



Institute for Empirical Research in Economics  
University of Zurich

Working Paper Series  
ISSN 1424-0459

**Forthcoming in: Applied Economics Quarterly 49(2), 2003**

---

Working Paper No. 127

**Do Workers Enjoy Procedural Utility?**

Matthias Benz and Alois Stutzer

September 2002

---

# Do Workers Enjoy Procedural Utility?

Matthias Benz\*

Alois Stutzer

University of Zurich

University of California at Berkeley

July, 2002

**Abstract:** People are likely to obtain utility not only from actual outcomes, but also from the conditions which lead to these outcomes. This paper empirically tests the notion of procedural utility for the context of work relationships. Using a large survey among British workers, we find substantial procedural effects on the utility workers derive from their pay. Utility from pay is not only strongly influenced by economic outcomes (the pay levels workers get for given inputs), but also by the way pay is determined. The findings are robust to a series of alternative explanations. (93 words)

*Keywords:* outcome utility, procedural utility, pay procedure, work relationship, pay satisfaction

*JEL-codes:* D60, D63, J28, J30, M12

---

\* Address: Institute for Empirical Research in Economics, Blümlisalpstr. 10, 8006 Zürich, Switzerland. Phone: +41-1-634 37 32, Fax: +41-1-634 49 07, E-mail: matbenz@iew.unizh.ch, astutzer@iew.unizh.ch. We wish to thank Bruno S. Frey for helpful discussions and the Swiss National Science Foundation for financial support.

# Do Workers Enjoy Procedural Utility?

## 1 Introduction

People are likely to obtain utility not only from actual outcomes, but also from the conditions which lead to these outcomes. This *procedural utility* is quite a different source of an individual's well-being than instrumental outcomes, such as those included in a traditional utility function in economics. While outcomes are important, the notion that people can have preferences about *how* outcomes are generated points to noninstrumental sources of utility and driving forces behind individual behavior. Procedural utility is likely to be important in many areas and in different forms although it is largely ignored in economic concepts of utility. In this paper, we focus on work relationships, and empirically investigate whether workers enjoy procedural utility.

Work relationships are a setting where the existence of procedural utility seems obvious. For example, it is very plausible that workers enjoy some procedural utility from how they are treated by superiors and management, irrespective of the outcomes thereby produced. A dismissal or a promotion decision is likely to be judged differently by workers depending on whether they see the process leading to the decision as acceptable or not. Proponents of 'industrial democracy' in economics or of the 'human relations movement' in management have long been arguing that how workers are treated, e.g. whether they are given a say in decisions concerning the workplace, has some value in itself. It is thus not only the instrumental aspects of work that matter (e.g., the pay workers get for a given work input), but also how these outcomes at work are determined. Although this view has received considerable attention, the underlying assumption that workers gain procedural utility has hardly been studied empirically.

In order to identify procedural utility, we focus on a specific, but important, aspect of work life: the utility workers derive from their pay. Utility from pay is well suited to distinguish outcome and process utility, because it is relatively straightforward to define and measure outcome utility in this context. On an individual basis, outcome utility is derived from the pay level a worker gets for a given work input (job carried out, hours worked, overtime, education, tenure, etc.): the higher the pay levels *ceteris paribus*, the higher outcome utility. The relevant variables are regularly collected in labour force surveys and thus allow assessing

outcome utility. To identify procedural utility, we test whether workers enjoy utility stemming from the *processes by which pay is determined* over and above outcome utility. We find substantial evidence that workers experience procedural utility from being regularly given the opportunity to express their views on pay issues towards superiors and management.

A crucial question in this context is how utility from pay can be assessed empirically. From a traditional economic view, utility cannot be measured directly, but has to be inferred from observed behaviour. Here, we take a different approach. We measure utility from pay directly by using self reported pay satisfaction measures as a proxy. Although this is not (yet) standard in economics, satisfaction measures are increasingly accepted as useful proxy measures for utility (e.g., for accounts of the discussions on life satisfaction as a proxy for individual well-being, see Frey and Stutzer 2002c and Oswald 1997). As reported satisfaction measures are based on individuals' self-assessments, they can be biased in several ways. We therefore conduct an extensive sensitivity analysis to take account of such biases and to rule out alternative explanations.

The traditional way to identify procedural utility would be to consider it as a compensating wage differential. If workers value processes, they should be prepared to accept a lower wage, *ceteris paribus*. However, it is not straightforward to apply the framework of compensating wage differentials to the study of procedural utility. Even if procedures have the expected direct effects on utility, this is not necessarily reflected in a corresponding wage differential: procedures can also exert indirect and countervailing effects on workers' productivity (e.g. via changes in work motivation). Studying wage differentials, it is difficult to separate the various positive and negative effects of procedural differences that are reflected in a net effect on income. Thus, it seems warranted to take a more direct approach to identify procedural utility by using pay satisfaction as a proxy for the utility workers derive from their compensation.

The paper is organised as follows. Section 2.1 takes a broad look at procedural utility and proposes that three varieties of procedural utility relevant for economics can be distinguished. Section 2.2 introduces measures of reported satisfaction as proxies for utility. Section 2.3 and 2.4 briefly discuss previous work related to procedural utility in work relationships, set out in what respect our study differs from previous investigations and put forward two hypotheses. Section 3 presents the data and the operationalisation of the hypotheses. Section 4 contains the empirical analysis. Section 5 offers conclusions.

## 2 Procedural Utility in Work Relationships

### 2.1 The idea of procedural utility in economics

Standard economic theory is based on the simplifying assumption that individuals derive utility from instrumental outcomes only. In contrast, procedural utility means that people also value the conditions, which lead to these outcomes. People can have preferences about a multitude of different conditions or procedures. They may range from basic constitutional institutions, like the right to participate in democratic decision making, to the structures of bilateral exchange relationships, or the context in which individual behaviour takes place. We propose to classify the sources of procedural utility into three broad categories which are relevant in economic contexts.

