A Web Survey Analysis of the Subjective Well-being of Spanish Workers[1]

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ABSTRACT

This paper makes use of a large sample of individual data obtained from web surveys in the WageIndicator project. Data includes extensive information on the quality of working conditions together with different well-being indicators. The paper emphasizes the role of work-related characteristics as a specific and very important aspect of life. In our analysis, we demonstrate the role of working conditions in the following three domains: overall life-satisfaction; satisfaction with one's job; and satisfaction with the combination of family and work. The paper also contributes to the ongoing debate on web survey data quality, reliability, and validity for scientific use. It demonstrates how social sciences can benefit from the use of web survey data in order to overcome the limits of traditional information sources.

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1. Introduction

According to Frey and Stutzer (2010), the research of subjective well-being (SWB) should remain open to constructing different indicators for different aspects of life. The research on SWB, despite examining very broad areas, tends to explore the role of working conditions in job satisfaction models, but neglects the importance of work related variables in other domains of SWB. In developed countries, employed individuals spend on average one-third of their time each day at the workplace. Working conditions and preferences towards employment therefore constitute the most significant determinants of SWB, but the available evidence is scarce, particularly due to data availability. The relationship between different aspects of working conditions and SWB remains undiscovered also because traditional surveys are limited in the scope of the survey questionnaires and the number of questions related to working conditions is restricted. Moreover, surveys including well-being indicators typically do not permit SWB analysis at the country level, mainly due to the small sample sizes.[2] Empirical studies mostly rely on samples by pooling observations of all available countries. Indicators obtained from cross-country analysis cannot adequately capture the well-being of an entire nation and therefore, findings have limited use in national policy making. This paper offers an alternative to those limits by making use of a large sample of individual data collected in the WageIndicator (WI) project. Data is obtained from web surveys[3] and includes extensive information on the quality of working conditions together with several SWB indicators. The goal of the paper is twofold ─ applied and methodological. First, the paper emphasizes the role of work related characteristics as a

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[2] Few countries collect data in large numbers that are suitable for studying life-satisfaction determinants (e.g. Germany, United Kingdom, USA and Australia). International evidence often relies on the European Social Survey, Eurobarometer and the World Values Surveys (Leuchinger, Meier and Stutzer, 2010).

[3] In the text, we refer to the web surveys if the sample is obtained from questionnaires posted on Internet. Traditional surveys refer to surveys conducted by phone or face-to-face interviews in which participants are randomly selected.

specific and very important aspect of life. In our analysis, we demonstrate the role of working conditions in the different domains of SWB. Second, the paper contributes to the debate on web survey data quality, reliability, and validity for scientific use. It demonstrates how social sciences and SWB research can benefit from the use of web survey data in order to overcome the limits of traditional sources of information.

The paper is organized as follows. In Section 2, we discuss the advantages and disadvantages of data obtained from web surveys. We explain how the quality of data can be tested and we discuss methodological solutions. Section 3 presents the findings from SWB literature with a particular focus on the role of working conditions and the Spanish population. Section 4 introduces the data used in the analysis. In section 5, we discuss the role of individual characteristics and the quality of working conditions in the different domains of well-being. We confirm that results from the WI sample match remarkably well to those obtained from probabilistic surveys, especially after calibrating the WI sample using a propensity score weighting technique. We provide more evidence of data reliability and new conclusions on work related variables not widely presented in the SWB literature. Section 6 concludes our analysis.

2. The advantages, disadvantages and solutions for web-survey data.

Today, people are used to conducting many of their daily activities via the Internet. The use of online services and mobile devices has gained a lot of popularity. This behavior generates a lot of information, but also allows for a new channel of data collection. Reips (2006) defines the four methods of web data collection: non-reactive data collection; web-based experimenting; web-based testing; and web-surveying. In this paper, we exploit data obtained through a Continuous Voluntary Web Survey (CVWS). This type of web survey has become a very attractive tool as it allows access to

respondents at a lower cost and larger numbers relative to traditional surveys that are conducted via phone, mail, or on a face-to-face basis. The analysis based on web survey data triggered a debate about the external validity of the findings. Both the strengths and weaknesses of web surveys have been discussed extensively in literature (e.g. Couper, 2000; Fricker and Schonlau, 2002; Groves, 2004; Honing and Reips, 2008; Musch, Bröder, and Klauer, 2001; Taylor, 2000; Tuten, Urban, and Bosnjak, 2000). Arguments in favor of web surveys emphasize cost benefits, the speed of data collection in large numbers, the flexibility of questionnaire design, and the potential to reach respondents across national borders, enabling multi-country, multilingual, and quasi-global homogenized surveys. Arguments against web surveys name survey errors common to all surveys, such as errors related to sampling, non-coverage, non-response and measurement (e.g. Dillman and Bowker, 2001). In the case of CVWS, the resulting sample is not obtained randomly, the coverage is lower among groups without access to the Internet (coverage error) and the sample only includes web visitors who respond to the questionnaire (non-response error). As a result, researchers have tested the quality of web surveys and are developing ways to improve them. The most common procedure is to test data by benchmarking them against data from the labor market; or by demonstrating the ability to empirically corroborate theoretical models. Pedraza, Tijdens, Bustillo and Steinmetz (2010) show that estimates obtained from a standard wage regression using the Spanish WI sample are comparable to those obtained from the Spanish Structure of Earnings Surveys. Bustillo and Pedraza (2010) empirically confirm a theoretical job insecurity model for five European countries using WI web survey data.

