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# Vignette Equivalence and Response Consistency; The Case of Job Satisfaction

## Abstract

We compare reported job satisfaction with vignette evaluations of hypothetical jobs by using a British, Greek and Dutch data set, containing 95 randomly assigned vignettes. In order to test comparability of international data sets recently the method of anchoring vignettes has been introduced by King et al. (2004). This intuitively and attractive idea requires the properties of vignette equivalence and response consistency. In our data set both job satisfaction and vignettes are numerically evaluated on a 0-10-scale. This fact allows us to interpret the evaluations as cardinal satisfaction values and to estimate satisfaction functions for vignettes and for the own job situation. We find that both functions differ significantly: vignette evaluations appear to depend on the own job situation and other individual characteristics. Hence, without correction for those differences in background characteristics, vignette evaluations are not comparable between individuals. Similar conclusions are reached for response consistency.

JEL-Code: J280, D600, J240, C250.

Keywords: vignettes, vignette equivalence, response consistency, job satisfaction, subjective well-being.

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## **1. Introduction.**

Job satisfaction is considered as an important issue in economics, and more specifically in labor economics and the fields of human resources, personnel economics etc (Freeman, 1978). A large part of the research in job satisfaction is based on the use of a self-reported job satisfaction measure, derived from questionnaires in which respondents are asked to report how satisfied they are with their own job. The same tool of self-reported measures is used for other life domains, such as health, financial situation, and for measuring individuals' satisfaction with their life in general, that is, 'life as a whole'. An alternative tool to generate subjective evaluations is to present the respondents with a set of hypothetical situations that they have to evaluate. The hypothetical situations are known as vignettes. This methodology is extensively used in psychology and marketing (Green and Srinivasan, 1978 and Louvière et al. 2000) and more recently also in economics (Van Beek et al., 1997; Van Ophem et al., 1999; Kapteyn et al., 2007; and Bago d'Uva et al., 2010).

In this study we focus on job satisfaction and we examine whether individuals evaluate satisfaction with their own job (job satisfaction) in a similar manner as they evaluate hypothetical jobs (vignettes). We assume that a job can be described by objectively measurable variables such as wage, hours worked, working conditions, and type of contract and that we are able to describe both the individual's current job and hypothetical jobs in those terms. We then examine the link between these job characteristics and both, individual current job satisfaction and the individual's evaluations of the vignettes defined with the use of those job characteristics. In the earlier literature the response categories are described by means of verbal labels like 'bad', 'sufficient', and 'good'. In the more recent literature these verbal evaluations are usually replaced by numerical evaluations on a 1-7 scale or a 0-10-scale. This transition from verbal to numerical responses is not immaterial. The verbal scale

may be seen as an ordinal ranking, where we do not know whether ‘the evaluation ‘good’ has the same emotional connotation for respondent *A* as for respondent *B*. The numerical scale, on the contrary, may be seen as a cardinal evaluation by the respondent, although it is yet unknown whether a ‘7’ has the same emotional connotation for respondent *A* as for respondent *B*.

This paper contributes to the literature that uses vignettes to extract information about individuals’ preferences and to correct answers on subjective questions for individual heterogeneity King et al. (2004) were the first to suggest ‘anchoring’ vignettes as an additional tool to test whether satisfaction responses are comparable. They supplied different people with the same vignette and observed whether they evaluated it equally or differently. Kapteyn et al. (2007), Bago d’Uva et al. (2009), and Voňková and Hullegie (2010), applied and tested the technique on its validity.

The use of anchoring vignettes requires two main assumptions, namely vignette equivalence and response consistency. Response consistency means an individual evaluates his own job in a similar way as he evaluates hypothetical jobs, described by vignettes. Vignette equivalence implies that different respondents interpret and evaluate the vignettes similarly.

Kapteyn et al. (2007), Bago d’Uva et al. (2010), and Voňková and Hullegie (2010) applied and tested the anchoring vignette technique on its validity. Its usefulness as a substitute or as an extension of the subjective satisfaction questions clearly depends on whether the assumptions of *vignette equivalence* and *response consistency* are simultaneously satisfied. Kapteyn et al. (2007) and Bago d’Uva et al. (2010) have looked into this problem and tested the validity of these assumptions with mixed results.

In this paper we test *vignette equivalence* and *response consistency*, using a European data set on job satisfaction. Besides adding a piece of evidence to the still scarce literature, this paper differs from previous literature in two main aspects. One, in the questionnaire individuals are asked to evaluate both their current job satisfaction and the vignettes not on the usual verbal scale with a few categories but on a numerical scale from 0 to 10, enabling us to assume a cardinal interpretation. This allows us to diverge from the chopit-model (e.g., Kapteyn et al., 2007 and Kristensen and Johansson, 2008) that estimates the threshold values separately. Instead making use of the cardinal character of both properties to be tested, we use OLS-estimations to test for equivalence and consistency. We allow the vignettes evaluations by the same individual to be correlated. Two, our data set includes a significantly larger number of vignettes than the other studies. We use 95 different vignettes of which varying 5-tuples are supplied to respondents. This means that we have much more variation than the typical study that includes 3 to 5 vignettes in total.

The empirical results show that both assumptions (vignette equivalence and response consistency) do not hold in their simple form. However, the interpretative differences between respondents can be partly ascribed to heterogeneity for which correction terms may be devised.