- (i) There is procedural utility people get from institutions as such. People have preferences about *how* allocative and redistributive decisions are taken. They may, for example, appreciate the market place for the freedom it provides in individual choice and democracy for the equality it provides in political decision-making. In an empirical application, Frey and Stutzer (2002a) study procedural utility that emerges when individuals are granted the possibility to participate in decision making. They empirically show that people gain procedural utility from having extended political participation rights. Procedural utility, in this case, is mediated through institutions of direct democracy like initiatives and referenda. The utility effects of these institutions thereby seem not to come so much from people's opportunity to impose outcomes closer to their preferences; much more, individuals seem to value the possibility to participate *per se*. Thus, people get utility from living and acting under particular institutions over and above outcomes.
- (ii) Procedural utility is involved in the interaction between people. On the one hand, people can get satisfaction from acting in a fair way or by being honest with other people, quite independent of the outcome.<sup>1</sup> On the other hand, people evaluate actions towards them

---

<sup>1</sup> In the last few years experimental economics has unambiguously shown that people derive utility from behaving fairly. Individuals often choose to follow social norms like fairness or reciprocity, although this leads to inferior economic outcomes for them (see e.g. Fehr and Gächter 2000 for an overview of the experimental literature).

not only by their consequences but also by the intentions behind these actions.<sup>2</sup> An individual is, for example, emotionally affected in a negative way by an action when he or she attributes the actor with a criminal motive rather than a neutral motive.<sup>3</sup> How people perceive a particular treatment, for example by a member of the public administration or by their superiors at work, is, of course, often also depending on the institutional setting.

- (iii) Procedural utility can be observed when people undertake an activity for its own sake, i.e. when they have an intrinsic attitude towards the action or choice process they are involved in. Some people, for example, just like the activity of gardening, although the output they thereby produce is *instrumentally inferior* (they could get the same products cheaper and possibly of higher quality on the market). A theoretical literature reflects economists' interest in this kind of procedural utility. In particular, it has been useful to model a specific utility for gambling (see Le Menestrel 2001). Pascal (1670) was well aware of the fact that people derive utility from the mere act of engaging in an activity such as gambling, and so were Marschak (1950) and von Neumann and Morgenstern (1953).<sup>4</sup> The intrinsic value of tasks may again not be independent of the institutional environment. If, for instance, the institutional context guarantees autonomy, people may enjoy a task more.

Procedures as a source of individual utility cannot easily be integrated into traditional economic theory, even if they are themselves reflected in behaviour. This is because the traditional framework excludes non-instrumental concerns when analysing people's choices.<sup>5</sup> The idea of procedural utility thus goes beyond the narrow consequentialism of standard economics. This makes it vulnerable to the accusation of being tautological: ex post, every situation can be redefined to involve 'procedural goods' in order to explain puzzling

---

<sup>2</sup> Economic models of behaviour that include the underlying motivation of people are for example Falk and Fischbacher (2000) and Rabin (1993). In a series of experiments, Falk, Fehr and Fischbacher (2000) find that individuals value how they are treated by other persons. People seem to experience lower utility when they are treated intentionally badly, even if economic outcomes are the same.

<sup>3</sup> Rabin (2002) emphasises the need for an extended utility concept if these aspects of individual interaction beyond narrow outcome oriented self-interest are to be integrated in welfare analysis: "[...] players in games behave systematically differently as a function of previous behaviour by other players. This shows that people care not only about outcomes, but also how they arrived at those outcomes. The fact that preferences cannot be defined solely on outcomes can be reconciled with preference theory, but requires an expansion of the notion of what enters the utility function" (p. 15).

<sup>4</sup> There are two strands of literature in empirical economic research that deal with an object very much related to procedural utility of this third type: the first is compensation differentials in wage rates reflecting the nonmonetary benefits of work (e.g. Rosen 1986, Viscusi 1993), and the second is process benefits in studies on the use of time (e.g. Juster and Stafford 1985).

behaviour. However, this objection also applies to traditional economics to the extent that every observed change in behaviour is assumed to reflect changes in relative (opportunity) costs or prices (Becker 1976). In order to be a fruitful concept that makes testable predictions, it is necessary (i) to specify conditions under which procedural utility is expected to be higher (or lower) than otherwise and (ii) to have a proxy measure for utility.

## 2.2 Measuring utility

With respect to measuring utility, economics has experienced a change in recent years. Utility is increasingly seen as *directly measurable* by using self-reported satisfaction measures as a proxy. Measures of subjective well-being (or happiness) have been successfully applied in economic research e.g. by Clark and Oswald (1994), Di Tella et al. (2001), Easterlin (2001), Frey and Stutzer (2000) and Kahneman et al. (1997) (for surveys see Frey and Stutzer 2002b,c and Oswald 1997).<sup>6</sup> The existing state of research suggests that measures of reported satisfaction are a satisfactory empirical approximation to individual utility (Frey and Stutzer 2002c). It is thus possible to study procedural effects on individual well-being directly, which makes the notion of procedural utility empirically tractable. Here, we propose that self-reported pay satisfaction can serve as an indicator for the utility people derive from their pay.

## 2.3 Related research for work organisations

With respect to theoretical underpinnings, the study of procedural utility can be informed by several strands of literature.

The concept of procedural utility is related to research on *fairness* in economics and in other social sciences. In field, experiment and survey studies, it has been shown that pro-social preferences influence market behaviour (for the labour market, see e.g. Bewley 1999, Fehr and Schmidt 2002 and Kahneman, Knetsch and Thaler 1986). People are for instance willing to bear the costs of taking revenge if they perceive themselves to be treated in an unfair manner. Thereby, perceived fairness can depend strongly on the applied procedures for decision-making. However, in most of the previous research, concerns for procedural fairness or justice have been seen as almost exclusively instrumental, i.e. people have preferences for fair procedures because they expect desirable outcomes (Thibaut and Walker 1975).

---

<sup>5</sup> This is actually done for good reasons; otherwise, the standard expected utility model could not be applied (Harsanyi 1993).

<sup>6</sup> In labor economics, satisfaction measures were first used by Hamermesh (1977) in a paper on economic determinants of job satisfaction.