In order to improve the representativeness of web surveys, two approaches have been followed (Couper and Miller, 2009). First, the "design-based" approach attempts to

build a probability web survey by applying other modes for sampling (e.g. running a paper survey targeted at groups not presented in the sample), recruitment, or by providing Internet access to those individuals without it (De Leeuw, 2008; Scherpenzeel and Das, 2010). Second, the "model-based" approach attempts to correct the bias of web surveys by applying weighting techniques (e.g. Bethlehem and Stoop, 2007; Lee and Valliant, 2009; Loosvedt and Sonck, 2008; Schonlau, Soest, Kapteyn and Couper, 2009). This approach was proven effective in the analysis based on WI data (Pedraza Tijdens, Bustillo and Steinmetz, 2010).

Empirical research based on web data is receiving increasing attention in economic literature. In this paper, we test the quality of data obtained from web surveys by benchmarking it with a representative sample of the Spanish population. We construct propensity score weights to correct the sample by using the Spanish Labor Force Surveys based on gender, education, age cohorts, and region categories. In the analysis, we present descriptive statistics (Section 4) and then we show the quality of data in a regression framework (Section 5). Ultimately, we compare our estimates with findings presented in the SWB literature to further demonstrate the scientific validity of the WI sample. In the conclusion, we outline future research possibilities and encourage researchers to take advantage of exploring data collected from alternative sources.

3. An overview of SWB literature

The research of subjectively reported measures has been receiving attention over the last two decades. Kahneman and Krueger (2006) demonstrate that the validity of SWB can be assessed, in part, by identifying their correlations with other characteristics of individuals. Many studies conclude that although subject to many caveats, SWB measures complement traditional welfare analyses and their findings can be taken into

consideration when formulating economic policy (Layard, 2005). Face-to-face surveys are limited in the number of observations per country and therefore, researchers typically perform SWB analysis by pooling the observations of more countries. Oswald (2002) uses 1996 Eurobarometer surveys to demonstrate the effect of some important job characteristics, such as occupation, hours of work, job security, trade union affiliation and commuting time to work on job satisfaction in European countries. Drobnic, Beham and Prag (2010) study the link between different parameters of job quality and overall life satisfaction using the 2003 European Quality of Life Survey. Job insecurity and having a boring job are identified as major negative factors to life satisfaction. In general, the authors discovered that the impact of working conditions on life satisfaction is stronger in Southern and Eastern European countries relative to Western European countries. The estimates from separate country regressions show low statistical power to corroborate the general findings, mainly due to the small sample size. In 1999, the Spanish Ministry of Labor and Social Affairs initiated the Quality of Working Life Survey (ECTV).[5] It is an annual representative survey of Spanish workers that collects information on labor relations and the quality of life in the workplace. The survey provides a reasonable sample size, but does not permit longitudinal analysis. Namkee (2007) uses the ECVT from 1999-2004 to examine the relationship between job characteristics and workers' satisfaction with life and job. The analysis concentrates on the effect of intangible job characteristics such as work flexibility, independence, social contacts, trust in superiors, and a pleasant and low-stress work environment. Namkee evaluates that the combined effect of intangible job characteristics on life-satisfaction is larger than doubling an individual's wage. Burón (2009) estimates job satisfaction regression using the 2004 ECVT to identify the negative effect of long-

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[5] For more details, see http://www.empleo.gob.es/estadisticas/ecvt/welcome.htm

working hours, long commutes, over-qualification, and previous unemployment experience. He finds that job stability, good relationships at the workplace and a pleasant working environment are positively related to job satisfaction.

In general, the empirical evidence on SWB confirms that the quality of working conditions is important. In this paper, we contribute to the literature by exploring data obtained from a CVWS, testing whether the above findings are corroborated by the web survey.

4. Data and summary statistics

4.1 WageIndicator web-surveys

The analysis is based on data collected from a web survey posted at www.tusalario.es - the Spanish website of the WageIndicator project. Every web-visitor is invited to complete a web-survey, which takes 10 to 20 minutes. The survey has detailed questions about earnings, benefits, working conditions and employment contracts, as well as questions about education, occupation, industry, and household characteristics. Most importantly, the survey includes questions inquiring about the level of satisfaction in different domains such as life, job, and the combination of family and work. Detailed information about the WI project, the web survey characteristics, the questionnaire and a description of variables can be found in Tijdens, Zijl, Williams, Klaveren, Steinmetz (2010). In this paper, we make use of information on more than 20,000 individuals who completed the questionnaire between 2005 and 2011 (see Table 5 for the description of questions). In order to correct the representativeness of the WI sample, we calculate propensity score adjustment weights following Pedraza, Tijdens, Bustillo and Steinmetz (2010). The weights are calculated based on gender, age, education and Spanish regions using Spanish Labor Force Surveys as the reference sample.