## **2. The theoretical model.**

In the present context the vignettes are used to describe hypothetical job scenarios. A typical vignette is presented in Figure 1. The vignette describes the job by means of a vector  $z$  of job characteristics, such as wage, type of contract, and working hours. Respondents are asked to evaluate each vignette on a scale from zero to ten. The evaluation of the vignette is denoted by  $V(z)$  and we distinguish between individuals  $A$  and  $B$  by denoting  $V_A(z)$  and  $V_B(z)$

respectively, where we admit for the possibility of individually different vignette evaluation functions. It seems intuitively plausible that respondents evaluate these fictitious jobs by relating them to their own actual job situations ( $z_A$  and  $z_B$ ). Therefore, we assume a vignette evaluation function of the type  $V_A=V(z; z_A)$  and  $V_B=V(z; z_B)$ . The variables  $z_A$  and  $z_B$  represent the current job characteristics that strictly relate to the vignette description. For example, the fact whether the individual works on Sundays or is member of a trade union organization is not included as part of the  $z_A$  and  $z_B$ , since these attributes are not part of the vignettes. In addition, it may well be that the vignette evaluation also depends on other individual characteristics  $x$ , such as age, education level, number of children, or job characteristics not included in the vignette, such as whether the individual works with computers or is a member of a trade union. In that case we describe the evaluation function as  $V_A=V(z; z_A, x_A)$ . If the vignette evaluation functions  $V(z)$  do indeed depend on  $z_A, z_B, x_A$ , or  $x_B$ , we can conclude that the individuals' evaluations are influenced by their different background conditions. The causes of the differences in evaluation, however, are traceable; the evaluations can be corrected per respondent for different background conditions and be made comparable, as long as  $A$  and  $B$  have the same vignette evaluation function. If the functions  $V_A(z)$  and  $V_B(z)$  are different, e.g., they have different parameters, incomparability cannot be corrected as the individuals evaluate according to different evaluation schedules (or norms). In this case we need to reject vignette equivalence. If individuals do have the same vignette evaluation function  $V=V(z; z_A, x_A)$ , the evaluation differences of a specific vignette between individuals may be completely explained by differences in  $z_A$  and  $x_A$ .

The second assumption, i.e., response consistency, can be tested as well. We assume a job satisfaction function  $U(z_A; x_A)$ . Individuals may be asked to evaluate a vignette that fits their own job situation. The vignette evaluation would then be  $V(z_A; z_A, x_A)$  and this should be

identical (on the same 0 to 10-scale) to their job satisfaction ( $U_A = U(z_A; x_A)$ ). Thus, response consistency holds if and only if  $V(z_A; z_A, x_A) \equiv U(z_A; x_A)$ . In this study the two evaluation functions  $V(\cdot)$  and  $U(\cdot)$  are estimated and compared, using data derived from the Epicurus Survey.

### 3. The data

The data set for this study was developed in the framework of the European EPICURUS-project from identical surveys carried out in various European countries between July and September 2004 among workers. In this paper we only utilize the data for Greece, the Netherlands, and the U.K.<sup>1</sup>. In the Netherlands and the UK, the survey was Internet-based, while in Greece, where the Internet penetration was rather low, face-to-face interviews were used instead and a protocol, identical to the Internet survey, was followed. There were 1000 observations for the Netherlands and the United Kingdom each and (due to the larger costs) 800 for Greece. In order to guarantee a certain degree of sample homogeneity, the sample was restricted to employed individuals (excluding non-workers and self-employed) with low

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<sup>1</sup> The survey took place in the framework of the EPICURUS- project. The main objective was obtaining more insight in the labor market conditions of European citizens and how these conditions affect their quality of life. Since the surveys for Greece, the Netherlands and the UK were implemented by the same company that guaranteed the use of identical protocols, only the data for these three countries are used here. The questionnaire was developed by Ioannis Theodossiou (project leader), Ada Ferrer-i-Carbonell, and Bernard M.S. Van Praag. Kristensen and Johansson (2008) use the complete data set, also including Denmark, Finland, France, and Spain for another study. The company responsible for the survey was Interview-NSS (currently Synovate), a company with much experience on surveys in various countries.



or middle education (i.e. excluding individuals with an education level 5 or 6 in the ISCED International Classification 1997), In addition, workers in the agriculture or fishery sectors were also excluded. The final sample is representative for the target sub-population group in each of the countries.

A considerable part of the questionnaire was devoted to the respondents' evaluation of the vignettes.<sup>2</sup> Figure 1 shows a simplified version of a vignette.

**Figure 1. Example of a vignette**

Imagine that, for some reason you had to stop with your current job and had to look for a new one. Imagine that after a short time you get several offers. We will list them on the following screen. These listed jobs offers do not differ from your current job except for some points we specifically mention.

Can you please evaluate these offers on a scale from 0 to 10, where 0 means the worst possible and 10 the best possible offer? And indicate if they are acceptable?"

**Wage:** 20% more than now per hour

**Type of contract:** Permanent with risk of losing the job with no severance pay

**Working hours:** 20 hours a week

**Working times:** Rotating shift system

**Training Opportunities:** The employer will offer you a 10 workdays training program in the course of the year.

**Work organization:** The job involves working in a varying team

**Work Conditions:** No one controls your work

**Work Speed:** The job is fairly demanding, which means that sometimes you may have to work at high speed

**Retirement:** You can retire at age 55

**Behavioral norms:** Same working conditions as in other firms No loyalty from both sides. Shirking and low performance is possible

How would you rate this offer?

*Please evaluate this offer on a scale from 0 to 10 where 0 means the worst possible and 10 the best possible job.*

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<sup>2</sup> In Table 2.A we present the complete list with all the job attributes and the value ranges that they can take. These are available upon request.

The set of specific attributes chosen to be included in the vignettes is by no means an exhaustive characterization of a job, but it is sufficiently informative for the purpose and focus of this paper. Since a full characterization of a job is clearly impossible, the vignette description is completed by indicating to the respondent that all the aspects of the hypothetical job other than the dimensions explicitly mentioned in the vignette are identical to the respondent's own present working conditions. Each vignette is described by 10 job attributes, each of which can take various values. In Table 1A we give a complete list of all the attributes and its possible values. For example, the job attribute 'type of contract' can take 6 different values, varying from a permanent contract with no risk of being fired to a one-year contract with no probability of continuation. The reader will notice that in the vignettes *wage* is defined in terms of a relative deviation from the current wage of the respondent. This procedure eliminates the usual problems of wage definition and the problems that arise if respondents with widely different wages have to evaluate the same vignettes.

Preliminary trials showed that five vignettes was the maximum number that could be presented to a respondent in an Internet survey in order to maintain a satisfactory response. In order to create more variation to estimate the individual's vignette evaluation function (VEF), we created a total sample of 95 different vignettes that were randomly divided into 19 subsets of 5 vignettes each. Each set of 5 vignettes was randomly allocated over the respondents so that each respondent would only have to answer 5 vignettes, while in the meantime valuations of 95 hypothetical jobs would be collected. In order to eliminate possible ordering effects, the respondents were allowed to go backwards and forwards on the screen and see the vignettes several times. An identical approach was followed in the face-to-face interviews.

In the questionnaire, respondents were asked to evaluate the vignettes on a 0 to 10 scale. The average rating for the vignettes was 4.12 and the evaluations varied over the whole offered scale (i.e. 0 to 10). The highest average rating is reported for Greece closely followed by the Netherlands.

In line with the usual practice in the literature, the respondents were also asked to evaluate their own job satisfaction using a 0-10 point scale. The job satisfaction question was asked before the vignettes were supplied but after the respondents had already been asked a set of questions about their current job situation. The answer to this question is, in line with the literature, taken as a proxy measure for individual job satisfaction. In the sample, individual average job satisfaction was 6.843. The highest average job satisfaction was reported in the Netherlands (7.325) and the lowest in the U.K. (6.346).

Finally, the questionnaire includes a wealth of details regarding the respondent's current socio-economic status and job situation. This information is used to explain the individuals' job satisfaction and their evaluation of vignettes.

#### **4. Estimation Methodology**

As both the vignette evaluation function and the job satisfaction function are bounded by the questioning mode between zero and ten, it is trivial to divide all answers by 10 in order that they vary between zero and one. The vignette evaluation function is now specified as a standard normal distribution function as follows:

$$V_A = N (\beta'z + \gamma'z_A + \delta'x_A + \beta_0; 0,1) \quad (1)$$

We denote the corresponding quantile by  $v_A = N^{-1}(V_A)$ . The equivalent relationship is:

$$v_A = \beta'z + \gamma'z_A + \delta'x_A + \beta_0 \quad (2)$$

Using (1) or (2), it is easy to see that vignette equivalence implies  $\gamma = 0$  and  $\delta = 0$ , which is testable by estimation. If  $\gamma$  and/or  $\delta$  are non-zero, the vignette evaluation will depend on the respondent's situation. However, it is possible to control for the differences in  $(z_A, x_A)$  and on the basis of the estimated relationship (2) to predict the response of respondent  $A$  on a specific vignette if his job would have been  $\tilde{z}_A$  instead of  $z_A$  or when his characteristics were  $\tilde{x}_A$  instead of  $x_A$ .

Similarly to the vignettes case, the answers to the job satisfaction question can be transformed yielding the linear equation

$$u_A = \gamma'_u z_A + \delta'_u x_A + \beta_{u,0} \quad (3)$$

If there is response consistency, then there must hold  $V(z_A; z_A, x_A) \equiv U(z_A; x_A)$ . Consequently the following (vector-) equalities should hold

$$\begin{aligned} \beta + \gamma &= \gamma_u \\ \delta &= \delta_u \\ \beta_0 &= \beta_{u,0} \end{aligned} \quad (4)$$

between the parameters in equations (2) and (3).

The estimation of these equations and the testing of the two assumptions rests on the implicit assumption that the numerical evaluations have the same emotional value in terms of job satisfaction or vignette evaluation for all respondents. In other words, individual responses are interpersonal comparable. This does not mean that individuals are assumed to value the same situation similarly, but that they do feel equally satisfied when they report the same number.

The econometric approach in this paper is based on linking the normal quantiles  $u_{0.1}, u_{0.2}, \dots$  to the answers provided by the respondent to estimate  $v_A$  in equation(2) and  $u_A$  in equation(3). Applying a similar procedure for the outer extremes, the values  $u_{0.025}$  and  $u_{0.975}$  are assigned to the responses 0 and 10 respectively. The variable to be explained is observed with a rounding-off error, but this does not lead to inconsistent estimates.

Van Praag and Ferrer-i-Carbonell (2004 and 2008, chapter 2) empirically demonstrate that in applying OLS estimation after the above transformation, the coefficient estimates and their *t-ratios* are similar to those of the corresponding latent model in Probit, except for a common positive factor of multiplication. This implies that the trade-off ratios between variables are very similar as well, which is intuitively to be expected as both approaches boil down to estimating the same net of indifference curves. This method is one member of a group of similar methods, suggested by Van Praag and Ferrer-i-Carbonell that can be used as more flexible alternatives to Probit. Recently, these methods have also been applied by Luechinger (2009), Stevenson and Wolfers (2008), and Pischke (2010).

Since each individual is asked to evaluate a set of five vignettes, we allow for correlation between the error terms of the five different vignette evaluations. Thus, we apply an

individual random effect and we decompose the error term in the vignette evaluation function as:

$$\varepsilon_{nj} = \varepsilon_n + \eta_{nj} \quad (5)$$

where the first term is the individual random effect and the second is the usual white noise varying over the vignettes. Assuming that  $E(\varepsilon_n) = 0$ ,  $E(\eta_{nj}) = 0$ ,  $E(\varepsilon \cdot \eta) = 0$ , one may apply the usual individual random effect model of panel analysis on the five vignette evaluation responses.

## 5. Results

In Table 1 we present the estimation results for the vignette (equation(2)) and for the job satisfaction (equation(3)) for each of the three countries separately. The first part of the table gives the coefficients  $\beta$ , corresponding to the variables  $z$  describing the vignette. The corresponding estimates do not exist for the job satisfaction equation. The second part gives the coefficients  $(\gamma, \gamma_u)$ , which correspond to  $z_A$ , the variables describing the characteristics of the current job that strictly relate to the attributes described in the vignettes. Finally, the third part gives the effects  $(\delta, \delta_u)$  of the non-job related variables or those job characteristics that are not included in the vignettes  $x_A$ .

