appropriate coping strategies for moderating demands, older workers appear to be more resilient to stressors. Therefore, older workers expect from their employer to offer an environment of autonomy in the job, feedback for merit and a job content being interesting enough to deploy the full range of their human capital. Due to their seniority, this age group might already possess higher degrees of autonomy at work.

SHARE offers a full set of workplace perception variables; however, we think there is an important limitation. In order to fully understand the mechanisms underlying the moderation of demands and rewards among workers, we would need the deep end of the dimensions of work stress and motivation that SHARE does not provide. For instance, time pressure might be broken down into sub-dimensions like “pressure to work over-hours”, “many interruptions and disturbances in job”, “unclear tasks assigned” or “not being able to switch off when coming home”. A second limitation concerns the idea that workers' aspiration levels change over time. We use age and quadratic age as a proxy for aspiration levels and find that job satisfaction increases in quadratic age. Yet, this does not directly allow

for an interpretation of quadratic age in the spirit of aspiration levels. More research will be needed to find a better way to capture the inherently subjective dimension “aspiration”.

Older workers—unlike their younger colleagues—perceive work role outputs as dominant in the demands-rewards balancing mechanism. For Human Resource management, this would suggest an increased awareness of age-related workplace needs. In order to allow workers to diversify their needs within the context of a firm, organizational features like bonuses, internal competitions, flexible working time, working from home arrangements, holiday arrangements and similar could be offered. This includes also to promote a workplace culture that appreciates a positive understanding of employees’ role across all levels, gives room for a diversity of work styles, initiative, special needs, and rewards outstanding achievement. Older workers in particular will value recognition and development opportunities and a high degree of decision latitude. Contrary to common opinion, older workers do not seem to be averse to new technologies and learning in general. This is substantiated by the rather strong predictors “new skill development” and “receive support in difficult situations”.

Compared to other control variables, perceived job role inputs and outputs show stronger effects on job satisfaction. Yet, disregarding the role of salaries in the overall employment package would certainly be a wrong advice for HRM practitioners. Indeed, workers on medium and high income are on average more satisfied with their jobs compared to workers on low income. We also found that job satisfaction increases with age even at rising margins, so the very old employees might be considered a particularly precious resource of companies. Another relevant indicator for job dissatisfaction in the older workforce is also the pursuit of early retirement.

Country differences in overall job satisfaction do exist throughout Europe at clear geographical boundaries. In fact, workers in Eastern and Southern Europe experience lower levels of job satisfaction than their colleagues in Northern and Western Europe and the boundary country between these very clearly separable groups is France. We may speculate that this finding stems from different levels of development in many aspects of industrial relations, such as technology or work cultures. Also, work role output factors might structurally be developed stronger in Northern and Western Europe, and demands more prevalent in Southern and Eastern Europe.

This study attempted to conjoin approaches from economics and occupational psychology in an important policy question for aging societies. Higher job satisfaction propagates better outcomes at all levels of an organization. It is therefore crucial for employers to understand that the needs of their workforce not only differ by function within a firm, but also by age. Corporate scope frequently confines itself to tangible outputs. In this paper, we wanted to steer attention to the importance of the “soft factors”.

Workplace perception is important to older workers, in particular, the dimensions of the ability to develop new skills, support in difficult situations, as well as the recognition someone receives for their work. Income opportunities, working hours, age, gender, and marital status seem to play minor roles in older workers in the domain of job satisfaction. We analyzed a contemporary large dataset on pre-retirement workforce including individuals from most European countries. Only health, the number of children and the country someone is living in play an important role along with workplace perceptions in the determination of the degree of job satisfaction.

For policies aiming at holding older workers in the job, workplace perception factors are key triggers in order to increase job satisfaction. Some of these factors are feasible areas for policy changes, some may not be influenced by policy at all. Since the nature of workplace perception variables is more psychological, the transmission of policies targeting the micro levels of the firm and their workers is difficult to accomplish.

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Compliance with Ethical Standards

Competing interest The authors declare not to have conflict of interest of any kind.