4.2. The European Social Survey

In order to test the data quality of the WI sample for SWB analysis, we make use of the European Social Survey (2013) (ESS), a traditional probability survey[6]. The ESS interviews all respondents on a face-to-face basis[7] and is representative of the Spanish population. The ESS cumulative data file includes information from four waves conducted between 2004 and 2011. Importantly, the survey includes relevant information on individual and household characteristics, work conditions and SWB. The desirable time coverage and representativeness makes the ESS a suitable dataset to compare with the WI sample. ESS is commonly used to study life-satisfaction in the European context (e.g. Caporale, Georgellis, Tsitsianis and Ping, 2009; Clark and Senik, 2010; Betz and Simpson, 2013) or in Spain (e.g. Cunado and de Gracia, 2012).

4.3. Summary statistics

Table 1 shows the time frame of the survey data used in the analysis. The samples are limited to employed individuals 15 to 64 years old and to observations with complete information. As discussed above, the main advantage of the WI sample is that it is being collected continuously and in substantially larger numbers relative to traditional surveys like the ESS (there are 3,445 observations in the ESS compared to 20,095 in the WI sample). The sample characteristics of both surveys are presented in Table 2. In Column 2, we present the WI sample after implementing propensity score adjustment weights while Column 3 shows statistics of the WI sample without weights. If the ESS sample is taken as representative of the Spanish population, then highly educated and younger participants are overrepresented in the WI sample. This is because the WI website is mostly visited by young workers with higher levels of education who are seeking information about wages. Naturally, some discrepancies between the WI and ESS

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[6] The ESS 1-5 cumulative file provided by the Norwegian Social Science Data Services, Norway – Data Archive and distributor of ESS data.

[7] Based on an ESS documentation report, the average response rate in Spain was about 65% in all waves.

samples can be attributed to the lower amount of Internet accessibility among older people. Importantly, it is observed that the weights are effective in moving the estimated mean of the WI sample closer to that of the population. Some sample characteristics like the share of females or the share of foreign-born workers are very similar in both samples. In contrast, self-employed workers are largely underrepresented in the WI sample. The comparison further reveals that respondents in the WI sample report a substantially lower satisfaction with life. It is suggested by surveyors that information provided in self-administered questionnaires is more reliable than interviewer-assisted surveys, especially when questions intrude on sensitive or private matters (notice also the differences in reported general health status). In the next section, we contrast the quality of the WI sample with that of the ESS in the life-satisfaction regression framework.

5. Estimation and results

5.1 A comparison of the WI and ESS samples in the life-satisfaction model

The measure of individual well-being used here is the answer to the question, "How satisfied are you with life as a whole?" Possible answers in both the ESS and WI surveys are presented on a ten-point scale from 1 to 10 where 1 is "Not satisfied at all" and 10 "completely satisfied".[8] In the analysis, we follow the literature regarding the dependent variable definition, model specifications and estimation methodologies. Given the nature of the dependent variable, the ordered logit model is the appropriate estimation technique. Ferrer-i-Carbonell and Frijters (2004) show that OLS estimates when treating the aggregated answers as a continuous variable are very similar. We estimate the life-satisfaction model including generally accepted determinants from

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[8] The scale in the ESS ranges from 0 to 10, and therefore zeros are replaced with ones (0.6% of the cases). This change does not alter the main findings.

well-being literature that are available in both surveys. Table 3 presents estimates for the ESS sample (Column 1), for the WI sample with weights (Column 2) and without weights (Column 3). In general, the estimates are consistent with the findings presented in the literature (e.g. Frey and Stutzer, 2002). The most important factors are marital status, age, and income, which all are identified to have a significant relationship and estimated with the expected sign in both samples. The income variable is a prominent variable in the life-satisfaction models and a positive association is found between the two variables. The measure of income variable is not compatible between surveys. Therefore, marginal effects cannot be compared.[9] We identify a particularly strong impact of health variables, with decreased health status leading to a sharp drop in well-being. Yet few differences are observed between the ESS and WI samples. The estimate on dummy variables for divorced individuals is negative in the ESS sample and is not confirmed in the WI sample. While the representativeness of the WI sample can be a concern, it is shown that estimates from the WI sample exhibit very similar patterns to the estimates from the ESS sample. Furthermore, estimates from the WI sample with weights are closer to ESS estimates with the significance of estimates remaining unchanged. Therefore, in subsequent analysis, we rely on the WI sample with weights. In the next section, we continue the analysis by exploring different domains of SWB and by expanding the set of determinants that is not possible to perform with ESS data.

5.2. SWB and the role of personal characteristics

We conduct the analysis to achieve three goals. First, we compare the estimates on personal characteristics from the WI sample to the findings generally accepted by literature. Second, we discuss the stability of estimates when the set of objective

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[9] Information on net monthly income is provided at the household level in the ESS, and is banded into eleven categories. In the regressions, we include log income calculated using the mid-point of each income bracket (the same approach is adopted in Clark and Senik (2010) and Betz and Simpson (2013)). The WI sample includes information on individual gross monthly income.

working conditions and the subjective evaluations of work are included in the model. Finally, we discuss the role of individual characteristics in the different domains of well-being such as satisfaction with life, satisfaction with job, and satisfaction with the family and work balance. To demonstrate the importance of working conditions, we first estimate a baseline model including standard personal and family characteristics and then we expand the model to include the wide spectrum of working conditions. All models include regional and year fixed effects and Table 4 presents the estimates. In the following paragraphs, we discuss the findings with respect to results commonly presented in the literature.