Theories of procedural fairness, in which an *intrinsic value is attributed to the process itself*, have mostly been advanced by psychologists (see e.g. Lind and Tyler 1988). Several theories in psychology can provide a psychological underpinning of procedural utility in the work setting and in general. In the *group-value or relational model* of Lind and Tyler (1988), procedural utility emerges because fair procedures build group solidarity and strengthen the members' good standing in a group. Accordingly, people join groups not only for instrumental reasons (attracting economic advantages) but also in order to obtain psychological rewards associated with group affiliation, which are mainly determined by procedural factors. In an extension of the model, the value of procedural justice for workers is tied to intellectual and emotional recognition by superiors (Kim and Mauborgne 1998). In *self-determination theory* the latter ideas are captured in the notions of relatedness and competence. The theory says that participation and autonomy in decision-making provide procedural goods that serve innate needs of competence, autonomy and relatedness and thus contribute to individual well-being, irrespective of instrumental outcomes (Deci and Ryan 2000).

In sum, psychological theories suggest that procedures are evaluated by the relational information that they convey, such as assessments of impartiality, trustworthiness of superiors and authorities, the extent to which individuals feel they are treated with dignity, and the extent to which individuals are given voice (e.g. Lane 1988, Tyler et al. 1997, Tyler and Blader 2000). This allows to derive hypotheses under which conditions procedural utility is expected to be higher (lower). Previous research on work organisations has thereby not so much focused on objective differences between procedures, but has mainly relied on subjective fairness evaluations of the procedures applied e.g. at a workplace. Justice perceptions in the work realm have so far been linked to work performance, organisational citizenship behaviour, counterproductive work behaviour, withdrawal behaviour and organisational commitment (see recent contributions in Greenberg and Cropanzano 2001 and Cohen-Charash and Spector 2001 for a meta-analysis). Procedural utility can be seen as the attitudinal counterpart to these behavioural responses that is reflected – loosely speaking – in workers 'satisfaction'.

#### **2.4 An application: procedural utility from pay procedures**

In this study, we try to identify procedural utility directly by studying the effects of pay procedures on utility from pay. Pay is a well suited subject of study, because it constitutes an



important outcome for workers with respect to their job. In a purely instrumental view, pay is the only outcome of interest, because every aspect of a job or work relation is evaluated with respect to the pay it generates for an employee. Moreover, the pay level a worker gets for a given work input is commonly understood as the source of outcome utility in this context. It is essential that outcome utility is properly controlled for when assessing procedural effects. It has to be ruled out that procedures are only valued by workers because they generate better outcomes for them.

Pay procedures determine how firms set, adjust, administer and communicate individual employees' compensation for their engagement in the job. They reflect an important aspect of a firm's 'constitution' and employees may gain procedural utility from these institutions that form the pay process as such. Moreover, pay procedures form the interaction between superiors and subordinates in questions of compensation. They may have a substantial effect on how employees feel that they are treated. A major characteristic of procedures that are perceived as fair is the admission of voice to both sides (see section 2.3). Differences in voice convey important relational information, which is expected to result in differences in procedural utility. Thus, we advance Hypothesis I:

*The more frequently employees have the possibility of voice in the pay process the more procedural utility they gain over and above the outcome utility from their compensation.*

In hypothesis I, the determinants of outcome and process utility are assumed to be independent. However, evidence suggests that process judgements interact with the perceived favourability of outcomes (Brockner and Wiesenfeld 1996). In particular, when an outcome is not personally beneficial, individuals tend to experience low outcome satisfaction, unless the procedure is perceived as fair. Thus, procedural utility is expected to be higher for relatively bad outcomes, *ceteris paribus*. In the present setting, the prediction is not so straightforward. The perceived fairness of pay procedures is not directly connected with the procedures that determine employees' output and that are themselves the basis for their pay. Nevertheless, following the basic idea of interaction, we formulate hypothesis II:

*The less favourable the outcome of the pay process, the more the possibility of voice in the pay process is contributing to procedural utility.*

In order to test these hypotheses empirically, we use satisfaction with pay as a domain specific proxy measure for utility. Pay satisfaction is a very well established measure for

employees' evaluation of their compensation (e.g. Heneman and Schawb 1985, Mulvey et al. 1992). There is also substantial previous research that has studied the effects of participation on pay satisfaction (starting with Lawler 1976). However, the observed relationships between work place institutions and pay satisfaction have hardly been analysed on systematic differences between instrumental and non-instrumental aspects. The studies most closely related to ours (Martin and Bennett 1996, Tremblay et al. 2000) have studied how reported perceived fairness of pay procedures correlates with pay satisfaction. In contrast to this work, the present study does not refer to proxy measures of perceived fairness. Instead, institutional variation in pay procedures as such is analysed empirically. Compared to most of the previous research on pay satisfaction or on procedural justice, we can rely on a large and representative data set. Moreover, the survey design allows for the rigorous controlling of confounding outcome effects and testing of various alternative explanations.

### **3 Data**

The empirical analysis is based on the 1998 Workplace Employee Relations Survey (WERS, Department of Trade and Industry 1999), which can be considered to be the most authoritative source of information on employee relations in Great Britain. In the WERS, a nationally representative sample of over 28,000 British employees working in 2,200 different firms participated in an anonymous self-completion survey about their workplace.<sup>7</sup> Apart from being a large scale, representative survey, the WERS is especially suited for the empirical analysis because it contains some unique questions that allow identifying process and outcome utility at the individual level.

As the dependent variable, we use pay satisfaction as a proxy for the utility workers derive from their compensation. Whereas other large worker surveys only assess general work satisfaction (if at all), the WERS assesses satisfaction separately in different dimensions. With respect to compensation, workers had to answer the following question: "How satisfied are you with the following aspects of your job? [...] The amount of pay you receive." Answers were coded on a five point scale ranging from "1=very satisfied", "2=satisfied", "3=neither satisfied nor dissatisfied", "4=dissatisfied" to "5=very dissatisfied". We recode answers so that the highest satisfaction score of 5 means "very satisfied" and the lowest score of 1 means

---

<sup>7</sup> As there is a considerable number of missing values, we are left with a final data set of 22,622 employees working in 1,774 different firms for which all required information is available.

“very dissatisfied”.<sup>8</sup> A look at descriptive statistics shows that British workers are only moderately satisfied with their pay on average. The people included in our final sample indicate a mean pay satisfaction value of 2.83, which is just below the category “neither satisfied nor dissatisfied”. There is substantial variation in pay satisfaction (st.d. = 1.10), indicating that British workers differ considerably in the utility they derive from their pay.

The main aspect of our empirical investigation is to disentangle outcome and process effects on pay satisfaction. Thereby, a worker’s wage – while controlling for a wide range of work inputs - is applied as determinant of outcome utility. The higher a worker’s wage is for the same work input, the higher is outcome utility expected to be. In the WERS, workers’ pay levels are assessed using twelve wage categories.<sup>9</sup> As these categories are relatively broad, we apply two different approaches to identify outcome utility. First, we compute an hourly wage rate for each worker by taking the mean wage of the wage category a worker is in and dividing it by the regular and overtime hours a worker regularly works.<sup>10</sup> This results in a much more refined picture of individual wages: the resulting hourly wage rate variable contains not just 13, but 1320 different categories. As a second strategy, the twelve wage categories in the WERS are included directly as dummy variables (while correcting for hours and overtime hours worked). A categorised variable can indicate, for example, nonlinearities in the relationship between wage and outcome utility that the first variable cannot account for. Both earnings variables will only adequately reflect outcome utility, however, if work inputs are held constant. The WERS contains information on the following work characteristics: tenure (5 categories), type of contract (3 categories), age (7 categories), highest educational qualification (6 categories), job carried out (9 categories), industry (12 categories), establishment size (5 categories), marital status (4 categories), race (9 categories), gender and

---

<sup>8</sup> The other areas where satisfaction was assessed included “the amount of influence you have over your job”, “the sense of achievement you get from your work” and “the respect you get from supervisors”. These dimensions were coded equally and are used later in the sensitivity analysis section.

<sup>9</sup> The exact question is “How much do you get paid for your job here, before tax and other deductions are taken out?” The categories are “less than £2,600 per year”, “£2,601-£4,160 per year”, “£4,161-£7,280 per year”, “£7,281-£9,630 per year”, “£9,631-£11,440 per year”, “£11,441-£13,520 per year”, “£13,521-£16,120 per year”, “£16,121-£18,720 per year”, “£18,721-£22,360 per year”, “£22,361-£28,080 per year”, “£28,081-£35,360 per year”, “£35,361 or more per year”.

<sup>10</sup> Specifically, we divided average weekly earnings by the average hours worked each week. Thereby, average overtime hours worked reported by the workers were weighted by a factor 1.5, but only if workers indicated that they were paid extra for the overtime hours (in Britain, paid overtime hours have to be compensated by a factor of 1.5 of normal hourly wages). If workers indicated that they were sometimes compensated for overtime hours and sometimes could take off later, we weighted overtime hours by a factor 1.25. For the top wage category a mean wage of £765/week (£39,780/year) is assumed. The resulting variable has a mean of £7.64 (st.d. £6.42), and its natural logarithm a mean of 1.89 (st.d. 0.50).

the existence of a union at the establishment. These variables are included as control variables to correct outcome utility estimates for differences in work inputs between workers.

In order to identify *procedural utility*, the WERS offers a unique variable that captures specifically how pay is handled at a workplace. Workers were asked: “How often are you and others working here asked by managers about your views on the following: [...] Pay issues?”<sup>11</sup> Answers were coded on a four point scale including “frequently”, “sometimes”, “hardly ever” and “never”. Again, we recode answers so that the procedural variable takes on the highest value (equal to 4) when workers are asked frequently about their views on pay issues, and the lowest (equal to 1) when this is never the case. The resulting variable is well suited to study procedural utility, because it captures two conditions, which we have connected to procedural utility. On the one hand, the variable contains the notion of participation possibilities. The more workers are given the possibility to express their views on pay issues, the higher is their potential say in decisions concerning this important aspect of work. On the other hand, the frequency of being asked on pay issues gives an indication of how workers are treated by their superiors and management with respect to pay determination. So workers may gain procedural utility from the institution as such as well as from the quality of interaction. The descriptive statistics show that on average, British workers are not given much opportunities for voice. The mean value in the sample is 1.84, indicating that workers are on average “hardly ever” consulted on pay issues. However, there is substantial variation (st.d. 0.95) that can be exploited in the empirical analysis.

In our view, the data and variables used have several advantages compared to related research on work relationships. First, the WERS is to our knowledge the only large scale, representative employee survey that asks workers in such a precise and specific way to give information on the procedures surrounding pay determination. This is important, because most previous research has been done with nonrepresentative and rather small samples of employees working in a small number of firms (for a survey see Tyler and Blader 2000). While this research has greatly advanced the understanding of the *detailed* psychological mechanisms that lead to procedural fairness perceptions, it is important whether procedural utility is a *representative* phenomenon relevant for a broad class of workers, irrespective of job, industry, or the size of the firm they work in. Second, the process variable is captured ‘plain’, i.e. without an assessment of perceived fairness. This reduces biases due to reverse

causation.<sup>12</sup> Third, the survey design allows for the rigorous controlling of outcome utility because, along with wage rates, it also contains essential work input variables.

## 4 Empirical Analysis

### 4.1 Basic regression for procedural utility

In table 1, we present the results for the ‘basic’ regression that includes all the main explanatory and control variables presented in the last section. As pay satisfaction is ordinally scaled, a weighted ordered probit model is used in order to exploit the ranking information contained in the dependent variable. The weighting variable that is applied allows representative results on the subject level for Britain. Moreover, the estimated standard errors are adjusted to clustering of observations at the firm level. This is necessary because firms have been the primary sampling units and thus observations may not be independent within firms. The workers in our data set work in 1,774 different firms.

The results in table 1 indicate that there are significant outcome and procedural effects on the utility workers derive from their pay. The results can be interpreted as follows: A positive coefficient indicates that the probability of being more satisfied with pay increases, compared to any given level. The marginal effect indicates the change of the probability that an individual is more satisfied with pay by one point when the independent variable increases by one unit. Alternatively, it can be interpreted as an increase in the share of persons that derive a certain level of utility from pay. In the case of dummy variables, the marginal effect is evaluated with respect to the reference group. The marginal effects provided indicate the average probability change over all the five scores of the pay satisfaction variable.

---

<sup>11</sup> There were four other areas for which workers had to state how often they were asked by management for their views: “Future plans for the workplace“, “Staffing issues“, “Changes to work practices“, “Health and safety at work“. These variables are used in the sensitivity analysis section.

<sup>12</sup> The possibility of reverse causation is discussed and empirically tested in section 4.3.

Table 1: Procedural Utility from Pay Procedures

Dependent variable: pay satisfaction

Variable	Weighted ordered probit Std. err. adjusted to clustering at the firm level		
	Coefficient	z-value	Marginal effect (average for all scores)
<i>(1) Procedural factor</i>			
Frequency of being asked on pay issues	0.202**	17.170	0.031
<i>(2) Outcome factor</i>			
Log(hourly wage)	0.712**	16.049	0.108
<i>(3) Variables controlling for work inputs</i>			
Tenure			
less than 1 year		Reference group	
1 to less than 2 years	-0.121**	-3.719	-0.018
2 to less than 5 years	-0.149**	-4.264	-0.023
5 to less than 10 years	-0.196**	-5.661	-0.030
more than 10 years	-0.308**	-8.734	-0.048
Age			
less than 20		Reference group	
20-24	-0.263**	-3.903	-0.041
25-29	-0.340**	-5.153	-0.053
30-39	-0.299**	-4.640	-0.046
40-49	-0.240**	-3.627	-0.037
50-59	-0.249**	-3.612	-0.039
60 or more	0.098	1.211	0.015
Type of contract			
permanent		Reference group	
temporary	0.147**	2.631	0.022
fixed-term	0.028	0.519	0.004
Education			
CSE or equivalent		Reference group	
O level or equivalent	-0.081*	-2.121	0.012
A level or equivalent	-0.159**	-4.287	0.024
Degree or equivalent	-0.264**	-5.608	0.041
Postgraduate degree or equivalent	-0.278**	-4.893	0.043
No of the education levels mentioned	0.005	0.145	0.001
Job carried out			
Manager & senior administrator		Reference group	
Professional	-0.236**	-5.495	0.037
Associate professional & technical	-0.279**	-5.757	0.043
Clerical & secretarial	-0.177**	-3.942	0.027
Craft & skilled service	-0.352**	-6.576	0.055
Personal & protective service	-0.092	-1.554	0.014
Sales	0.073	1.182	0.011
Operative & assembly	-0.148*	-2.174	0.023
Other occupation	0.018	0.293	0.002
No union at workplace			
Union at workplace	-0.010	0.387	-0.001
Industry			

Manufacturing		Reference group	
Electricity, gas and water	0.244**	3.870	0.037
Construction	-0.019	-0.339	-0.002
Wholesale and retail	0.006	0.135	0.001
Hotels and restaurants	-0.039	-0.526	-0.006
Transport and communication	-0.204**	-3.586	-0.032
Financial services	-0.045	-0.727	-0.007
Other business services	-0.132*	-2.446	-0.020
Public administration	-0.144*	-2.406	-0.022
Education	-0.115*	-2.181	-0.018
Health	-0.220**	-3.463	-0.034
Other community services	-0.202**	-3.225	-0.031
Establishment size			
Less than 25 employees		Reference group	
25-49 employees	-0.044	-1.610	0.006
50-99 employees	-0.034	-1.225	-0.005
100-199 employees	-0.028	-1.003	0.004
200-499 employees	-0.080**	-2.968	-0.012
500 or more employees	0.003	0.123	-0.001
<i>(4) Socio-demographic variables</i>			
Male		Reference group	
Female	0.332**	5.443	0.051
Marital Status			
Single		Reference group	
Living with spouse or partner	0.015	0.527	0.002
Divorced/separated	-0.043	-0.872	-0.006
Widowed	0.063	0.668	0.009
Race			
White		Reference group	
Black Caribbean	-0.384*	-2.440	-0.060
Black African	-0.258	-1.651	-0.040
Black other	-0.457*	-2.442	-0.072
Indian	-0.154	-1.383	-0.024
Pakistani	0.128	0.880	0.019
Bangladeshi	-0.277	-1.324	-0.043
Chinese	-0.219	-0.931	-0.034
Other ethnic group	-0.120	-1.407	-0.018
Observations	22,622		
Number of firms (sampling units)	1,774		
F (56, 1718)	25.43**		
Log likelihood	-30931.497		
Pseudo R <sup>2</sup>	0.05		

*Notes:* Pay satisfaction is measured on a five point scale. White estimator for variance. Significance levels: (\*) 0.05 < p < 0.10, \* 0.01 < p < 0.05, \*\* p < 0.01.  
*Data source:* WERS 1998.

As a main result, we find that workers report higher satisfaction with pay when they are asked on pay issues by their superiors, *ceteris paribus*. A one point increase in the procedural factor ‘frequency of being asked on pay issues’ raises the probability of a person being one point

more satisfied with pay by 3.1 percentage points. The effect is sizeable and statistically highly significant. When the full range of the procedural variable is considered, i.e. when individuals who are never asked on pay issues are compared to workers who are frequently asked, the marginal effect amounts to 9.3 percentage points. This means, for example, that workers who are regularly given the opportunity to express their views on pay issues towards superiors and management are about 9 percent more likely to be very satisfied with pay than workers who never have this opportunity. This evidence lends support to hypothesis I that workers gain procedural utility from having the possibility of voice in pay issues.

The procedural effect exists over and above an outcome effect. The outcome factor is itself an statistically highly significant predictor of pay satisfaction. A shift in the log hourly wage by one standard deviation (0.5 points) changes a worker's pay satisfaction by 5.4 percentage points; in other words, a one st.d. higher pay level (approx. an increase of £4 from £6.5 to £10.5) leads *ceteris paribus* to a 5.4 percent higher outcome utility.<sup>13</sup> This evidence supports the traditional economic view that outcomes provide utility. However, the size of the effect is relatively small.

The estimation results furthermore indicate that it is important to include control variables when assessing procedural and outcome utility in work relationships. Most of the work input and socio-demographic variables exert statistically significant effects on pay satisfaction, and the estimated signs can be plausibly interpreted. For example, it seems natural that workers with higher tenure are less satisfied with their pay given that they get the same pay as otherwise similar colleagues with lower tenure. Along the same lines, the negative effects estimated for higher age and higher education, and the positive effects for temporary workers can be explained. Satisfaction with pay is estimated to be u-shaped in age, indicating that workers are least satisfied with their pay *ceteris paribus* at ages 25-39. satisfaction is more or less linearly decreasing in education if wage levels and other work inputs are held constant. An interpretation of this may be that income aspirations are increasing in education and that the negative effects reflect the discrepancy between actual pay and aspiration level. Temporary workers are found to be more satisfied with their pay *ceteris paribus* than workers with permanent contracts. Whereas these previous results are plausible, it seems difficult to explain why some profession groups are less satisfied with their pay *ceteris paribus* than the higher ranking reference group of managers, and why workers belonging to some non-white

---

<sup>13</sup> The effects are computed using coefficients from a regression identical to the basic regression in table 1, but instead of ordered probit estimator the OLS method was applied (OLS regression not shown).



racers are less satisfied than white workers *ceteris paribus* (i.e. getting the same pay level). Especially in the latter case, there might be idiosyncratic reasons at work why workers are less satisfied with their pay, e.g. cultural differences.

#### **4.2 Absolute pay, relative pay, and the interaction between procedural utility and outcome favourability**

In the basic regression, outcome utility is measured using the variable ‘hourly wage’ while controlling for work inputs. One might argue that this variable does not correctly measure outcome utility, because individuals might only care for the *absolute* level of their pay and disregard work inputs. Indeed, the outcome variable applied can be interpreted as a measure of *relative income*: as the regression controls for input characteristics, an employee’s wage level is already indicating her income position relative to similar workers. In order to investigate whether such differences in the definition of outcome utility affect the results, we first estimate a regression that only includes the absolute hourly wage level and the procedural variable, while disregarding all other work input variables that are included in the basic regression. The results are presented in panel A in table 2. They show that the coefficient of the procedural variable is basically unchanged, while also an outcome utility effect from absolute wage levels is found. Second, a wage function is estimated that includes all the factors included in table 1 (except the procedural variable). From the wage function, we calculate for each worker her positive or negative wage premium relative to equally characterised workers. Panel B of table 2 shows the estimation results when individual wage differentials are included in the regression, together with the absolute wage level and the procedural factor. The results indicate that relative wages exert a positive effect on workers pay satisfaction, and that the absolute wage levels become relatively unimportant. This corroborates previous findings that relative income matters for satisfaction on the job (Clark and Oswald 1996). Moreover, the procedural effect is only minimally affected by this change in specification.

In hypothesis II, it is argued that workers’ experience of procedural utility cannot be considered independent of the outcome of the process: The characteristics of the process matter more in case of an unfavourable outcome. This proposition can be empirically tested with an interaction term that combines the procedural factor with the outcome variable ([frequency of being asked on pay issues]\*[relative wage level]). The results are presented in panel C in table 2. We find that the procedural factor is not significantly more important when

relative outcomes are unfavourable. There seems to be no sizeable systematic difference in the procedural utility employees can gain from having a say in pay issues, depending on the favourability of the outcome. Thus the empirical evidence does not support hypothesis II. An explanation could be that processes and outcomes interact in a more complex way than assumed in hypothesis II. For example, while a procedure that is perceived as fair may be more valuable as such when the outcome is not beneficial for oneself, it may also reduce self-esteem more because an unfavourable outcome is more attributed to oneself (Schroth and Shah 2000).

Table 2: Absolute Pay, Relative Pay, and the Interaction between Procedural Utility and Outcome Favourability

Dependent variable: pay satisfaction

Variable	Weighted ordered probit		
	Std. err. adjusted to clustering at the firm level		
	A	B	C
<i>Procedural factor</i>			
Frequency of being asked on pay issues	0.205** (0.011)	0.211** (0.013)	0.221** (0.013)
<i>Outcome factors</i>			
Absolute Pay Level (Log(hourly wage))	0.403** (0.028)	0.122** (0.034)	0.119** (0.034)
Relative Pay Level (Residuals from a wage regression)		0.566** (0.052)	0.534** (0.110)
<i>Interaction between process and outcome</i>			
Procedural factor * Relative Pay Level			0.018 (0.042)
No. of observations	22,622	22,622	22,622
Log likelihood	-31753.525	-31514.529	-31514.116

Notes: Standard errors are in parentheses. Significance levels: \* 0.01 < p < 0.05, \*\* p < 0.01.

Data source: WERS 1998.

### 4.3 Sensitivity Analysis

The large and representative survey at hand offers a promising possibility to study outcome and process utility. It provides measures for workers involvement in pay issues, their wage and their satisfaction with pay. Still, the variables are based on *self-reported* measures. Thus, it is possible that workers give systematically biased answers, or that the variables measure something else than they are actually intended to measure. In this subsection, such potential

errors in measurement are explored in some detail. The results of the sensitivity analysis are summarised in table 3. It is reported how the coefficient on the procedural factor is changed when alternative specifications are estimated. Panel A in table 3 restates the results for the basic equation in table 1.

First, the procedural variable ‘frequency of being asked on pay issues’ might not precisely measure procedures surrounding pay determination if workers have the *general relationships between managers and workers* in mind when answering the question. If the atmosphere at work is good, workers can be expected to be more satisfied with a given pay level, but they might also be inclined to overstate the frequency of being asked on pay issues just because general work relations are good. Then, the estimated effect for the procedural factor would not necessarily reflect procedural utility with respect to pay, but could just reflect better outcomes in other work areas associated with good work relationships. To address this problem, a specification is estimated that includes a variable for the general quality of work relationships (and otherwise the same variables as in the basic regression). Workers were asked: “In general, how would you describe the relations between managers and employees here?” Answers were given on a five point scale ranging from ‘very good’ (5) to ‘very poor’ (1). The results for the extended specification B in table 3 indicate that indeed part of the process effect in the estimation is due to such an omitted factor of general work quality. Once good general relationships between workers and managers are accounted for, the coefficient on the procedural variable is lowered by about on third of the basic estimate. Nevertheless, it remains considerable in size and statistically highly significant. General work relationships are in itself an important predictor of pay satisfaction.

Table 3: Sensitivity Analysis

Dependent variable: pay satisfaction

Variable	Weighted ordered probit				
	Std. err. adjusted to clustering at the firm level				
	A	B	C	D	E
<i>Procedural factor</i>					
Frequency of being asked on pay issues	0.202** (0.011)	0.140** (0.012)	0.109** (0.014)	0.106** (0.015)	0.107** (0.014)
<i>Outcome factor</i>					
Log(hourly wage)	0.712** (0.044)	0.714** (0.042)	0.716** (0.042)	0.742** (0.045)	
<i>Quality of relations between managers and employees</i>		0.314** (0.010)	0.296** (0.010)	0.134** (0.013)	0.133** (0.013)
<i>Involvement in other work areas</i>					
Future plans for workplace			0.007 (0.012)	-0.021 (0.013)	-0.022 (0.013)
Staffing issues			0.003 (0.014)	0.007 (0.012)	0.007 (0.013)
Changes to work practices			0.032* (0.014)	0.009 (0.014)	0.010 (0.015)
Health and safety at work			0.035** (0.011)	0.015 (0.012)	0.016 (0.012)
<i>Satisfaction with other aspects of job</i>					
Amount of influence over job				0.175** (0.014)	0.174** (0.014)
Sense of achievement				0.129** (0.012)	0.133** (0.012)
Respect from supervisors				0.136** (0.013)	0.134** (0.013)
<i>Wage categories</i>					
less than £2,600 per year					Ref. group
£2,601-£4,160 per year					0.010
£4,161-£7,280 per year					0.265**
£7,281-£9,630 per year					0.290**
£9,631-£11,440 per year					0.384**
£11,441-£13,520 per year					0.599**
£13,521-£16,120 per year					0.793**
£16,121-£18,720 per year					1.004**
£18,721-£22,360 per year					1.287**
£22,361-£28,080 per year					1.418**
£28,081-£35,360 per year					1.699**
£35,361 or more per year					2.096**
<i>Regular weekly hours worked</i>					-0.023**
<i>Unpaid weekly overtime hours worked</i>					-0.029**
<i>Paid weekly overtime hours worked</i>					-0.018**
<i>Control variables for work inputs and socio-demographic characteristics</i>					
	————— Yes —————				
No. of observations	22,622	22,622	22,353	21,925	21,925
Log likelihood	-30931.497	-30014.825	-29605.863	-28222.799	-26972.154

Notes: Standard errors are in parentheses. Regressions are weighted ordered probit. They include the same control variables as in table 1. Significance levels: \* 0.01 < p < 0.05, \*\* p < 0.01. Data source: WERS 1998.

Second, the procedural variable might not measure workers involvement regarding pay issues, but could just reflect workers involvement in other issues concerning their workplace. As the interest is in the procedures with respect to pay, this would be a serious mismeasurement. The survey design allows controlling for this alternative explanation because in the WERS, workers were asked about their involvement in four important additional work dimensions. Apart from ‘pay issues’, workers had to answer the question “How often are you and others working here asked by managers about your views on the following: [...] future plans for the workplace, staffing issues, changes to work practices and health and safety at work?”<sup>14</sup> These four variables are included in specification C. The results show that the estimate for procedural utility is thereby changed in the expected direction. The coefficient is lowered by an additional fifth, being the involvement in the areas ‘change to work practices’ and ‘health and safety’ those who capture part of the basic procedural utility estimate. Note, however, that the procedural effect remains statistically highly significant and sizeable. This is remarkable, because in specification C the procedural variable is very likely to capture nothing else than the specific effects of being asked on pay issues. This alone seems to have a considerable effect on pay satisfaction, regardless of any other involvement at the workplace or general quality of work relationships.

Third, even controlling for the aforementioned measurement issues, there might still be a bias resulting from omitted characteristics that influence the dependent variable ‘pay satisfaction’ as well as the procedural factor. It could be that people who are by nature more satisfied with any aspect of their work are inclined to rate also the frequency of being asked on pay issues more positively. Alternatively, there could be reverse causality: people who are generally satisfied with their work are simply more frequently asked by their superiors on pay issues, e.g. because they know that these people are less likely to complain. We address these problems by including three additional variables in specification D which measure workers’ satisfaction with respect to other work aspects. These are satisfaction with ‘the amount of influence you have over your job’, ‘the sense of achievement you get from your work’ and ‘the respect you get from supervisors’. Including these variables should lower the estimate for procedural utility to zero if an omitted personal characteristics bias or reverse causality is present in the data. However, the effect for procedural utility is hardly changed. The three additional satisfaction measures are highly correlated with the dependent variable pay

---

<sup>14</sup>Answers are coded on a four point scale ranging from ‘frequently’ (4), ‘sometimes’ (3), ‘hardly ever’ (2) and ‘never’ (1).

satisfaction, but they seem to capture other aspects determining utility from pay.<sup>15</sup> Thus, we are led to conclude that the procedural factor indeed identifies procedural utility of being asked about pay issues in workers' reported satisfaction with pay.

Lastly, we conduct some further sensitivity analysis by using a different approach of measuring outcome utility. In panel E in table 3, instead of the hourly wages, the twelve wage categories of the WERS are included as dummy variables, while controlling for average weekly hours and paid and unpaid overtime hours worked. The results indicate that outcome utility is a robust phenomenon; moreover, it is strictly increasing in wage rates, which further indicates that outcome utility is likely to be assessed correctly. The estimate on the procedural utility variable is not affected by this change in specification.

## 5 Conclusions

The concept of procedural utility extends the outcome-oriented approach to human well-being in economics. It proposes that people have preferences about *how* outcomes are generated. These preferences about procedures yield themselves procedural utility. In this procedural approach, people's concerns about the conditions under which outcomes are generated are *not* instrumental in a sense that people expect beneficial outcomes.

In this paper, organisational practices at the workplace are considered a possible source of procedural utility. Employees may have a preference for institutions that give them a say in pay issues. They may appreciate the possibility of voice as such as well as the quality of treatment and communication with superiors it imposes. The proponents of 'industrial democracy' as well as the 'human relations movement' have long been arguing that how workers are treated, e.g. whether they are given autonomy and participation possibilities in decisions concerning their workplace, has some value in itself.

The results of our empirical analysis are consistent with this notion of procedural utility. For a representative sample of more than 20,000 British workers, we find that being asked on pay issues contributes to workers' well-being measured by their satisfaction with pay. This effect holds over and above the effects of employees' wage levels and work inputs on pay

---

<sup>15</sup> Note that the WERS98 does not include a question on overall job satisfaction that could be included in the regression. However, including such a variable would not seem appropriate. If an equilibrium approach holds with respect to job satisfaction (i.e., any satisfaction in a specific area of a job, like pay, is compensated elsewhere in the job, such that in equilibrium, job satisfaction is equalized across workers *cet. par.*), then our procedural effect would by necessity be lowered to zero when an overall job satisfaction variable is included in the regression. In contrast, the satisfaction measures for other work aspects used can be expected to sufficiently capture unobserved individual characteristics or reverse causality.

satisfaction. The effect is also robust to powerful alternative explanations. In the most conservative estimation we still find a substantial procedural utility effect. If an employee is ‘hardly ever’ asked on pay issues rather than ‘sometimes’ her wage has to be increased by approximately 15 percent in order to keep her pay satisfaction constant.

We do *not* find that procedural utility is restricted to employees with an unfavourable outcome, i.e. a relatively low wage. This evidence thus contradicts the cynical view that procedural utility is merely used instrumentally by employers to offset poor compensation. Moreover, the finding makes it difficult to reinterpret procedural utility as false consciousness.

While the study of pay satisfaction is not the prime goal of the paper, the empirical findings may also contribute to its understanding. It is shown that organisational practices have a robust effect on pay satisfaction. Pay satisfaction may be a goal in itself as it contributes to people’s well-being. Moreover, the relevance of pay satisfaction for pro-social organisational behaviour is well documented.

Overall, the concept of procedural utility contributes to a better understanding of what individuals value. We submit that individuals gain utility from procedures over and above the outcome that is thereby generated. In particular for work relationships, it is shown that employees’ derive substantial utility from having a say in pay procedures.

## References

- Becker, G. S. (1976). *The Economic Approach to Human Behaviour*. Chicago: Chicago University Press.
- Bewley, Truman E. (1999). *Why Wages Don't Fall During a Recession*. Cambridge and London: Harvard University Press.
- Brockner, Joel and Batia M. Wiesenfeld (1996). An Integrative Framework for Explaining Reactions to Decisions: Interactive Effects of Outcomes and Procedures. *Psychological Bulletin* 120(2): 189-208.
- Clark, Andrew E. and Andrew J. Oswald (1994). Unhappiness and Unemployment. *Economic Journal* 104(424): 648-659.
- Clark, Andrew E. and Andrew J. Oswald (1996). Satisfaction and Comparison Income. *Journal of Public Economics* 61(3): 359-381.
- Cohen-Charash, Yochi and Paul E. Spector (2001). The Role of Justice in Organizations: A Meta-Analysis. *Organizational Behavior and Human Decision Processes* 86(2): 278-321.
- Deci, Edward L. and Richard M. Ryan (2000). The "What" and "Why" of Goal Pursuits: Human Needs and the Self-determination of Behavior. *Psychological Inquiry* 11(4): 227-268.
- Department of Trade and Industry (1999). Workplace Employee Relations Survey: Cross-Section, 1998 [computer file]. Colchester: The Data Archive [distributor], 22 December 1999. SN: 3955.
- Di Tella, Rafael, Robert J. MacCulloch and Andrew J. Oswald (2001). Preferences over Inflation and Unemployment: Evidence from Surveys of Happiness. *American Economic Review* 91(1): 335-341.
- Diener, Ed, Eunkook M. Suh, Richard E. Lucas and Heidi L. Smith (1999). Subjective Well-Being: Three Decades of Progress. *Psychological Bulletin* 125(2): 276-303.
- Easterlin, Richard A. (2001). Income and Happiness: Towards a Unified Theory. *Economic Journal* 111(473): 465-484.
- Falk, Armin and Urs Fischbacher (2000). A Theory of Reciprocity. Working Paper No. 6. Institute for Empirical Research in Economics, University of Zurich.
- Falk, Armin, Ernst Fehr and Urs Fischbacher (2000). Testing Theories of Fairness - Intentions Matter. Working Paper No. 63, Institute for Empirical Research in Economics, University of Zurich.
- Fehr, Ernst and Simon Gächter (2000). Fairness and Retaliation: The Economics of Reciprocity. *Journal of Economic Perspectives* 14(3): 159-181.
- Fehr, Ernst and Klaus M. Schmidt (2002). Theories of Fairness and Reciprocity - Evidence and Economic Applications. Forthcoming in: Dewatripont, M. et al. (eds). *Advances in Economic Theory*. Eighth World Congress of the Econometric Society.
- Frey, Bruno S. and Alois Stutzer (2000). Happiness, Economy and Institutions. *Economic Journal* 110(466): 918-938.
- Frey, Bruno S. and Alois Stutzer (2002a). Beyond Outcomes: Measuring Procedural Utility. Berkeley Olin Program in Law & Economics, Working Paper Series, WP No. 63.
- Frey, Bruno S. and Alois Stutzer (2002b). *Happiness and Economics: How the Economy and Institutions Affect Human Well-Being*. Princeton: Princeton University Press.
- Frey, Bruno S. and Alois Stutzer (2002c). What Can Economists Learn from Happiness Research? Forthcoming in *Journal of Economic Literature* 40: 402-435.



- Fried, Yitzhak (1991). Meta-Analytic Comparison of the Job Diagnostic Survey and Job Characteristics Inventory as Correlates of Work Satisfaction and Performance. *Journal of Applied Psychology* 76(5): 690-697.
- Greenberg, Jerald and Russell Cropanzano (eds) (2001). *Advances in Organizational Justice*. San Francisco, CA: New Lexington Press.
- Hamermesh, Daniel (1977). Economic Aspects of Job Satisfaction. In: Ashenfelter Orley and Oates, Wallace (Eds.). *Essays in Labor Market Analysis*. New York: John Wiley.
- Harsanyi, John C. (1993). Normative Validity and Meaning of von Neumann-Morgenstern Utilities. In: Binmore Ken, Kirman Alan and Tani Piero (eds) *Frontiers of Game Theory*. