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Image and Reality: the Case of Job Satisfaction

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Abstract

This study makes a distinction between two types of utility. Experienced utility is defined as the job satisfaction derived from the present job, estimated by using a subjective evaluation of job satisfaction. Anticipated utility is defined as the individual's anticipated job satisfaction before starting the job and it is studied by using a stated preference methodology known as conjoint analysis. The results suggest that the two utility concepts are different. Information about experienced utility is useful for the evaluation of well-being policies and the welfare effects of various employer strategies. Anticipated utility provides knowledge about the job search process.

1. Introduction

Following the work of Locke (1969), Hamermesh (1977), Freeman (1978) and Borjas (1979), economists have become increasingly interested in issues related to the subjective evaluation of satisfaction derived from work. For brevity, we label it job satisfaction. Job satisfaction is related to gains in efficiency at an organizational and an individual level. Higher job satisfaction is likely to result in higher efficiency at work and hence in a higher performance of the organization as a whole (Wright *et al.*, 2002). The literature provides evidence for a strong relationship between job satisfaction and specific characteristics of the individual and of the job, such as, gender, age, education, wages, working hours, trade union status, establishment size, and job security[1]. The utility workers derive from their job can be operationalized and measured by the concept of job satisfaction.

Following Kahneman, Wakker and Sarin (1997), we define experienced or *ex post* utility to be the satisfaction derived from the present job. Thus, job satisfaction is a measure of psychological well- being at work, experienced in performing the current job. As such, it is a wide-ranging concept since it concerns individual feelings about every day activity in the current job and these feelings are neither constant nor irreversible. They depend on the current work environment. They are subject to a process of adaptation and coping (Frederick and Loewenstein, 1999), and they are contaminated by cognitive dissonance (Festinger, 1957)[2]. In the present context cognitive dissonance is the internal conflict that is caused by the gap between what one aspires and expects from the job as conducive to well being at work and the reality of the job that he or she actually performs. Individuals feel compelled to try to eliminate the dissonance, so as to create a *happy* life. They do this by changing their norms. An example similar to that used by Festinger (1957) may assist in elucidating this

[1] See, among others, Borjas, 1979; Freeman and Medoff, 1984; Brockner et al, 1988;Brockner, 1992; Lillydahl and Singell, 1993; Lang and Johnson, 1994; Clark and Oswald, 1996; Clark, 1997; Drakopoulos and Theodossiou, 1997; Blanchflower and Oswald, 1999; Burchell et al 1999; Groot and Maassen van de Brink, 1999; Ward and Sloane, 1999; Sloane and Williams 2000; Kaiser, 2002; Lydon and Chevalier, 2002; Moguerou, 2002; van Praag and Ferrer-i-Carbonell, 2004; Clark, 2005; and Pouliakas and Theodossiou, 2005.

[2] The theory of cognitive dissonance suggests that contradicting elements of knowledge (cognitions) serve as a driving force that compels the human mind to modify existing beliefs. The existence of dissonance, being psychologically uncomfortable, motivates the person to reduce the dissonance and

issue. Suppose that a worker believes that staying at home during the evenings and nights is very important for a happy family life. Suppose that the firm in which he or she is employed all of a sudden introduces night shifts. The worker will experience dissonance, because the knowledge that he/she will work at night is dissonant with his or her opinion about family life. He/she can then reduce the dissonance by either refusing to work in night shifts or by *changing* his/her opinion on what is important for a happy family life.

In the light of such psychological processes, the evaluation of the effects of any job characteristic on individual job satisfaction is troublesome. Opinions on the current job are molded and contaminated by present reality. Therefore, one can distinguish between two important concepts; a utility function that describes how the individual evaluates his/her actual job (experienced or *ex post* utility); and a utility function that depicts how the individual perceives a job, which he or she is not performing. It seems reasonable to assume that individuals base their job market decisions on *'anticipated'* or *ex-ante* utility[3].

This paper is a first attempt to operationalize *ex ante* (job) utility and to compare it with *ex post* or experienced (job) utility. In the literature *ex post* or experienced utility is empirically estimated by asking for the worker's own satisfaction with his or her current job. In order to study anticipated or *ex ante* utility we use a stated preference methodology known as conjoint analysis (Green and Srinivasan, 1978; Green *et al*., 2001). This involves choices or evaluation responses by an individual concerning various hypothetical jobs.

This study contributes to the growing literature on subjective well-being. At this stage of the research agenda, it is crucial to understand and operationalize the two different utility concepts, each of which adds to understanding human behavior regarding economic decisions.[4]

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leads to avoidance of information likely to increase the dissonance. The greater the magnitude of the dissonance, the greater is the pressure to reduce dissonance.

[3] This concept is similar but not identical to the concept of 'decision utility' proposed by Kahneman, Wakker and Sarin (1997).

[4] However, the question remains what is the predictive value of preference estimation, based on reactions to vignettes. It may be that real world choice behaviour, where respondents are actually faced with the choice between jobs A or B will differ from the choice respondents make when they are asked

This paper is structured as follows: In Section 2, the theoretical and empirical settings of the paper are presented. The Section 3 we describe the data used in this study. Section 4 discusses the econometric methodology. In Section 5, the conjoint analysis results reflecting the concept of the anticipated or ex *ante* utility are discussed. In Section 6, these results are compared to the results on experienced or *ex post* utility, which are derived from the conventional approach of satisfaction analysis. Section 7 concludes.

2. The Theoretical Setting

2.1 Conjoint analysis

Conjoint analysis makes use of so-called 'vignettes' (see Figure 1). In the present context these are short descriptions of hypothetical jobs, which are described by their main characteristics or attributes.

One can ask the respondents to evaluate those jobs on a numerical scale or to order them according to anticipated satisfaction. This choice approach is rooted in random utility theory (McFadden, 1973; Hanemann, 1984, Van Beek , Koopmans, Van Praag 1997) and conjoint analysis (Green, 1974; Green and Srinivasan, 1978; Louviere and Woodworth, 1983; Green, Krieger and Bansal, 1988; Elrod, Louviere, and Davey, 1992; Green, 1995). The advantage is that individuals are not restricted to evaluating only their own present job, but that they may evaluate other jobs described by vignettes as well.

HERE FIGURE 1

Presenting vignettes to respondents may be seen as a controlled experiment, comparable to those in experimental psychology. The vignette is the stimulus and the response is the reaction by the respondent. The creation of such vignettes is not trivial. It involves four steps.

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to evaluate the two hypothetical vignettes A and B. This issue is far from settled by the relevant literature. Yet, a significant number of studies have shown that stated preferences and revealed (actual) preferences seem to fit surprisingly well in different choice contexts, cultures and time periods Louviere *et al*. (2000).

The first step is to identify the relevant job characteristics, or the so - called *attributes* in the conjoint terminology. Such attributes are, e.g., the salary, working hours, job security and the like. The second step is to assign various values or levels to the attributes like the amount of salary, the number of working hours,etc.. The levels must be credible, thus encouraging respondents to take the exercise seriously. The third step is the design of the vignettes. Given the selected job attributes and level possibilities, a number of vignettes that describe possible jobs are drawn up. The number of vignettes increases rapidly with the number of characteristics and the number of distinct levels /values. However, since a respondent has only a finite span of attention, only a few vignettes can be included in each individual questionnaire. Experimental design is used to reduce the number of vignettes to a feasible number per respondent and to create a discrete grid over the space of potential vignettes. The final step is to establish the preferences from the response.

Usually, preferences for the vignettes included in a questionnaire are elicited by using one or more of three methods: ranking, rating, or discrete choices. In the ranking approach, respondents are asked to list the vignettes in order of preference. This provides an ordering, but it does not offer any information about differences in the strength in preferences. It yields an ordinal utility ordering. In the discrete choice method, respondents are asked to consider a set of vignettes and they are invited to choose their preferred one. This method yields less information than the ranking method, as it reveals only which of the alternatives ranks highest, but it does not reveal any information about the ordering of the less than optimal alternatives. The rating method requires the respondents to assign a score of, say 1 to 10, to each of the vignettes. The rating method yields a cardinal preference ordering. In light of practical experience with ratings, it appears that respondents do not have problems to rate alternatives on a numerical scale, where equal differences in rates are set equal to equal utility differences. It should be mentioned that all three types of response behavior are subject to random errors in individual responses. Hence, a random error term has to be included in any empirical model.

2.2 The utility model: *Estimating the anticipated (ex ante) and the experienced (ex post) job satisfaction*

The methodology for estimating anticipated or *ex ante* job satisfaction follows the now classical theory of Lancaster (1966, 1971) and Rosen (1974). Hence, the present study postulates that job satisfaction is derived from a vector *z* of characteristics (attributes), that describe a job. The extent to which an individual derives satisfaction from a job depends on the levels of these job characteristics.

A specific job *j* is described by a vector of attributes z_j. This description is contained in a job *vignette*. Thus utility $U(z_j)$ from work, i.e. satisfaction derived from a job, is

$$U(z_j) = U(z_{1j}, z_{2j}, z_{3j}, ...) \tag{1}$$

where z_{ij} is the value of the ith characteristic that a worker faces in job *j*.

Individuals are indifferent between two jobs *j* and *j'* if $U(z_j) = U(z_{j'})$. Knowledge of the function *U*(.) makes it possible to calculate the so-called trade-off ratios defined as the extent to which an individual may accept less of one job characteristic when he or she is compensated by an increase in another job characteristic, without his or her overall job satisfaction being affected. The trade-off ratio between attributes *j* and *j'* is $\dfrac{\partial U}{\partial z_j} \bigg/ \dfrac{\partial U}{\partial z_{j'}}$.

Different individuals will have different opinions about the same job. In order to take this feature into account equation (1) can be individualized as follows:

$$U(z_j) = U(z_1, z_2, z_3 ... z_{j'}; x_n) \tag{2}$$

where x_n is a vector of personal characteristics of the nth respondent.

Furthermore, in addition to personal characteristics, the characteristics of the individual's own current job, z_n, may also co-determine the valuation of a vignette. Thus, for instance, workers who work in night shifts and have adapted their life to the requirements of such a job may be more positively inclined to a job with nightshifts than a respondent who works only in a regular daytime job. The issue here is that when individuals evaluate jobs, their responses may be affected by the characteristics of their own current job. Hence, the individual responses may be contaminated by cognitive dissonance or adaptation due to the individual's experience with his current job.

Consequently, equation (2) is augmented as follows:

$$U(z_j) = U(z_j; x_n, z_n) \qquad\qquad (3)$$

where z_n is the vector of own- job- characteristics of the individual n. If z_n affects the evaluation of the hypothetical vignettes, then the methodology should take this into account.

The methodology for estimating the experienced or *ex post* job satisfaction follows the conventional job satisfaction analysis (for instance, Freeman, 1978; Clark and Oswald, 1996; Drakopoulos and Theodossiou, 1997; Hamermesh, 2001; and Van Praag and Ferrer-i-Carbonell, 2004). This approach yields a relation between the characteristics of one's own current job (z_n), the individual's personal characteristics (x_n), and the corresponding job satisfaction by a 'satisfaction function', $S(z_n; x_n)$. Besides estimating equation (3), we estimate a conventional job satisfaction model that reflects the individual's experienced or *ex post* job satisfaction.

Furthermore, we want to investigate whether the evaluation of the individual's own job on the basis of vignettes is consistent with the job satisfaction derived from the conventional job satisfaction function, that is, whether

$$U\ (z_n; x_n, z_n) \equiv S(z_n; x_n) \tag{4}$$

If this is not the case, it follows that one has to assign different interpretations to *ex ante* utility *U* and experienced utility *S* as discussed in Section 1.

3. The data

3.1 The survey method

The data for this study are derived from identical surveys, carried out between July and September 2004 among workers in lower- and middle-skilled occupations in Greece, the Netherlands, and the U.K.[5]. For the Netherlands and the UK an Internet survey is used[6]. For Greece where the Internet penetration is very low and an Internet survey does not achieve representativeness face-to-face interviews are used. Apart from this difference the remaining parameters of the surveying methodology in all three counties are the same. However, due to the financial costs of the face-to-face interviews the sample for Greece includes 800 observations, while there are 1000 observations for the Netherlands and United Kingdom each.

Given the financial restrictions, the research was targeted on some specific social groups in order to obtain relatively large cell fillings. The sample consists of employed individuals, both part- time and full-time, and individuals who are in training programs but whose main activity is 'working'. Finally, the survey excludes students and self-employed individuals and individuals in the agriculture or fishery sectors.

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[5] This dataset is derived from a survey carried out in Denmark, Finland, France, Greece, the Netherlands, Spain and the U.K, which is financed by the European Commission through the EPICURUS project coordinated by I. Theodossiou. The central theme of the project is to obtain more insight in the labour conditions of European citizens and how these conditions influence quality of life. Only the surveys for Greece, the Netherlands and the UK are carried out by the same company. Hence, only the data for these three countries are used in this study. The survey was carried out by the INTERVIEW♦NSS (http://www.interview.nl/) a Dutch-based company with wide experience on surveys in the Netherlands and around the world. See also Kristensen and Johansson (2005), based on the same data set.

[6] Although the face- to- face interview is the better method to survey the financial costs are proven to be prohibitive for these countries.

Furthermore, as described in Section 2.1, the use of conjoint analysis involves presenting the respondents with a set of hypothetical jobs that they have to evaluate. Hence, the hypothetical jobs should be realistically described in order that the respondents take the evaluation task seriously. In addition, the characteristics to be included in the job description should be the most relevant ones for the determination of job satisfaction. To satisfy the above requirements the survey targets on workers with low or middle education. Individuals with an education level 5 or 6 (ISCED International Classification 1997) are excluded. This is a well-defined and homogenous group of workers. One important reason for this choice on education as the selection variable is that the occupational classification is very diverse among the three countries but that the education level is similarly defined. Further, evidence suggests that occupation and education are highly correlated.

The survey methodology for the Internet respondents in the UK and the Netherlands is as follows: Individual respondents are obtained from the databases which are maintained by the interviewing company. Prior to the survey, all the individuals selected received an invitation in which they are asked whether they would be willing to participate in a survey. They are also provided with a brief outline of the study. No complaints regarding the structure or the clarity of the questionnaire and the vignette matterial have been reported to the company carrying out the survey, which is a rather rare experience for this kind of surveys.

3.2 The sample

After conducting the survey, the database was carefully scrutinized to ensure its representativeness with regard to the targeted populations. The result of a primary analysis was that the net sample adequately represents the targeted population.

3.3 The main questions

The vignettes

In addition to the usual question modules regarding personal and job characteristics a considerable part of the questionnaire is devoted to the presentation of the vignettes to the

respondent. Each hypothetical job (vignette) is described by a set of job characteristics, also known as job attributes. In Table 1 a list of all the possible job attributes is given. The description in Figure 1 is a simplified version of the vignette, which was shown to the respondent. It is evident that the set of specific attributes chosen to be included in the vignettes is by no means an exhaustive characterisation of a job. A full characterization of a real job situation is clearly an impossible task. However, the chosen set is sufficiently informative for the purpose and the focus of this paper. Importantly, in the vignettes the individual's 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 different wages have to evaluate the same vignettes. A wage increase of €1000 per month is evidently differently perceived by an individual who earns €1000 per month than by someone who earns €5000 a month.

HERE TABLE 1

Figure 1 shows that each vignette includes 10 job attributes, each of which takes different values. For example, the job attribute 'type of contract' takes 6 different values. This implies that each job vignette includes the description of one of the 6 possible types of contracts. Table 1 also details information about the percentage of vignettes that include the given type of job characteristics. For example, all vignettes have a description of the type of contract and 17.9% are assigned the value 'Permanent contract with no risk of being fired'. A awkward problem here is the description of the type of contract. We had to include the value "permanent contract with risk on losing the job…' At first sight this description sounds paradoxical. However, reality shows that permanent contract are not so permanent, as there are the risks of being fired for external reasons, requiring labor cost reductions from the firm and/or qualitative changes in the labor force. One of the attributes, the last one, is shown for completeness in Figure 1, but it is not used in the following analysis.

In order to keep the structure of each vignette simple, readable, and easy to understand, the vignette text that first appears to the respondent is fairly short. An example of a typical

vignette is shown in Figure 1. This shorthand description facilitates the respondent's task of comparing the five vignettes supplied. However, this can potentially pose a problem, as some attributes cannot be adequately explained by means of a few words. In order to solve this problem, some attributes are further explained by including an additional information facility. In the Internet version of the questionnaire, the respondent is able to click and to obtain extra information, while in the face-to-face interviews[7] the respondent is able to request further information from the interviewer[8].

The vignette description is completed by indicating to the respondent that all the other aspects of the hypothetical job, except for the dimensions explicitly mentioned in the vignette, are similar to the respondent's own present working conditions.

The total sample included 95 different vignettes. The vignette set is split up into 19 sub-sets of 5 vignettes each, since we expected, based on trials, that this number is the maximum number that could be presented to a respondent in an Internet survey, still maintaining a satisfactory response. The set of 95 vignettes was randomly divided into subsets of five vignettes. Those sets of five vignettes were allocated over the respondents at random. Respondents were asked to evaluate the vignettes on a 0 to 10 scale. Although the five vignettes were supplied in a specific order, respondents could review each of the five vignettes as often as they liked by going backwards and forwards on the screen in order to compare the vignettes. With this procedure the problem of ordering - effects is eliminated. A similar approach was followed in the face-to-face interviews.

Table 1 shows that the average vignette rating is 4.12 on the 0 to 10 scale. Looking at each country separately, the highest value is reported for Greece closely followed by the Netherlands. The lowest average rating is in the UK.

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[7] The text of this extra information can be provided by the authors on request.
[8] For example, while at first the respondent only sees on the screen "Retirement: You can retire at age 60", the respondent can click and obtain the following information: "This company has early retirement plans. This means that you will be able to build up a pension in such a way that you can retire at age 60 without any economic loss". Similar facility is available for all other job attributes.

The job satisfaction with own job

Prior to presenting the respondents with the vignettes but after asking them a set of questions about their own job situation, the respondents are also asked to evaluate their own job satisfaction on a 0 to 10 scale. This now traditional question module is shown in Figure 2. This question is often used in the literature to prompt individuals to evaluate their own job satisfaction. In this study, the response to this question is considered as an adequate description of the *ex-post or experienced* utility.

HERE FIGURE 2

The average reported job satisfaction for the whole sample is 6.843. The highest job satisfaction is reported in the Netherlands with 7.325. The lowest is for the U.K., which averages 6.346. The differences among countries are larger than for the evaluation of the vignettes.

The control variables

In addition to the vignettes and the job satisfaction question the survey questionnaire includes a wealth of details regarding the respondent's current socio-economic and job situation. This information is used to explain the individual's anticipated (*ex ante*) and experienced (*ex post*) job evaluations. The main set of variables relates to the respondent's current job characteristics. In addition, in order to be able to control for other individual and household characteristics, the survey includes a large set of control variables, such as education, age, gender, and number of children and the like.

4. Empirical approach
4.1 The Vignettes

The evaluation of the vignettes is given by the respondent and can be described by an evaluation function

$$U_{jn} = U\ (z_j, x_n) \tag{5}$$

where z_j is the vignette[9] j, and x_n represents individual characteristics of individual *n*. A respondent can only rate the vignettes on a discrete scale 0, 1, 2,…,10. Hence, the evaluation *U* cannot be observed exactly, but only as a rounded-off value.

In the literature, such a model is often analyzed by means of an Ordered Probit or a Ordered Logit model. However, following Van Praag and Ferrer-i-Carbonell, 2004 the present study utilizes the Cardinal OLS (COLS) approach[10]. This method can take into account the probable correlation between the five vignette responses in a simple way. Moreover, it simplifies computations and it reduces the computer time needed by about a factor 100. The outcomes are practically equal to the results found by means of Ordered Probit or Logit. The COLS- method takes into account the cardinal character of the information provided by the respondent. A practical difficulty is that the respondents can only provide rounded-off approximations of their true evaluation in the framework of this questionnaire. This implies that a vignette evaluation cannot be observed exactly.

COLS assumes that the vignette is evaluated by an evaluation function of the type $N(u_{nj};0,1)$ scaled up by 10, where $N(.;0,1)$ is the standard normal distribution function. Furthermore, it is assumed that for a vignette that is evaluated by, for example, 6 on a discrete scale the true evaluation will be situated in the interval $0.55\ < U_{nj} \le 0.65$. It follows then for $u_{nj} = N^{-1}(u_{nj};0,1)$ that $u_{0.55}\ < u_{nj} \le u_{0.65}$, where $u_{0.55}\ ,u_{0.65}$ are the 55% - and 65%- quantiles of the normal distribution. Although the exact value of u_{nj} is not observed, one observes the interval within which the exact value is to be found.. Sticking at the case of a response '6' in the COLS approach the value of u_{nj} is replaced by a proxy $\hat{u}_{nj}$, which is

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[9] Before running the survey, the vignette set was checked for linear dependencies .

[10] See also Van Praag, Frijters, Ferrer-i-Carbonell (2003) and Van Praag, Ferrer-i-Carbonell (2004, chapter 2) for further methodological elaborations.

obtained by minimizing the expression $\frac{1}{N(u_{0.65}) - N(u_{0.55})} \int_{u_{0.55}}^{u_{0.65}} (u - \hat{u})^2 dN(u)$. The term

$(u - \hat{u})^2$ may be seen as the squared error of replacing the true u by the proxy $\hat{u}$. The

marginal utility- weighted average of the squared errors over the interval is obtained.

Differences count heavier the more utility mass is involved. The minimizing $\hat{u}$ is now found to

be $\frac{1}{N(u_{0.65}) - N(u_{0.55})} \int_{u_{0.55}}^{u_{0.65}} u \, dN(u)$, in other words the conditional mean over the interval.

The unknown u_{nj} is replaced by its conditional expectation $\hat{u}_{nj}$, which for the normal

distribution is the following expression[11]

$$\hat{u}_{nj} = E(u \,|\, u_{0.55} < u \leq u_{0.65}) = \frac{n(u_{0.55}) - n(u_{0.65})}{N(u_{0.65}) - N(u_{0.55})} \tag{6}$$

It is obvious how this transformation goes for other responses; say '5' or '8'. Having replaced

each response by its corresponding conditional quantile expectation, OLS is applied on the

linear model:

$$\hat{u}_{nj} = \beta' z_j + \gamma' x_n + \beta_0 + \varepsilon_n \tag{7}$$

where $\hat{u}_{nj}$ is the transformed evaluation of vignette j given by individual n and ε_n is the error

term.

It has been shown (Van Praag and Ferrer-i–Carbonell, 2004, 2005) that the parameter

estimates (except the constant term and dummy effects) obtained by the above procedure are

nearly identical to those that are obtained by Ordered Probit, except for a factor of

proportionality. Furthermore, there is no loss of efficiency, as the t- values are approximately

the same. It is important to note that the 'trade-off'-estimates (β/γ) are not dependent on the

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[11] These truncated expectations can be found, for example, in Greene (1991), Ch.20. See also Maddala, (1983, p.366) and Wooldridge (2002).

specific method used[12], as the simplified procedure outlined above entails a specific monotonic labeling convention and both labeling rules are monotonic transforms of each other.

The regression analysis of the vignettes needs to take into account that for each individual five probably correlated responses are observed. Therefore, an individual random effect is introduced, which changes across individuals but which is the same for all the five vignettes answered by the same individual:

$$\varepsilon_{nj} = \varepsilon_{n.} + \eta_{nj} \quad ,$$
(8)

where the first term is the random individual effect and the second term is the usual white noise. Assuming that $E(\varepsilon_{n.}) = 0, E(\eta_{nj}) = 0, E(\varepsilon.\eta) = 0$, one may apply the usual random effect model of panel analysis on the five vignette evaluations given by each individual:

$$\hat{U}_{nj} = \beta'z_j + \gamma'x_n + \varepsilon_{n.} + \eta_{nj} \qquad (j=1,...,5)$$
(9)

4.2 Job satisfaction

Similarly to the evaluation of the vignettes, own- job satisfaction reported by the respondent can be described as

$$S_n = S(z_n; x_n)$$
(10)

where z_n stands for the individual's own job characteristics, and x_n represents other characteristics of individual *n*. As for the vignettes, the responses to the job satisfaction question are discrete observed on a 0 to 10 scale. In the literature this model is often

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[12] In Ferrer-i-Carbonell and Frijters (2004) the model does not use the regression approach. The results obtained, namely that the trade-off ratios are almost equal, irrespective of the specific distributional

regressed either by using (Ordered) Probit and Logit models or OLS. for reasons of comparability the COLS method is used here as well (see section 4.1).

5. Results

The results are presented in Table 2. First, the findings with respect to anticipated or *ex ante* job satisfaction are discussed. They are presented in the first two columns of Table 2. Second, the empirical results regarding experienced or *ex post* job satisfaction, presented in the third and fourth column of Table 2, are considered. All estimations include country fixed effects. Finally, the two concepts are compared and the implications of the empirical findings are discussed.

5.1 The effect of job attributes on anticipated (*ex ante)* job satisfaction

The effect of the different hypothetical job attributes on the *ex ante* (hypothetical) job satisfaction (evaluation) is studied after controlling for the individual's personal characteristics and current job (X_n and Z_n in equation (3)). The reason for this is that the heterogeneity with respect to the individual's current working experiences should be taken into account in this analysis . One may expect that a respondent's evaluation of the same vignette will depend on his or her own current work conditions. However, preliminary investigation showed that the effects of the vignette attributes on the vignette evaluation are not affected by whether or not the individual current job characteristics (X_n and Z_n) are included in the regression. This is an implication of the fact that the vignettes are randomly allotted to the respondents without any reference to the individual characteristics, which implies block-orthogonality.

The results presented in Table 2[13] show that the offered hourly wage is a very strong factor explaining the preference for a vignette. The hourly wage is expressed as a percentage of the wage of the respondent's present job. The effect of the (log)-working hours on the vignette evaluation is statistically significant. We find that there is an inverted U-shape with an

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assumptions, is similar to the statement above.

[13] The reader will notice that the "Behavioral norms" attribute has been omitted in the regression of the vignette evaluation. This has been done in order to facilitate the comparison with the Job Satisfaction regression. Including this attribute leads to very similar results (available upon request) as the ones presented here.

optimum at about 27 hours a week. From this information one can derive the trade-off ratio between hours and income that leaves the respondent at the same utility. Thus, an increase from 38 to 39 working hours a week would have to be compensated by a 1.31% increase of the percentage wage per hour[14]. This implies that one hour overtime goes at a premium compensation of $39 \times 1.31\% \approx\sim 50\%$, when the hourly wage for the first 38 hours is left unchanged.

Similarly, a change from a temporary contract with no possibility of renewal to a permanent contract with no likelihood of being fired appears to be equivalent to a wage reduction of $\frac{0.316}{1.271} \approx 25\%$ [15]. It implies that the premium necessary to induce someone to accept a temporary contract instead of a permanent contract with no probability of job termination is about 25%. This mirrors the *disutility* associated with the replacement of a permanent contract with no risk of losing the job by a temporary one with no option for renewal. The preference order indicated by the type of contract indicates that workers prefer temporary contracts with possibility of renewal to either a temporary contract or a permanent contract, involving any risk of job termination. This reflects the worker's aversion to uncertainty regarding their future labor market status.

Working times are also a relevant factor for explaining the anticipated or *ex ante* job satisfaction. Working on rotating shifts is clearly the most undesirable working schedule. Individuals appear to prefer the usual office hours to all other working schedules.

Opportunities for training at work appear to be positively evaluated by this sample of low- and middle- skilled workers. As for the work organization, individuals show a statistically significant preference for working in varying teams. Workers appear to anticipate that their job satisfaction would be higher, if the job tasks would not involve a fixed routine. They prefer on one hand some degree of job flexibility but on the other hand are wary of total control over all

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[14] The trade-off ratio is found by setting 6.142Δln(working hours) – 0.929Δln(working hours)^2 = 1.271Δ(%wage).

job tasks, being a rather stressful requirement. This is compatible with an other finding, namely that, as one would expect, 'working with tight deadlines and at high speed' is much less valued than 'never working under such stressful conditions'. Jobs providing early retirement plans[16] are clearly preferred to those that compel the worker to retire at 65 years of age. In this respect, it is interesting to notice that workers appear to prefer a job, that is so physically demanding that he or she might be unable to perform it until the formal retirement age of 65, to a job, that does not provide early retirement plans. This implies a very strong preference for early retirement.

5.2. The experienced (*ex post*) job satisfaction

The results of the conventional job satisfaction equation are now briefly discussed. As far as possible, the job satisfaction regression includes the same set of variables as the vignette regressions. As found from the vignette evaluations, the results show that workers dislike uncertainty regarding their labor market status. Thus, workers appear to dislike a permanent contract that does not eliminate the risk of losing the job and does not offer severance pay, even when compared to temporary contracts with no possibility of renewal. Indeed, workers show a clear preference for a permanent contract with no risk of losing the job above all other type of contracts. Surprisingly, neither working hours nor monthly income are statistically significant. Workers appear to prefer flexible working hours above all the other options. This is followed by routine office working hours. The rotating shifts schedule has a positive but statistically insignificant effect on job satisfaction.

Training at work is positively associated with satisfaction. Jobs that require workers to work with a fixed team of co-workers are preferred to those with a varying team or those that do not involve working in teams. Control over own work does not appear to affect job satisfaction and workers do not appear to exhibit any aversion to a high work speed. Workers are shown to dislike being employed in a job so physically demanding that they might be unable to perform it until the formal retirement age and workers in firms which offer early retirement

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[15] Notice that if the sign of the trade-off ratio is positive, it implies a wage reduction, while a negative sign implies a wage increase.

plans do not show a higher job satisfaction compared to being employed in firms which offer early retirement plans. The latter findings, especially when compared to the effects in the ex ante equation are a clear sign that people adapt to their own work conditions, reducing the cognitive dissonance.

5.3 Comparing *ex ante* with *ex post* job utility

From the point of view of this study the comparisons of the coefficient of the job satisfaction regression with the corresponding ones in the vignette evaluation regression provide an assessment on whether job characteristics like type of contract, wages, and working hours affect *ex ante* and *ex post* job satisfaction in the same way. The differences between the estimates in the left and right half of Table 2 indicate that the two job satisfaction concepts are different. As an initial test regarding the difference of the two concepts a Kolmogorov-Smirnov (K-S) non parametric test is applied to test whether the job satisfaction evaluation derived from the vignette evaluation and the conventional job satisfaction evaluation derived from the respective question come from the same model equation. The K-S test rejects this assumption.

The striking feature of the results presented in Table 2 is that many of the job attributes do not affect the anticipated (ex-ante) job satisfaction and experienced (ex-post) job satisfaction in similar manner. This suggests that the individual's anticipated perceptions about the effect of job characteristics on his or her wellbeing at work differ from the experienced effect that these characteristics have in reality. This implies that there are important psychological mechanisms at work, since ex ante job perceptions appear to change when the individual becomes accustomed to his present circumstances. The results suggest that the individual's perception about his or her well-being at work is affected by hedonic adaptation and cognitive dissonance[17].

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[16] The worker builds his or her pension in a way that he or she can retire before 65 without economic loss.

In detail, the results offer some interesting insights on these issues. Thus, workers appear to have a clear preference for permanent contracts, which are free of risk of job loss. The significance of this preference is paramount for both concepts of job satisfaction. However, aversion of the risk of job loss[18] appears to dominate the determination of *ex ante* job satisfaction. This is not so for *ex post* job satisfaction, where the effect is not significantly different from the effect of dead end temporary contracts (the reference category). A permanent contract with risk of job loss and no compensation is more damaging to the individual's experienced job satisfaction compared to a dead end temporary contract, Yet, this is not the case for the *ex ante* job satisfaction. All this seems to suggest that the anticipated (ex ante) effect of the risk of job loss seems to be much more important than the experienced effect of this attribute on those who currently hold such jobs.

Similarly, working hours are important in determining anticipated job satisfaction, but they do not appear to play an important role in determining experienced job satisfaction. *Ex ante* and *ex post* workers appear to have a clear preference for flexible or office working hours above strict working hours schedules to be fixed by the employer. However, 'rotating shifts' have detrimental effects on anticipated job satisfaction but no significant effect on experienced job satisfaction. This result suggests that workers are able to adapt to rotating shifts, once they have obtained such a job. Interestingly, although working in a fixed work team has a negative influence on *ex ante* job satisfaction, this is not so for experienced job satisfaction, where neither working alone nor working in varying teams has effect on those who currently are employed in such jobs. Hence, individuals are negative *ex ante* about working in fixed teams or when they do now know who are the co-workers who constitute the team, but once in a team they adapt and feel satisfied.

The availability of training affects both concepts of job satisfaction positively. Having control over own work does not have an impact on the individual's *experienced* job satisfaction.

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[17] One may argue that another interpretation is that respondents select their jobs according to their preferences to begin with. However, in this case the question arises; why should people evaluate vignettes, describing virtual jobs, different from the way they evaluate their real job?

[18] As reflected in contracts: Permanent with risk of job loss but with compensation, temporary with possibility to permanent and temporary with possibility to another temporary contract.

Individuals appear to expect that a fixed work routine is detrimental to their well -being at work and that some flexibility of job tasks is more conducive to job satisfaction, but they do not like total control in their own hands either. In a similar vein, workers judge that fast work tempo (high working speed and tight deadlines) will have a negative effect on job satisfaction, but these work circumstances do not have any significant negative effect on *experienced* job satisfaction.

Workers seem to expect that early retirement plans would be beneficial to their job satisfaction even if early retirement is the outcome of the physical demands of the job. Yet, this is not found for the experienced job satisfaction.

As a final test regarding the difference of the two concepts a Kolmogorov-Smirnov (K-S) non-parametric test is applied to test whether the fitted values obtained from the vignette evaluation and the fitted values obtained from the conventional job satisfaction regression come from the same distribution. The K-S test rejected the null hypothesis that the two sets of fitted values come from the same distribution, implying that the two job satisfaction evaluations are distinct.

All in all, the results show that respondents evaluate their current jobs in a completely different way from the way in which they evaluate hypothetical jobs. The utility function derived from vignette analysis does not appear to describe *ex post* or experienced utility as well. Though the vignette analysis is based on an '*as if*' or '*hypothetical*' utility it may come closer to describing the individuals' '*unconstrained*' preferences in the sense of being uncontaminated by the adaptation or/and dissonance reduction processes. In short, the usefulness of the vignette methodology in general and the present findings in particular are relevant for human resource management and knowledge of individual well-being issues.

6. Conclusions

Job satisfaction is a measure of psychological well-being at work. However, it is found that the concept is ambiguous. We have to distinguish between *ex ante* and *ex post* job satisfaction. This study uses a stated preference methodology, which involves evaluation responses by the same individual with respect to various hypothetical jobs, described by vignettes. This approach is relevant in obtaining an insight into the choice process of individuals when they have to decide between various jobs.

The conventional job satisfaction question reveals the evaluation of the worker's own job. This concept of job satisfaction reflects the '*experienced* satisfaction' concept in the sense of Kahneman, Wakker, and Sarin (1997). The job satisfaction question is useful in obtaining insight into how workers evaluate their current job. Both types of concepts appear to carry different types of information. Experienced utility may be used for welfare and well-being analysis. It provides information on the quality of life that a worker or an individual experiences and as such it is very useful for employers, seeking to improve the well-being of their employees taking into account welfare effects when developing human recourse policies. The estimation method presented in this paper has also allowed us to estimate how the individual's current job affects ex-ante job evaluation. Surprisingly, the influence of current job and personal circumstances on the hypothetical job evaluations is rather small.

This study highlights the significance of taking the *ex-ante - ex-post* concepts of satisfaction into account not only for job utility evaluations but also for any type of satisfaction, such as general well-being or happiness. The happiness literature has seen an enormous growth in the last decades. This paper adds to this literature by proposing that well - being or happiness issues can also be studied using the empirical framework of this paper, which distinguishes between *experienced* or *ex post* utility and *ex ante* utility. This distinction seems necessary in order to better understand individual's behavior (e.g. decisions of taking a job) and to make appropriate policy decisions (see also Helliwell, 2006, Layard, 2006, and Van Praag, 2007).

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Table 1: Job attributes used in the vignettes.

Variable	Mean	Min.	Max
Evaluation Vignette	4.120	0	10
Attribute 1: Type of contract			
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	0.157	0	1
(ref.: one-year contract with no probability of continuation)			
Attribute 2: Ln(Working hours) (Working hours ranged from 20 to 50)	31.5	20	50
Attribute 3: Net wage per hour: expressed as a percentage of wages at current job.	-0.020	-0.5	0.5
Attribute 4: Working times			
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
(ref.: employer decides about the working times (not in the night) and may change them monthly			
Attribute 5: Training: (Ordered categorical variable)			
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; and 6= no training.→ The higher the value the variable takes, the less training the employee receive	3.433	1	6
Attribute 6: Work organization			
Job not in teamwork	0.307	0	1
Job in varying teamwork	0.319	0	1
(ref.: job in fixed team)			
Attribute 7: Control over own work			
Job has a fixed routine	0.397	0	1
Can choose order tasks: tasks are fixed, but flexibility on when & how things are done	0.335	0	1
(ref.: no one controls your work)			
Attribute 8: Work speed			
Intensity due to high speed			
Often high speed	0.243	0	1
Sometimes high speed	0.158	0	1
(ref.: never working at high speed)			
Intensity due to tight deadlines			
Often tight deadlines	0.158	0	1
Sometimes tight deadlines	0.169	0	1
(ref.: never working with tight deadlines)			
Attribute 9: Retirement & Labor disability			
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)	0.241	0	1
(ref.: the firm has no early retirement plans)			

Note: The description presented in this Table is not the same as that presented to the respondents. This Table only provides a short description of each attribute.

Figure 1. Typical 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 from 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.

Would this job offer be acceptable to you? *Yes/No*

Note: The respondent is offered an information facility device in which a detailed description of each job attribute is given. This information is very helpful as the respondent can clarify any doubt. This facility keeps structure of the vignette simple. This simplicity facilitates the comparisons between vignettes by the respondents (see Section 3.3).

      In the vignettes presentation the use of colors, bold fonts and broader interline spaces attract the attention of the respondent.

Figure 2. Job Satisfaction

All things considered. how satisfied or dissatisfied are you with your present job using a 0-10 scale? where 0 stands for "completely dissatisfied" and 10 stands for "completely satisfied"

                         0 - Completely dissatisfied
                         1
                         2
                         3
                         4
                         5
                         6
                         7
                         8
                         9
                         10 - Completely satisfied

Table 2: Vignettes evaluation and Job Satisfaction. EPICURUS data. COLS method.

Part I	Vignettes		Job Satisfaction	
	Coef.	*t-value*	*Coef.*	*t-value*
Constant	-8.584	-2.610	-7.946	-1.980
Individual lives in Greece (ref. the Netherlands)	-0.025	-0.570	0.154	2.740
Individual lives in the UK (ref. the Netherlands)	-0.080	-2.620	-0.190	-4.740
Vignette characteristics				
Type of contract				
Permanent contract with no risk of losing the job	0.316	10.330	0.146	3.080
Perm. contr. with risk losing job with compensation	0.171	5.330	0.027	0.520
Perm. contr. with risk losing job with no compensation	0.051	1.560	-0.176	-3.030
Temporary contr. with possibility to permanent contr.	0.209	6.360	-0.067	-0.470
Temporary contr. with possibility to temporary contr.	0.204	7.640	0.057	0.610
(ref. temporary contr. with possibility to unemployment)				
Ln(Working hours)	6.142	9.480	-0.128	-0.500
Ln(working hours)^2	-0.929	-9.960	0.014	0.360
Wages (ving= % of current income ; JS = ln(euros))	1.271	56.750	0.028	1.030
Working times				
Flexible working hours	0.063	2.540	0.225	3.760
Office working hours	0.085	4.000	0.114	2.030
Rotating shifts	-0.108	-5.340	0.095	1.530
(ref. working times decided by employer)				
Training (higher number = less training)	-0.028	-6.150	-0.049	-4.300
Work organization				
Job not in teamwork	0.030	1.690	-0.076	-1.970
Job in varying teamwork	0.042	2.420	-0.077	-2.110
(ref. job in fixed team)				
Control over own work				
Job has a fixed routine	-0.053	-2.790	-0.097	-1.610
Can choose order tasks	0.040	2.010	0.053	0.950
(ref. no one controls your work)				
Intensity due to high speed				
Often high speed	-0.152	-7.690	-0.059	-1.480
Sometimes high speed	-0.046	-2.060	0.000	0.010
(ref. never working at high speed)				
Intensity due to tight deadlines				
Often tight deadlines	-0.104	-4.810	-0.032	-0.850
Sometimes tight deadlines	-0.061	-2.840	-0.021	-0.540
(ref. never working with tight deadlines)				
Retirement				
Have to stop before 65	0.054	1.810	-0.117	-3.260
Early retirement 55	0.210	8.770	0.112	1.630
Early retirement 60	0.198	8.090	0.021	0.560
(ref. firm has no early retirement plans)				

Continuation Table 2, *Part II*	Vignettes		Job Satisfaction	
	Coef.	*t-value*	*Coef.*	*t-value*
Current job characteristics as included in vignettes				
Ln(monthly net wage)	0.007	0.320		
Type of contract				
Permanent contract with no risk of losing the job	-0.096	-0.970		
Perm. contr. with risk losing job with compensation	-0.074	-0.730		
Perm. contr. with risk losing job with no compensation	-0.061	-0.600		
Temporary contr. with possibility to permanent contr.	-0.039	-0.280		
Temporary contr. with possibility to temporary contr.	0.076	0.660		
Other type of contract	-0.072	-0.700		
(ref. temporary contr. with possibility to unemployment)				
Ln(Working hours/week)	-0.260	-1.330		
Ln(Working hours/week)2	0.055	1.770		
Working times				
Always same working times	0.024	0.550		
Rotating shifts	0.093	1.960		
Employee decides	0.037	0.720		
Employee and employer decide together	0.029	0.590		
(ref. working times decided by employer)				
Training (higher number = less training)	-0.001	-0.110		
Work organization				
Job not in teamwork	0.001	0.040		
Job in varying teamwork	-0.021	-0.750		
(ref. job in fixed team)				
Control over own work				
Job has a fixed routine	-0.035	-0.760		
Can choose order tasks	-0.022	-0.520		
(ref. no one controls your work)				
Intensity due to high speed				
Often high speed	-0.032	-1.050		
Sometimes high speed	0.051	1.790		
(ref. never working at high speed)				
Intensity due to tight deadlines				
Often tight deadlines	0.071	2.510		
Sometimes tight deadlines	0.014	0.480		
(ref. never working with tight deadlines)				
Ln(retirement age in firm)	0.121	0.560		
Have to stop before 65	-0.009	-0.310		

Continuation Table 2, *Part III*	Vignettes		Job Satisfaction	
	Coef.	*t-value*	*Coef.*	*t-value*
Other individual characteristics				
Individual has lower education	0.037	1.710	0.081	2.890
Individuals is a male	0.035	1.520	-0.045	-1.480
Ln(individual's age)	-0.122	-2.630	0.148	2.450
Individual is married	0.039	1.390	-0.036	-1.000
Ln(number of earners in the household)	0.094	3.110	-0.016	-0.420
Individual works in the public sector	-0.037	-1.200	0.015	0.370
Ln(number of children under 16 + 1)	-0.014	-0.620	0.023	0.800
Individual has two jobs	0.021	0.530	-0.025	-0.490
Ln(number unemployment weeks last year)	0.002	0.120	0.004	0.230
Year of start current employer	-0.001	-0.670	0.004	2.000
Individual works on Sunday	0.032	0.980	0.044	1.040
Individual works nights	0.005	0.160	-0.003	-0.060
Individual works with flexible times	0.033	1.250	-0.043	-1.240
Individual works on clocking	0.031	1.260	-0.080	-2.470
Individual works on call	0.031	0.930	0.068	1.580
Individual works with computers	-0.035	-1.440	-0.067	-2.140
Individual works with merit system	-0.008	-0.220	-0.019	-0.370
Individual does not work on location	-0.028	-0.710	0.055	1.050
Individual has career perspectives	0.052	1.520	0.124	2.780
Individual is member trade union	-0.091	-3.430	-0.080	-2.290
Individual works with collective agreement	-0.028	-1.090	0.014	0.410
Firm size (increasing in number)	-0.013	-1.470	0.008	0.750
Ln(minutes commuting each way)	0.013	1.070	-0.036	-2.310
Desired retirement age	0.004	2.200	0.011	4.210
Ln(number of times injured at work)	0.014	0.260	-0.034	-0.480
Ln number of times sick due to work)	0.010	0.330	-0.052	-1.390
Ln(desired working hours/week)	0.012	1.990	-0.032	-4.030
Number of Observations	12587		2517	
Number of Groups	2528			
R^2:			0.150	
Within	0.341			
Between	0.137			
Overall	0.274			
Variance individual random effect	0.379			
Variance white noise	0.689			
% of variance due to white noise.	0.232			

Notes: For some variables where there are a number of observations with missing information, a dummy variable for the missing observations is created and inserted with the rest of the explanatory variables.