Health status

Individual health status is ranked as one of the most valued aspects in people's lives (OECD, 2012). It enhances people's opportunities to participate in the labor market as well as allowing them to have good social relationships. Peiró (2006) and Caporale et al (2009) confirm a robust relationship exists between health and SWB in cross-country analyses. The WI sample estimates imply that self-reported individual health status is being identified as a very strong predictor in all domains of SWB. Moreover, it is worth noting that the magnitude of health variables changes only slightly when working conditions are added to the model.

Income and wealth

Personal income and wealth are essential components of individual well-being. Income allows people to satisfy their needs and pursue their goals while wealth helps to sustain it over time. Jobs with high pay are often characterized by better working conditions. Not surprisingly, when working conditions are included, the estimated coefficient on income variable substantially decreases. The pattern is more pronounced in the job satisfaction model where the estimate on income declines to one-third of the magnitude.

Personal income is not associated with satisfaction with the family and work balance in the baseline model. Estimates from the model with working conditions imply it is more difficult to combine family and work for high-income workers. Home ownership is used as a proxy for wealth. This variable exhibits a positive correlation to life-satisfaction and satisfaction with the family and work balance.

Occupational prestige

Job prestige refers to the admiration and respect that a particular occupation holds in a given society. Occupational prestige is measured by an index with 0 being the lowest possible score and 100 being the highest and is independent of the particular individual who occupies a job.[10] Estimates imply that workers employed in a prestigious occupation report higher life-satisfaction, but the effect is mitigated and disappears when work characteristics are controlled. The satisfaction with the family and work balance shows no relationship to job prestige. As expected, a robust and positive relationship is observed between occupational prestige and job satisfaction.

Self-employment

The Spanish labor market is generally characterized by a high percentage of self-employed workers. According to the Spanish Labour Force Survey, self-employment represented 16 per cent of the total working population in Spain in 2011. Unfortunately, the number of self-employed in the WI sample is very low (less than 1 per cent). Despite their low number, the self-employed are identified to report higher satisfaction with their job relative to employed workers. The relationship between being self-employed and SWB in other domains is not confirmed, probably due to the low sample size,

5.3 The role of working conditions

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[10] The index conversion into ISCO categories was created by Ganzeboom and Treiman (2003)

Having a good job provides people with the chance to fulfill their own ambitions, to develop skills and to build self-esteem. We discuss the results obtained on a wide spectrum of job characteristics such as the type of contract, supervisory position, union membership, working time schedule, job qualification, commuting requirements, on-the-job search, job security and employment prospects. Overall, the inclusion of working conditions substantially improves the explanatory power of the models and the R-squared increases the most in the job satisfaction model.

The type of contract

The Spanish labor market is characterized by a large share of workers employed on fixed-term contracts. In contrast to permanent contracts, fixed-term contracts offer no severance pay, low benefits and wages, little human capital accumulation and high turnover. Ferrer-i-Carbonell and Praag (2006) use the fixed effect regression to find that Spanish workers with a permanent contract report higher job satisfaction. Drobnic, Beham, and Präg (2010) estimate the life-satisfaction equation for the Spanish sample and they find no significant effect from the type of working contract. Similarly, our estimates imply that workers with a permanent contract do not report higher satisfaction in any domain. Permanent positions are likely to be associated with better working conditions and the positive effect on satisfaction is likely to be delivered through other channels made available by permanent contracts such as higher pay, better job prospects, recognition and regular working hours.

Supervisory positions

Supervisory positions are generally a step above the average employee and they are generally associated with higher pay, but also a higher degree of responsibility. Estimates imply that holding a supervisory position has no association with life-satisfaction, but provides a positive effect with regard to satisfaction with job.

More importantly, workers in supervisory positions have more difficulties with the family and work balance and report lower satisfaction in that domain.

Working schedules

Irregular working schedules are considered to negatively impact the SWB of workers. There is evidence to suggest that very long working hours can weaken personal health and increase stress (Spurgeon, Harrington and Cooper, 1997). Drobnic, Beham, and Präg (2010) include working hours in the quadratic form of the life-satisfaction regression and find that the point of inflection is around 41 hours per week. Our estimates clearly imply that working more than 40 hours a week and irregular working schedules display a negative association with all well-being domains. Particularly, work in the evenings or work on weekends significantly decreases the satisfaction with the family and work balance.

Job qualifications

Having a job that matches one's aspirations and competencies is a universal aspiration of most people. The lack of recognition at work may lead to a higher incidence of frustration when a worker's aspirations are not realized. One example is the situation of over-qualification, which is a common issue in the Spanish labor market. On average, one-third of the workers in the sample report they are over-qualified for their job, while 6 per cent of the workers report under-qualification. The estimated negative impact of over-qualification on a worker's well-being can be reasoned in two ways. First, the worker has invested in education but has received neither the expected return nor the status aspired to in their company. Second, in comparative terms, workers evaluate their status in relation to their counterparts who have the same qualifications but are most likely in better positions. Estimates imply that the negative effect of job mismatch does not translate to the family and work balance.

Labor unions

Civic engagement, which refers to the activities that people perform to contribute to the functioning of society, is essential to individual well-being (OECD, 2012). The literature suggests that the decision to join a trade union is a consequence of low job security and job dissatisfaction. This would imply that less contented workers in particular tend to join trade unions. Estimates imply that participation in a trade union conveys a positive impact on life-satisfaction but has a negative effect on job satisfaction. Therefore, union affiliation potentially delivers a positive effect corresponding to the importance of civic engagement and a negative effect corresponding to the type of worker who is discontent with work.

Job commuting

People spend a considerable amount of their valuable time commuting to and from work. Traveling longer distances is chosen if it results in a financially rewarding job or in additional welfare gained from a pleasant living environment. In general, commuting time exhibits a significant negative effect on SWB (e.g. Drobnic, Beham, and Präg 2010; Burón, 2009). Our estimates imply that satisfaction with a job is not affected by commuting requirements, while the satisfaction with the family and work balance is negatively affected by long-commutes. This supports the explanation that workers are likely to agree with job commuting in order to improve their situation in the labor market, but largely underestimate the negative effects of commuting in other domains.

On-the-job search, job insecurity and future career prospects

Results from literature demonstrate that employment stability is desirable for workers, and significantly affects their SWB (e.g. Drobnic Beham, and Präg , 2010; Burón, 2009; Ferrer-i-Carbonell and Praag, 2006). By including variables indicating on-the-job searches, job insecurity and good career prospects, we show that employment prospects

translate into different domains of SWB. Individuals who look for another job when they have a job indicate disappointment with their current employment situation, and as a result, the estimated coefficient on job search variables delivers a strong negative impact on job satisfaction. We consider a job to be insecure if a worker perceives that he or she may lose his or her job in the following year. Estimates imply that workers employed in jobs with less security exhibit a negative effect in all satisfaction domains. In contrast, a good career opportunity in one's current employment has a positive effect on all satisfaction domains. Estimates demonstrate that favorable job prospects are important determinants of satisfaction with the family and work balance.

The impact of past unemployment

Past unemployment negatively affects SWB (e.g. Clark, Georgellis and Sanfey, 2001). Unemployment places people at risk of social exclusion, poverty and deprivation. It has been found that unemployed individuals feel frustrated, rejected, and left out (Layard, Nickell and Jackman, 1994). We test the hypothesis by including a variable that identifies workers who have had past experience with a long-term spell of unemployment. The estimated coefficient is not significant at the conventional level for life-satisfaction and job satisfaction domains. However, the stigma of unemployment persists in satisfaction with the family and work balance.

6. Conclusions and discussion

Job quality is a multi-dimensional concept. Work is perceived not only as providing income, but for many, it may be the principal source of personal identity, mediating the sense of the contribution to society and being a valued person. Related to this, we identify several aspects of work characteristics that are particularly salient in the three domains of SWB ─ overall life-satisfaction, satisfaction with job, and satisfaction with

the family and work balance. In general, findings support the theory of spillover perspectives according to which satisfaction in one domain (work) spills into other domains (life and family). Our analysis provides several important results:

1. Jobs with high pay are often characterized by better working conditions. We show that the positive impact of personal income is largely diminished although does not become zero when job-related variables are added to the model. An important finding is that high-income earners exhibit less satisfaction with the family and work balance.

2. Self-reported health appears to be the most important influence on SWB, with those in very bad health reporting by far the lowest levels of SWB. This result is robust to the inclusion of working conditions in the analysis.

3. Empirical findings confirm a strong link between job insecurity and low well-being. Workers who deem that they will lose their job next year report lower satisfaction with life, job, and the family and work balance.

4. Conversely good career opportunities and job stability are positively correlated with satisfaction scores in all three domains.

5. Analysis suggests that certain job characteristics and working conditions such as long working hours, irregular working schedules and long work commutes have strong detrimental effects on overall worker life quality. Findings confirm that workers largely underestimate the negative effects of commuting on the quality of their life. Although satisfaction with jobs is not affected by commuting requirements, satisfaction with the family and work balance is negatively affected by long-commutes.

6. Job characteristics, such as occupation prestige or proper skill match exhibit a positive effect on satisfaction with life, and satisfaction with job, but do not interfere with the family and work balance.

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7.	Past unemployment experience has a negative effect on the satisfaction with the family and work balance.

In the current context of globalization and fast change, it is advised that researchers in social sciences make use of web data that are available along with traditional data. Specifically, we encourage the use of web survey data that can be calibrated using a representative sample collected in parallel, such as the Labor Force Survey. Scholars running surveys should consider the implementation of web based methods to increase the sample size, or to expand the scope of questionnaires. Newly established web surveys can learn from the WI project that is currently operating in more than 80 countries. The WI project opens diverse research opportunities and serves as a laboratory to study economic phenomena globally. WI data are collected in large numbers, but the sample characteristics and quality need to be evaluated on a country basis. With representative sample available in parallel, WI data can be calibrated or benchmarked with other labor data. Conclusions from this paper show that data from web-surveys can be used to study the SWB of nations. Finally, we encourage the interaction between different types of data collection methods via multiple channels. The validity of data can be promoted by the existing multidisciplinary networking processes that are efficient in reducing data drawbacks and providing them to the scientific community (Steinmetz et al, 2012). This would be a step towards providing scholars with updated, reliable and valid global data.

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APPENDIX

Table 1 The number of observations in the samples

Year	ESS	WI
2005	642	5508
2006	564	3142
2007	206	5962
2008	1038	3249
2009		933
2010		847
2011	995	454
Total	3445	20095

Source: The European Social Survey 2005-2011, Wage Indicator 2005-2011.
Note: The sample is limited to employed individuals aged 18-65 years.

Table 2 Descriptive statistics

	ESS		WI with PSA	WI	
	(1)		(2)	(3)	
	mean	s.dev	mean	mean	s.dev
Life-satisfaction	7.36	1.76	6.77	6.79	1.80
Female	0.48	0.50	0.40	0.44	0.50
Edu: Primary	0.51	0.50	0.43	0.21	0.40
Edu: Secondary	0.26	0.44	0.24	0.25	0.43
Edu: Tertiary	0.23	0.42	0.33	0.54	0.50
Single	0.31	0.46	0.38	0.53	0.50
Married	0.61	0.49	0.55	0.42	0.49
Divorced	0.07	0.25	0.06	0.04	0.20
Widowed	0.02	0.13	0.01	0.00	0.06
Age 18-24	0.10	0.30	0.11	0.08	0.27
Age 25-34	0.25	0.43	0.25	0.53	0.50
Age 35-44	0.28	0.45	0.28	0.27	0.45
Age 45-54	0.23	0.42	0.25	0.10	0.31
Age 55-64	0.15	0.35	0.11	0.02	0.13
Health: excellent	0.20	0.40	0.31	0.28	0.45
Health: good	0.51	0.50	0.29	0.33	0.47
Health: poor	0.24	0.43	0.23	0.24	0.42
Health: very poor	0.06	0.23	0.16	0.15	0.35
Foreign-born	0.07	0.25	0.06	0.07	0.26
Self-employed	0.15	0.36	0.00	0.01	0.07
Log income	7.45	0.58	7.32	7.37	0.58

Source: The European Social Survey 2004-2010, Wage Indicator 2005-2011.
Note: Samples are limited to employed individuals 18-65 years old. WI with PSA in Column 2 presents the WI sample after implementing propensity score adjustment weights. In the ESS, information on net monthly income at the household level is calculated using the mid-point of each income bracket. The WI includes information on individual gross monthly income.

Table 3 Life-satisfaction equations: a comparison of the ESS and WI surveys

	ESS		WI with PSA		WI	
	(1)		(2)		(3)	
Female	0.045		0.067		0.056	**
	(0.059)		(0.054)		(0.025)	
Edu: Secondary	-0.111		-0.022		0.077	**
	(0.073)		(0.061)		(0.035)	
Edu: Tertiary	0.005		0.077		0.163	***
	(0.079)		(0.055)		(0.033)	
Married	0.569	***	0.473	***	0.476	***
	(0.079)		(0.056)		(0.028)	
Divorced	-0.235	*	0.173		0.105	*
	(0.135)		(0.119)		(0.063)	
Widowed	-0.329		0.155		-0.069	
	(0.234)		(0.349)		(0.204)	
Age 15-24	ref.		ref.		ref.	
Age 25-34	-0.178		-0.206	**	-0.152	***
	(0.115)		(0.080)		(0.047)	
Age 35-44	-0.351	***	-0.394	***	-0.428	***
	(0.124)		(0.093)		(0.053)	
Age 45-54	-0.433	***	-0.414	***	-0.388	***
	(0.132)		(0.111)		(0.062)	
Age 55-64	-0.222		-0.158		-0.164	
	(0.142)		(0.162)		(0.102)	
Health excellent	ref.		ref.		ref.	
Health good	-0.361	***	-0.491	***	-0.507	***
	(0.078)		(0.056)		(0.030)	
Health poor	-0.758	***	-1.127	***	-1.11	***
	(0.091)		(0.065)		(0.033)	
Health very poor	-1.338	***	-1.769	***	-1.789	***
	(0.144)		(0.089)		(0.038)	
Foreign-born	-0.073		0.046		0.042	
	(0.116)		(0.082)		(0.046)	
Self-employed	-0.034		-0.069		0.114	
	(0.081)		(0.317)		(0.168)	
Log income	0.391	***	0.265	***	0.315	***
	(0.055)		(0.056)		(0.024)	
Constant	4.773	***	5.265	***	4.865	***
	(0.440)		(0.397)		(0.172)	
r2	0.094		0.137		0.149	
N	3445		20095		20095	

Source: European Social Survey 2004-2010, Wage Indicator 2005-2011.
Note: Dependent variable is satisfaction with life variable. Presented are OLS estimates with standard errors in parenthesis. * / ** / *** indicate significance at the 10% / 5% / 1% level. See also notes to Table 2.

Table 4 Satisfaction equations: factors determining the quality of a job

	Satisfaction with life				Satisfaction with job				Satisfaction with work and family			
	(1)		(2)		(3)		(4)		(5)		(6)	
Female	0.018		0.035		0.038		0.07	**	-0.167	***	-0.184	***
	0.055		0.053		0.037		0.033		0.036		0.034	
Edu: Primary	ref.		ref.		ref.		ref.		ref.		ref.	
Edu: Secondary	-0.052		0.004		-0.014		0.072	*	0.025		0.005	
	0.062		0.062		0.042		0.039		0.04		0.04	
Edu: Tertiary	0.005		0.083		0.024		0.13	***	0.057		0.037	
	0.06		0.066		0.041		0.04		0.041		0.042	
Single	ref.		ref.		ref.		ref.		ref.		ref.	
Married	0.531	***	0.536	***	0		0		0.084		0.102	*
	0.09		0.085		0.06		0.054		0.059		0.057	
Living with partner	0.347	***	0.387	***	-0.057		-0.01		-0.021		0.002	
	0.082		0.079		0.057		0.049		0.056		0.054	
Divorced	0.358	***	0.398	***	0.062		0.093		0.019		0.055	
	0.135		0.131		0.086		0.078		0.084		0.08	
Widowed	0.289		0.253		0.177		0.113		0.326	*	0.338	**
	0.373		0.362		0.262		0.235		0.174		0.162	
Age 15-24	ref.		ref.		ref.		ref.		ref.		ref.	
Age 25-34	-0.267	***	-0.219	***	-0.127	**	-0.015		-0.096		-0.082	
	0.082		0.079		0.06		0.048		0.059		0.054	
Age 35-44	-0.449	***	-0.395	***	-0.12	*	0.021		-0.029		-0.04	
	0.096		0.093		0.068		0.057		0.067		0.064	
Age 45-54	-0.44	***	-0.432	***	-0.007		0.114	*	0.222	***	0.158	**
	0.114		0.113		0.079		0.068		0.078		0.076	
Age 55-64	-0.213		-0.189		-0.065		0.024		0.334	***	0.258	**
	0.165		0.157		0.117		0.109		0.103		0.105	
Health excellent	ref.		ref.		ref.		ref.		ref.		ref.	
Health good	-0.498	***	-0.523	***	-0.091	**	-0.118	***	-0.402	***	-0.403	***
	0.056		0.054		0.041		0.037		0.039		0.037	
Health poor	-1.118	***	-1.073	***	-0.386	***	-0.343	***	-0.72	***	-0.66	***
	0.065		0.062		0.045		0.041		0.044		0.042	
Health very poor	-1.745	***	-1.641	***	-0.816	***	-0.713	***	-1.235	***	-1.147	***
	0.09		0.087		0.056		0.054		0.056		0.056	
Foreign-born	0.147	*	0.191	**	0.044		0.046		-0.032		0.054	
	0.085		0.083		0.068		0.063		0.057		0.057	
Self-employed	-0.133		-0.079		0.594	***	0.338	*	-0.122		-0.237	
	0.32		0.342		0.154		0.194		0.187		0.214	
Occupation prestige	0.006	***	0.003		0.008	***	0.004	***	0.001		0	
	0.002		0.002		0.001		0.001		0.001		0.001	
Log personal income	0.248	***	0.127	**	0.264	***	0.085	**	-0.035		-0.068	*
	0.058		0.059		0.038		0.037		0.036		0.037	
Main household earner	-0.12	**	-0.123	**	0.023		0.02		-0.087	**	-0.062	*
	0.058		0.055		0.04		0.035		0.036		0.034	
Lives with child aged 0-5y	0.071		0.047		0.025		0.02		-0.089	**	-0.113	***
	0.056		0.055		0.046		0.041		0.04		0.04	
Lives with child aged 6-17y	-0.107		-0.123	*	0.013		-0.019		-0.037		-0.05	
	0.069		0.065		0.045		0.04		0.046		0.044	
House owner	0.319	***	0.289	***	0.079	*	0.056		0.18	***	0.151	***
	0.065		0.061		0.043		0.038		0.04		0.039	
Lives with parents	-0.116		-0.072		0.008		0.032		-0.085		-0.04	
	0.079		0.076		0.052		0.046		0.054		0.053	

Table 4 continued

	(1)		(2)		(3)		(4)		(5)		(6)	
Permanent contract			-0.041				-0.159	***			-0.054	
			0.055				0.035				0.038	
Supervisory position			0.011				0.084	**			-0.087	**
			0.053				0.034				0.035	
Over-qualified for job			-0.247	***			-0.263	***			-0.033	
			0.053				0.032				0.034	
Member of trade union			0.114	**			-0.061	*			-0.029	
			0.057				0.036				0.038	
Working hours >40			-0.246	***			-0.095	**			-0.264	***
			0.07				0.044				0.045	
Works in night			-0.1	**			-0.053				-0.321	***
			0.051				0.034				0.034	
Works on weekend			-0.08				-0.077	**			-0.3	***
			0.06				0.038				0.042	
Work: commutes 15-45min			-0.091	*			-0.007				-0.174	***
			0.05				0.032				0.034	
Work: commutes >45			-0.156	*			0.012				-0.364	***
			0.08				0.052				0.054	
Looking for another job			-0.375	***			-0.723	***			-0.279	***
			0.056				0.034				0.035	
Good career opportunities			0.626	***			0.744	***			0.288	***
			0.055				0.037				0.039	
Job is insecure			-0.475	***			-0.347	***			-0.102	*
			0.088				0.053				0.057	
Past unempl. experience			-0.059				-0.069				-0.111	**
			0.081				0.048				0.055	
Constant	5.042	***	6.326	***	0.953	***	2.63	***	3.713	***	4.648	***
	0.419		0.426		0.28		0.268		0.25		0.26	
r2	0.149		0.197		0.102		0.261		0.148		0.215	
N	20095		20095		20095		20095		20095		20095	

Source: Wage Indicator 2005-2011.

Note: Presented are OLS estimates. * / ** / *** indicate significance at the 10% / 5% / 1% level. Samples are limited to employed individuals 15-65 years old.

Table 5: Variable Definition

Variable name	Definition	Mean
Satisfaction with life	Satisfaction with life as-a-whole is measured on an ordinal 10-point scale. A higher value means that a person currently feels more satisfied.	6.73
Satisfaction with job	Measured on an ordinal 5-point scale from 'highly dissatisfied' (1) to 'highly satisfied' (5). A higher value means that a person currently feels more satisfied.	2.99
Satisfaction with the combination of family and work	Measured on an ordinal 5-point scale from 'highly dissatisfied' (1) to 'highly satisfied' (5). A higher value means that a person currently feels more satisfied.	3.19
Female	Female =1, male=0	0.41
Edu: primary	(International Standard Classification of Education 0-2)=1, otherwise=0 (reference)	0.39
Edu: secondary	(ISCED 3-4)=1, otherwise=0	0.23
Edu: tertiary	(ISCED 5-6)=1, otherwise=0	0.38
Single	Never married and not living with a partner=1, otherwise=0 (reference)	0.41
Married	Married=1, otherwise=0	0.53
Living with partner	Never married and living with a partner =1, otherwise=0	0.13
Divorced	Divorced =1, otherwise=0	0.05
Widowed	Widowed =1, otherwise=0	0.01
Age 15-24	Age of respondent 15-24=1, otherwise=0 (reference)	0.12
Age 25-34	Age of respondent 25-34=1, otherwise=0	0.29
Age 35-44	Age of respondent 35-44=1, otherwise=0	0.30
Age 45-54	Age of respondent 45-54=1, otherwise=0	0.22
Age 55-64	Age of respondent 55-64=1, otherwise=0	0.08
Health status	Satisfaction with health is measured on an ordinal 4-point scale from 'highly dissatisfied' (1) to 'highly satisfied' (4). A higher value means that a person currently feels more satisfied.	2.77
Foreign-born	Respondent was not born in Spain=1, otherwise=0	0.06
Self-employed	Respondent is self-employed=1, otherwise=0	0.01
Occupation prestige	Occupational prestige is measured by index with 0 being the lowest possible score to 100 being the highest. The index conversion into ISCO categories is created by Ganzeboom and Treiman (2006)	43.08
Personal income	Logarithm of gross monthly income in EUR (it include bonuses, if these were received in the last wage)	7.31
Child 0-5 years	Child below age 6 lives in the household=1, otherwise=0	0.14
Child 6-17 years	Child older than 5 lives in the household=1, otherwise=0	0.24
House owner	House is owned=1, otherwise=0	0.78
Main household earner	Contributes most to household income and not single=1, otherwise=0	0.50
Lives with parents	Lives with parents=1, otherwise=0	0.21
Permanent Contract	Respondent has permanent employment contract=1, otherwise=0	0.78
Supervisor	= Respondent has supervisory position=1, otherwise=0	0.39
Over-qualified for job	Respondent is overqualified for the job=1, otherwise=0	0.32
Member of trade union	Member of a trade union=1, otherwise=0	0.37
Hours of Work	The contractual hours for a worker in dependent employment. Works more than 40 hours per week=1, otherwise=0.	0.15
Work in the evening	Respondent works regularly in the evenings=1, otherwise=0	0.60
Work on weekends	Respondent works regularly on Saturdays or Sundays=1, otherwise=0	0.26
Work commutes 0-15 min	Commuting 0-15min one way=1, otherwise=0	0.43
Work commutes 15-45 min	Commuting 15-45min one way=1, otherwise=0	0.47
Work commutes >45 min	Commuting 45+ min one way=1, otherwise=0	0.10
Looking for another job	Respondent has been looking for another job in past 4 weeks=1, otherwise=0	0.24
Good career opportunities	Respondent has good career opportunities in organization=1, otherwise=0	0.21
Job is insecure	Job will become redundant next year=1, otherwise=0	0.12
Past unemployment experience	Respondent was looking for the first job longer than one year=1, otherwise=0	0.13