### 5.1 Testing vignette equivalence and response consistency

#### 5.1.1 Vignette equivalence.

Vignette equivalence means that individuals do not systematically differ in the way they understand the vignettes. In our empirical analysis, we estimate the three countries separately

and therefore we need to test whether (i) respondents in one country evaluate vignettes identically; and (ii) respondents in different countries evaluate vignettes identically.

In order to respond to the first question (the within country aspect) we look at the statistical significance of the coefficients of parts 2 and 3 of Table 1 of the vignette equation columns. The variables describing the job situation that is linked to the vignettes ( $z_A$ ) (coefficients in part 2) have a very small statistical impact on the vignette evaluation and we see only a few statistically significant effects. Notably, Greek workers with different working time arrangements evaluate vignettes differently. However, on the whole nearly all coefficients do not differ statistically significantly from zero. With respect to the other coefficients (part 3, variables  $x_A$ ) we see that only the number of income earners in the household is statistically significant in Greece and UK. Therefore, and after correcting for those few differences, vignettes seem to be well-comparable *within* the three countries considered.

With respect to the *between*-country differences in the evaluation of the vignettes the situation is less positive. The coefficients of those variables that describe the vignette attributes (part 1,  $z$ ) mostly do not significantly differ among countries, but there are some statistically significant differences. The optimal number of working hours is at about 25 hours a week in the three countries. However, the sensitivity to differences in working hours is very high in the Netherlands, much less in the UK and by far the smallest in Greece. Although most of the coefficients describing the individual job characteristics included in the vignettes (part 2,  $z_A$ ) are not statistically significant, there are statistically significant differences between countries. For instance, in the UK the variable indicating that the worker currently works for a firm that offers early retirement possibilities at 55 has a negative effect on the

vignette evaluation. The current job characteristics that are not mentioned in the vignettes or the non-job characteristics (part 3,  $x_A$ ) do not differ dramatically between the countries.

**Table 1: Vignette and Job Satisfaction equations estimated.**

Part 1 : (z)	Greece		Netherlands		U.K.	
	Vign.	JS	Vign.	JS	Vign.	JS
Constant	-6.476	2.143 **	-11.422 *	-8.173	-3.409	-28.242 *
<i>Variables describing the vignette</i>						
<i>Type of contract</i>						
Perm. cont. with no risk	0.269 **		0.341 **		0.293 **	
Perm. cont. with risk but compensation	0.146 **		0.210 **		0.125 **	
Perm. cont. with risk & no compensation	0.089		0.114 **		-0.060	
Temp. cont. to perm. cont	0.091		0.248 **		0.241 **	
Temp. cont. to temp. cont (ref. Temp.cont. to unempl.)	0.076 *		0.246 **		0.251 **	
<i>Ln(Working hours/week)</i>	1.951 *		9.539 **		5.523 **	
<i>Ln(working hours/week)^2</i>	-0.304 *		-1.429 **		-0.843 **	
<i>Wages</i> (in % of own income)	1.276 **		1.006 **		1.420 **	
<i>Working times</i>						
Office working hours	0.014		0.100 **		0.126 **	
Working times decided by employee	0.010		0.051		0.111 **	
Rotating shifts (ref. working times decided by employer)	-0.150 **		-0.107 **		-0.069 **	
<i>Training</i>	-0.012		-0.027 **		-0.039 **	
<i>Work organization</i>						
Job not in teamwork	0.028		-0.008		0.058 *	
Job in varying teamwork (ref. Job in fixed team)	0.037		0.000		0.083 **	
<i>Control over own work</i>						
Job has a fixed routine	0.023		-0.097 **		-0.075 **	
Can choose order tasks (ref. no one controls your work)	-0.028		0.062 *		0.068 **	
<i>Intensity due to high speed</i>						
Often high speed	-0.083 **		-0.203 **		-0.153 **	
Sometimes high speed (ref. never working at high speed)	-0.004		-0.092 **		-0.044	
<i>Intensity due to tight deadlines</i>						
Often tight deadlines	-0.052		-0.096		-0.145 **	
Sometimes tight deadlines (ref. never working with tight deadlines)	-0.090 **		-0.044 **		-0.061 *	
<i>Retirement</i>						
<i>Have to stop before 65</i>	-0.025 **		0.128 **		0.061 **	
Early retirement 55	0.239 **		0.216 **		0.186 **	
Early retirement 60 (ref. firm has no early retirement plans)	0.160		0.221		0.208	



Continuation Table 1

<i>Part 2 : (z<sub>A</sub>)</i>	Greece		Netherlands		U.K.	
	Vign.	JS	Vign.	JS	Vign.	JS
<i>Variables describing respondent's current job ,being also attributes of the vignettes</i>						
<i>Missing inform. Wage</i>	-0.588	1.143 **	-0.224	0.105	0.187	0.195
<i>Ln(monthly net wage)</i>	-0.096	0.169 **	-0.036	0.018	0.046 *	0.014
<i>Type of contract</i>						
Perm. cont. with no risk	-0.060	0.258	-0.243	0.374 **	-0.070	0.377
Perm. cont. with risk but compensation	-0.054	0.221	-0.167	0.230	-0.038	0.214
Perm. cont. with risk & no compensation	-0.004	0.129	-0.141	0.104	-0.065	-0.022
Temp. cont. to perm. cont	0.176	-0.245	-0.341	0.191	0.100	0.192
Temp. cont. to temp. cont	0.115	0.047	-0.094	0.479 **	0.096	0.390
Other type of contract (ref. Temp. cont. to unempl.)	-0.045	0.092	-0.165	0.345 *	-0.107	0.330
<i>Ln(Working hours/week)</i>	-1.419	-2.629	-0.006	-0.161	-0.858**	0.073
<i>[Ln(Working hours/week)]<sup>2</sup></i>	0.217	0.360	0.015	0.029	0.141 **	-0.025
<i>Missing inform. on working hours</i>	-2.189	-4.984 *	0.122	0.058	-1.268**	-0.077
<i>Working times</i>						
Office working hours	0.031	0.105	-0.030	0.037	0.029	-0.042
Working times decided by employee	0.311 **	0.493 **	-0.002	0.098 *	0.004	0.148
Rotating shifts (ref. working times decided by employer)	0.159 **	0.111	0.063	0.030	0.022	-0.106
<i>Training</i>	0.030 *	-0.014	-0.003	-0.033**	-0.023 *	-0.072 **
<i>Work organization</i>						
Job not in teamwork	-0.126 *	-0.221 **	0.069	0.001	-0.035	-0.085
Job in varying teamwork (ref. Job in fixed team)	0.061	-0.029	-0.034	-0.049	-0.025	-0.089
<i>Control over own work</i>						
Job has a fixed routine	-0.123	-0.219 *	-0.038	-0.213**	0.014	-0.124
Can choose order tasks (ref. no one controls your work)	-0.067	-0.173	-0.042	-0.059	-0.012	0.136
<i>Intensity due to high speed</i>						
High high speed	-0.037	-0.058	-0.038	-0.129**	0.001	0.019
Medium high speed (ref. Low high speed)	0.061	0.080	0.058	-0.061	0.053	0.012
<i>Intensity due to tight deadlines</i>						
High tight deadlines	0.066	-0.060	0.050	-0.036	0.078 *	0.045
Medium tight deadlines (ref. Low tight deadlines)	-0.031	-0.051	0.033	-0.036	-0.001	0.043
<i>Retirement</i>						
Early retirement 55	-0.009	0.113	-0.081	-0.304	-0.235**	0.172
Early retirement 60 (ref. retirement at 65)	0.051	0.045	-0.016	0.030	0.008	-0.040
<i>Missing information on retirement age</i>	-0.060	0.001	0.093	0.248	0.256 **	-0.178
<i>Have to stop before 65</i>	-0.002	-0.087 *	-0.061	-0.065	0.013	-0.191 **
<i>Missing information on `have to stop`</i>			0.050	-0.005	-0.015	-0.011

**Continuation Table 1**

Part 3 : ( $x_A$ )	Greece		Netherlands		U.K.	
	Vign.	JS	Vign.	JS	Vign.	JS
<i>Respondent job (not included in the vignette) and non-job related characteristics</i>						
Individual has lower education	-0.029	0.003	0.057 **	0.084 **	0.045	0.123 **
Individual is a male	0.024	0.024	0.091	-0.015	0.043	-0.181 **
Ln(individual's age)	0.116	0.154	-0.561	0.710	-0.583	2.140
Ln(individual's age)- Squared	-0.013	-0.031	0.073	-0.082	0.052	-0.267
Individual is married	0.035	-0.077	0.016	0.014	0.027	0.012
Ln(# of earners in the household)	0.141 **	-0.032	-0.017	-0.054	0.126 **	0.056
Individual works in the public sector	0.007	0.127 *	-0.045 *	0.039	-0.016	-0.158 *
Ln((# children under 16)+1)	0.080 *	0.030	-0.085	0.054	-0.027	-0.003
Missing information `children under 16`			0.012	-0.046	0.062	-0.004
Individual has two jobs	0.196	-0.137	-0.014	-0.044	0.044	0.000
Ln(#. weeks unemployment last year)	-0.014	0.030	0.011	-0.003	0.007	-0.025
Year of start current employer	0.003	0.001	-0.002	0.003	-0.002	0.012 **
Individual works on Sunday	0.046	-0.094	0.042	0.004	0.039	0.165 *
Individual works nights	0.006	-0.011	-0.011	0.084	-0.010	-0.073
Individual works with flexible times	0.051	-0.075	0.009	0.006	0.005	-0.026
Individual works on clocking	0.054	-0.138 **	0.064	0.012	-0.026	-0.100
Individual works on call	-0.009	0.095	0.043	0.062	0.021	0.096
Individual works with computers	-0.055	-0.013	-0.004	-0.069 *	-0.046	-0.057
Individual works with merit system	0.105	-0.069	-0.060	0.058	0.012	-0.074
Individual does not work on location	0.172	-0.052	-0.015	0.037	-0.021	0.025
Individual has career perspectives	0.072	-0.007	0.044 **	0.097	0.052	0.168 **
Individual is member trade union	-0.018	-0.073	-0.154	-0.069 *	-0.069	-0.082
Indiv. works with collective agreement	-0.095 **	-0.038	-0.048	0.025	0.027	0.096
Firm size: increasing	-0.021	0.038 *	-0.008	0.007	-0.007	-0.002
Ln(#. minutes commuting each way)	-0.004	0.007	0.028	-0.034 *	-0.008	-0.026
Desired retirement age	0.005	0.008 *	0.005	0.019 **	0.003	0.012 **
Missing information on desired retirement	-0.383	0.417	0.254	1.135 **	0.137	0.652 **
Ln(#. times injured at work)	0.006	-0.027	0.114	-0.133	-0.102	0.024
Ln(#. times sick due to work)	0.064	-0.084	-0.032 **	-0.014	0.033	-0.055
Ln(desired working hours/week)	0.014	-0.030 **	0.025	-0.024 **	-0.008	-0.032 **
Missing information `desired hours`			-0.056	-0.120 *	-0.013	-0.050
Number of Observations	3735	747	4330	865	4522	905
Number of Groups		747	872		909	
R <sup>2</sup> :		0.1513		0.2073		0.1851
	within	0.3688	0.322		0.384	
	between	0.1717	0.182		0.202	
	overall	0.3055	0.273		0.329	

**Note:** \* significant at 10%; \*\* significant at 5%

Our overall conclusion with respect to the assumption of vignette equivalence is that vignette equivalence within countries seems acceptable after correction for some aspects of the respondent's job and life situation; between countries there are some important differences to the extent that some vignette attributes and some variables describing the current job situation show statistically significant differences among countries.

### 5.1.2 Response Consistency

Response consistency is tantamount to the assumption that respondents answer similarly when asked to evaluate hypothetical jobs as when they are asked to evaluate their current jobs. This is we need to test in how far equations (4) hold. A  $\chi^2$  -test on the 51 equations simultaneously yields values of 195 for Greece, 781 for the UK, and 446 for the Netherlands. This means that in all cases the  $\text{prob} > \text{chi2} = 0.0000$  and we can reject the hypothesis of identity. When we pool all countries together the value of the  $\chi^2$  is 1405, which also implies rejection of the hypothesis of identity. Hence, the validity of (4) as a whole may be firmly rejected. It seems more informative however to differentiate response consistency per variable by testing each variable separately. Only if there is response consistency with respect to each separate variable, we can speak of overall response consistency. To test response consistency with respect to the job attributes describing the vignette ( $z$ ), we need to combine the coefficients of  $z$  and  $z_A$  in the vignette equation and to test them against the coefficients of  $z_A$  in the job satisfaction equation.

In Table 2A in the Appendix we report for each country whether the separate equalities in equation (4) have to be rejected (i.e, whether there is 'no' response consistency) or cannot be

rejected (i.e., ‘yes’, there is response consistency).<sup>3,4</sup> We conclude that there are response inconsistencies especially with respect to working hours (except for Greece), for wage, and the importance of early retirement. The first two variables appear to be very dominant for determining the individual’s choice between vignettes, but they are much less important for the evaluation of own job satisfaction. Table 2A shows that there are statistically significant differences between the way in which individuals evaluate their own job and the hypothetical jobs. This is an indication that there are two different concepts of job satisfaction: one schedule is applied to the own job, while another is applied for the evaluation of the hypothetical jobs described in the vignettes. Thus, we reject response consistency.

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<sup>3</sup> Notice that due to the difference in definition in wage as a percentage deviation of own wage in the vignette description, for response consistency in wages we have to test the equation  $\gamma = \gamma u$ .

<sup>4</sup> Due to lack of space, the values of the underlying t-test are not shown but they are available upon request. We took the correlation between estimates in the vignette equation into account. Given that the vignettes are randomly allotted to the respondents, the vignette characteristics and the individual’s own job characteristics are independent of each other, that is, the two blocks of explanatory variables are orthogonal to each other. Consequently, the estimates of the effects of the vignette attributes on the vignette evaluation are not affected by inclusion or exclusion of the individual current job situation and other individual characteristics. In addition, there was almost zero correlation between the errors of the vignette equation and the satisfaction equation. Consequently, we assumed zero correlation between the estimates of the two equations.

This result casts doubt on the applicability of vignettes to predict satisfaction with real situations. Hence, one should probably make a sharp distinction between satisfaction derived from a real situation and the factors at play when evaluating between fictitious situations.

The results suggest that there are different psychological mechanisms at work in performing evaluations of real situations and of vignettes. Our results indicate that in the hypothetical situation, where the details of the different alternatives are not well known, individuals are inclined to judge the different job situations on the basis of a few well-measurable and well-visible characteristics only, such as wages and hours worked. These are *ex ante* preferences, which seem to differ from *ex post* preferences for situations that have been already experienced in reality. One can and probably should distinguish between two important concepts: (i) the own job satisfaction function that describes how individuals evaluate their actual job (experienced or *ex post* utility); (ii) the satisfaction function that depicts how individuals evaluate a job that they may not currently perform but of which they have a superficial schematic perception only (anticipated or *ex ante* utility). Job satisfaction, in contrast with *ex ante* utility, describes individual preferences after adaptation to current job circumstances (Frederick and Loewenstein, 1999). It seems reasonable to assume that individuals base their job market decisions on the ‘anticipated’ or *ex-ante* job utility<sup>5</sup> functions that differ from what individuals will actually experience when they are employed in the specific job (*ex post* utility).

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<sup>5</sup> This concept is similar but not identical to the concept of ‘decision utility’ proposed by Kahneman, Wakker and Sarin (1997).

## 5.2 Determinants of vignette evaluations and job satisfaction

### 5.2.1 Vignette evaluations

The results presented in Table 1 show that the offered hourly wage in the hypothetical job is a very strong factor explaining the preference for a vignette. The hourly wage is here expressed as a percentage of the respondent's wage in his or her present job. The effect of the (log)-working hours on the vignette evaluation is statistically significant and it exhibits an inverted-U shape relationship with an optimum number of working hours at about 25 to 28 hours a week depending on the country. From this information one can derive the trade-off ratio between working hours and hourly wage that leaves the respondent at the same vignette utility level. The coefficients in Table 1 indicate that an increase from 38 to 39 working hours a week in a vignette would have to be compensated by a 7% increase of the percentage wage per hour in the UK<sup>6</sup>. For the Netherlands and Greece this number would be 17.25% and 2.73%, respectively. Hence, one extra hour of work implies a premium compensation in the UK of about  $39 \times 7\% \approx 274\%$ , when the hourly wage for the first 38 hours is left unchanged.

We can evaluate the other vignette attributes also in terms of compensating wages so as to evaluate the relative importance of the various job attributes included in the vignettes. For instance, the improvement corresponding to a change from a temporary contract with no possibility of renewal to a permanent contract with no likelihood of being made redundant appears to be equivalent in Greece to a wage reduction of  $\frac{0.269}{1.276} \approx 21\%$ . It implies that the premium necessary to induce someone to accept the worst contract that appears in the vignettes instead of the best type of contract we included in the vignettes is about 21%. In

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<sup>6</sup> The trade-off ratio for the UK is found by setting  $5.523\Delta\ln(\text{working hours}) -$

$0.843\Delta\ln(\text{working hours})^2 = 1.420\Delta(\%\text{wage})$ .

other words, this is the *disutility* associated to this change of contracts. The estimated preference order indicates that, except in Greece, workers prefer temporary contracts with possibility of renewal to either a temporary contract or a permanent contract that involves risk of job termination. In Greece, a permanent contract with risk of termination but with compensation is preferred to all types of temporary contracts. This reflects the worker's aversion to uncertainty regarding their future labor market status, a preference in line with the literature indicating that temporary jobs are not desirable as a means of long-term careers (Booth *et al.* (2002)) and the well-documented distress associated with joblessness (Clark and Oswald, 1994; Winkelmann & Winkelmann, 1998; Theodossiou, 1998). The working schedule appears to be a significant factor affecting the vignette preferences. Rotating shifts is seen to be the most undesirable working schedule while usual office hours are the most preferable working schedule. The organization of the work is an important determinant of vignette evaluation only in the UK, where individuals show a statistically significant preference for working in varying teams and a dislike for jobs with fixed routines. Similarly, respondents anticipate that some degree of job flexibility is preferable to fixed routine in the UK and the Netherlands. The working tempo is also relevant in the vignette evaluation: 'working under a tight deadline or at a high speed' has a clearly negative effect on the vignette evaluation and it is predicted to generate much less utility than 'never working under such stressful conditions'. Training opportunities are valued neither in the UK nor in the Netherlands: in these two countries, a job that offers opportunities for training has a significantly lower declared utility than jobs which do not offer such an opportunity. Finally, hypothetical jobs providing early retirement plans with no economic loss are seen as preferable compared to those that compel the worker to retire at 65 in all three countries. In this respect, it is interesting to notice that workers in UK and in the Netherlands appear to prefer a job "so physically demanding that they might be unable to perform it until the formal

retirement age of 65” to a job that does not provide early retirement plans. In contrast, this coefficient is negative and statistically significant for Greece.

### 5.2.2 Job Satisfaction

The job satisfaction equation includes the exact same set of variables as the vignette regressions in order to make the results comparable. As discussed in 5.1 some of the job characteristics appear to have a similar effect on both the vignette and the own job satisfaction, but many others do not.

The dislike for uncertainty regarding the type of labor contract is not confirmed: workers in Greece and in the UK do not show any clear preference for a type of contract and in the Netherlands only some type of contracts are preferred to the worse type of contract, i.e. a temporary contract with no possibility of renewal. In contrast with the vignettes results, working hours are only statistically significant in the UK, although Greek employees show a clear preference for being able to choose their working times. Work organization does not have much effect on job satisfaction except for the negative effect in Greece of not working in teams of co-workers, while it did have an effect in the vignettes evaluation. The wage coefficient, which was statistically significant in the vignettes is only positive in Greece and, to a lesser extent in the UK. The effect of wages on Dutch job satisfaction is statistically not significant. Finally, whether the firm where the employee works has early retirement plans has no statistical impact on job satisfaction, although it is an important element of the vignette evaluation function. Having a job that is physically so demanding that one needs to stop before 65, has a negative effect and is statistically significant in Greece and UK. In the vignette evaluation this variable has a positive and statistically significant coefficient for the Dutch and English respondents, and it is negative for the Greek respondents.



Training has a statistically negative effect on job satisfaction in the Netherlands and in the UK, as it has for the vignette evaluation in these two countries. There is a statistically negative effect of having a routine job in the job satisfaction of Greek and Dutch workers, as we found for the vignette evaluations of Dutch and UK workers.

## **6. Conclusion.**

In this study we examined and compared the determinants of self-reported current job satisfaction and of workers evaluation of hypothetical jobs they do not perform. Our main conclusion is that there is no vignette equivalence; there are systematic differences (e.g., depending on the country of residence and on the workers' current working situation) in the way respondents value and interpret the hypothetical jobs described in the vignettes. In addition, we find no evidence of response consistency, i.e., individuals do not value in a similar manner their current job and a hypothetical job they do not perform. This empirical finding puts into jeopardy the status of vignette evaluations as a substitute or an extension of satisfaction evaluations of own jobs. This reduces the value of vignettes as an anchoring instrument. The divergence of the individuals' own job evaluations from their vignette evaluations is explained by utilizing the concepts of *ex post* and *ex ante* satisfaction. *Ex post* or experienced satisfaction is reflected by job satisfaction questions, while vignette evaluations are steered by *ex ante* anticipated satisfaction. In evaluating the vignettes, it seems that respondents largely base their evaluations on hard measurable factors such as working hours and wage. Own job satisfaction depends also on softer variables like *type of contract*, working hours, working times, and work organization, which seem to be rather hard to visualize as being important deciding factors for evaluating fictitious jobs.

The major result of this study seems to be that we have to doubt the comparability between vignette results and the results of job satisfaction questions. This reduces the value of vignettes as an anchoring instrument.

A major advantage of studying vignettes instead of real choice processes is that vignette evaluations (or observing the choice and/or ranking between vignettes) is not constrained by adaptation. In contrast, the evaluation of experienced situations is done after workers have adapted to their current job circumstances (Frederick and Loewenstein, 1999). This study contributes to the growing literature on subjective well-being by proposing and operationalizing two different satisfaction or utility concepts, each of which adds to understanding human behavior regarding economic decisions.

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## Appendix

**Table 1A: List of attributes included in the vignettes and its possible values**

Variable	Mean	Min.	Max
<b>Evaluation Vignette</b>	4.120	0	10
<b>Type of contract</b>			
Permanent contract with no risk of being fired	0,179	0	1
Permanent contract with risk of being fired & with economic compensation	0,127	0	1
Permanent contract with risk of being fired & with no economic compensation	0,180	0	1
One-year contract with high probability of continuation with a permanent contract	0,239	0	1
One-year contract with high probability of continuation with a temporary contract (reference: One-year contract with no probability of continuation)	0,157	0	1
<b>Ln(Working hours)</b> (Working hours ranged from 20 to 50)	31.5	20	50
<b>Net wage per hour:</b> expressed as a percentage of wages at current job.	-0,020	-0,5	0,5
<b>Working times</b>			
Flexible working hours	0,169	0	1
Office working hours (you can choose which days your work)	0,283	0	1
Rotating shifts (system)	0,315	0	1
(reference: The employer decides about the working times (not in the night) and may change them monthly)			
<b>Training:</b> 1= The employer will offer you a 3 months training program in the course of the year 2= 1 month training, 3= 10 days training 4= 5 days training 5= 1 day training; 6= no training Therefore, the higher the value the variable takes, the less training the employee will receive.	3,433	1	6
<b>Work organization</b>			
Job not in teamwork	0,307	0	1
Job in varying teamwork (reference Job in fixed team)	0,319	0	1
<b>Control over own work</b>			
Job has a fixed routine	0,397	0	1
Can choose order tasks: job tasks are fixed, but you may decide when & how things are done (reference: No one controls your work)	0,335	0	1
<b>Intensity due to high speed</b>			
Often high speed	0,243	0	1
Sometimes high speed (reference: never working at high speed)	0,158	0	1
<b>Intensity due to tight deadlines</b>			
Often tight deadlines	0,158	0	1
Sometimes tight deadlines (reference: never working with tight deadlines)	0,169	0	1
<b>Retirement &amp; Labour disability</b>			
Have to stop before 65 (have to stop before 65 because the job is physically very demanding)	0,116	0	1
Early retirement 55 (firm has early retirement plans)	0,199	0	1
Early retirement 60 (firm has early retirement plans) (reference: the firm has no early retirement plans)	0,241	0	1
<b>Loyalty-no shirking:</b> Loyalty from both sides; shirking & low performance impossible	0,570	0	1
Dummy variables for countries: Netherlands, UK, and Greece			

**Table 2A: Consistency between vignettes and job satisfaction**  
(based on results from Table 1)

<i>Variables describing the vignette &amp; the respondent current job situation related to the vignettes</i>	<b>Is there response consistency?</b>		
	<b>Gr</b>	<b>NL</b>	<b>UK</b>
<b>Wages</b>	No	No	No
<b>Type of contract</b>			
Perm. cont. with no risk	Yes	Yes	Yes
Perm. cont. with risk but compensation	Yes	Yes	Yes
Perm. cont. with risk & no compensation	Yes	Yes	Yes
Temp. cont. to perm. Cont	Yes	Yes	Yes
Temp. cont. to temp. cont (ref. Temp.cont.to unempl.)	Yes	Yes	Yes
<b>Ln(Working hours/week)</b>	Yes	No	No
<b>Ln(working hours/week)^2</b>	Yes	No	No
<b>Working times</b>			
Office working hours	Yes	Yes	No
Working times decided by employee	Yes	Yes	Yes
Rotating shifts (ref. work. times decided by employer)	Yes	Yes	Yes
<b>Training</b>	Yes	Yes	Yes
<b>Work organization</b>			
Job not in teamwork	Yes	Yes	Yes
Job in varying teamwork (ref. Job in fixed team)	Yes	Yes	No
<b>Control over own work</b>			
Job has a fixed routine	Yes	Yes	Yes
Can choose order tasks (ref. no one controls your work)	Yes	Yes	Yes
<b>Intensity due to high speed</b>			
Often high speed	Yes	No	No
Sometimes high speed (ref. never working at high speed)	Yes	Yes	Yes
<b>Intensity due to tight deadlines</b>			
Often tight deadlines	Yes	Yes	Yes
Sometimes tight deadlines (ref. never working with tight deadlines)	Yes	Yes	Yes
<b>Retirement</b>			
Early retirement 55	Yes	No	Yes
Early retirement 60 (ref. retirement at 65)	No	No	No
Have to stop before 65	Yes	No	No

**Continuation Table 2A: Is there response consistency?**

<i>Respondent job and non-job related characteristics</i>			
Individual has lower education	Yes	Yes	Yes
Individual is a male	Yes	No	No
Ln(individual's age)	Yes	Yes	Yes
Ln(individual's age)- Squared	Yes	Yes	Yes
Individual is married	No	Yes	Yes
Ln(#. earners in household)	No	Yes	Yes
Individual works in public sector	No	Yes	Yes
Ln(# children under 16+1)	Yes	No	Yes
Missing infor. `children under 16`	Yes	Yes	Yes
Individual has two jobs	No	Yes	Yes
Ln(#. weeks unempl. last year)	No	Yes	Yes
Year of start current employer	Yes	No	No
Indiv. works on Sunday	No	Yes	Yes
Indiv. works nights	Yes	Yes	Yes
Indiv. works with flexible times	Yes	Yes	Yes
Indiv. works on clocking	No	Yes	Yes
Indiv. works on call	Yes	Yes	Yes
Indiv. works with computers	Yes	Yes	Yes
Indiv. works with merit system	Yes	Yes	Yes
Indiv. does not work on location	Yes	Yes	Yes
Indiv. Has career prespectives	Yes	Yes	No
Indiv. Is member trade union	Yes	No	Yes
Ind. works w collective agreement	Yes	Yes	Yes
Firm size: in increasing	No	Yes	Yes
Ln(mint. commuting each way)	Yes	No	Yes
Desired retirement age	Yes	No	No
Missg. infor. `desired retirment`	No	No	No
Ln(#. times injured at work)	Yes	No	Yes
Ln(#. times sick due to work)	Yes	Yes	Yes
Ln(desired working hours/week)	No	No	Yes
Missg. infor. `desired hours`		Yes	Yes