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Appendix

The following list gives the exact coding of all variables used in the analysis:

Dependent Variable

Job satisfaction index: categorical, 1 = strongly agree, 2 = agree, 3 = disagree, 4 = strongly disagree.

Work Role Inputs

Years of education: integer

Weekly hours of work: categorical variable, 0 in [0,10[, 1 in [10,20[, 2 in [20,30[, 3 in [30,40[, 4 if 40 or above

Job physically demanding: categorical, 1 = strongly agree, 2 = agree, 3 = disagree, 4 = strongly disagree

Time pressure due to a heavy workload: categorical, 1 = strongly agree, 2 = agree, 3 = disagree, 4 = strongly disagree.

Work Role Outputs

Little freedom to decide how I do my work: categorical, 1 = strongly agree, 2 = agree, 3 = disagree, 4 = strongly disagree

Opportunity to develop new skills: categorical, 1 = strongly agree, 2 = agree, 3 = disagree, 4 = strongly disagree

Receive support in difficult situations: categorical, 1 = strongly agree, 2 = agree, 3 = disagree, 4 = strongly disagree

Receive recognition for my work: categorical, 1 = strongly agree, 2 = agree, 3 = disagree, 4 = strongly disagree

Poor prospects for job advancement: categorical, 1 = strongly agree, 2 = agree, 3 = disagree, 4 = strongly disagree

Poor job security: categorical, 1 = strongly agree, 2 = agree, 3 = disagree, 4 = strongly disagree

Income decile: categorical variable, 1 if first decile, ..., 10 if 10th decile

Look for early retirement: categorical, yes = 1, no = 0.

Socioeconomic Variables

Age at interview: linear age; real number

Age2: Age squared/100

Sex: female = 1, male = 0

Marital status: categorical, 1 = married and living together with spouse, 2 = registered partnership, 3 = married, living separated from spouse, 4 = never married, 5 = divorced, 6 = widowed

Self-perceived health: categorical, 1 = excellent, 2 = very good, 3 = good, 4 = fair, 5 = poor

Number of children: integer.

Country Dummies

Yes = 1, no = 0 if observation comes from one of the following countries:

Austria, Germany, Sweden, Netherlands, Spain, Italy, France, Greece, Switzerland, Belgium, Israel, Czech Republic, Poland, Hungary, Portugal, Slovenia, Estonia or Denmark.

References

- Abolhassani, M., & Alessie, R. (2013). Subjective well-being around retirement. *De Economist*, 161(3), 349–366.
- Abraham, J. D., & Hansson, R. (1995). Successful aging at work: An applied study of selection, optimization, and compensation through impression management. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, 50(2), 94–103.
- Aristovnik, A., & Jaklic, K. (2013). *Job satisfaction of older workers as a factor of promoting labour market participation in the EU: The case of Slovenia*. MPRA paper. University Library of Munich, Germany.
- Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of Managerial Psychology*, 22(3), 309–328.
- Blanchflower, D. G., & Oswald, A. J. (2004). Well-being over time in Britain and the USA. *Journal of Public Economics*, 88(7–8), 1359–1386.
- Boersch-Supan, A., Brandt, M., Hunkler, C., Kneip, T., Korbmacher, J., Malter, F., et al. (2013). Data resource profile: The survey of health, ageing and retirement in Europe SHARE. *International Journal of Epidemiology*, 42(4), 992–1001.
- Bonsang, E., & Klein, T. (2012). Retirement and subjective well-being. *Journal of Economic Behavior and Organization*, 83(3), 311–329.

- Cameron, A. C., & Trivedi, P. K. (2005). *Microeconometrics: Methods and applications*. Cambridge: Cambridge University Press.
- Clark, A. E., & Oswald, A. J. (1996). Satisfaction and comparison income. *Journal of Public Economics*, 61(3), 359–381.
- Drabe, D., Hau, S., & Richter, N. F. (2015). Job satisfaction in aging work-forces: An analysis of the USA, Japan and Germany. *The International Journal of Human Resource Management*, 26(6), 783–805.
- Easterlin, R. A. (1995). Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior and Organization*, 27(1), 35–47.
- Easterlin, R. A. (2001). Income and happiness: Towards a unified theory. *The Economic Journal*, 111(473), 465–484.
- Eichar, D. M., Norland, S., Michael Brady, E., & Fortinsky, R. H. (1991). The job satisfaction of older workers. *Journal of Organizational Behavior*, 12(7), 609–620.
- Ferrer-i Carbonell, A., & Frijters, P. (2004). How important is methodology for the estimates of the determinants of happiness? *The Economic Journal*, 114(497), 641–659.
- Fischer, R., & Boer, D. H. R. (2011). What is more important for national well-being: money or autonomy? A meta-analysis of well-being, burnout, and anxiety across 63 societies. *Journal of Personality and Social Psychology*, 101, 164–184.
- Fordyce, M. W. (1988). A review of research on the happiness measures: A sixty second index of happiness and mental health. *Social Indicators Research*, 20(4), 355–381.
- Freeman, R. B. (1978). Job satisfaction as an economic variable. *American Economic Review*, 68(2), 135–141.
- Frey, B. S., & Stutzer, A. (2002). What can economists learn from happiness research? *Journal of Economic Literature*, 40(2), 402–435.
- Groot, W., & van den Brink, H. M. (1999). Job satisfaction of older workers. *International Journal of Manpower*, 20(6), 343–360.
- Hamermesh, D. S. (1977). *Economic aspects of job satisfaction. Essays in labor market analysis* (pp. 53–72). New York: Wiley.
- Helliwell, J. F. (2002). *How's life? Combining individual and national variables to explain subjective well-being*. NBER working papers 9065, National Bureau of Economic Research, Inc.
- Hulin, C. L., Roznowski, M., & Hachiya, D. (1985). Alternative opportunities and withdrawal decisions: Empirical and theoretical discrepancies and an integration. *Psychological Bulletin*, 97(2), 233–250.
- Judge, T. A., & Watanabe, S. (1993). Another look at the job satisfaction-life satisfaction relationship. *Journal of Applied Psychology*, 78(6), 939–948.
- Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 24(2), 285–308.
- Lee, R., & Wilbur, E. R. (1985). Age, education, job tenure, salary, job characteristics, and job satisfaction: A multivariate analysis. *Human Relations*, 38(8), 781–791.
- Meijman, T., & Mulder, G. (1998). Psychological aspects of workload. In P. Drenth, H. Thierry, & C. de Wolff (Eds.), *New handbook of work and organizational psychology: Volume 2: Work psychology* (pp. 5–34). New York: Psychology Press.
- Preter, H. D., Looy, D. V., & Mortelmans, D. (2013). Individual and institutional push and pull factors as predictors of retirement timing in Europe: A multilevel analysis. *Journal of Aging Studies*, 27(4), 299–307.
- Shultz, K. S., Wang, M., Crimmins, E. M., & Fisher, G. G. (2010). Age differences in the demand control model of work stress: An examination of data from 15 European countries. *Journal of Applied Gerontology*, 29(1), 21–47.
- Siegrist, J., Starke, D., Chandola, T., Godin, I., Marmot, M., Niedhammer, I., et al. (2004). The measurement of effort reward imbalance at work: European comparisons. *Social Science and Medicine*, 58(8), 1483–1499.
- Sousa-Poza, A., & Sousa-Poza, A. A. (2000). Well-being at work: A cross-national analysis of the levels and determinants of job satisfaction. *Journal of Behavioral and Experimental Economics (Formerly The Journal of Socio-Economics)*, 29(6), 517–538.
- Stutzer, A. (2004). The role of income aspirations in individual happiness. *Journal of Economic Behavior and Organization*, 54(1), 89–109.
- Taylor, P., & Walker, A. (1998). Employers and older workers: Attitudes and employment practices. *Ageing and Society*, 18(06), 641–658.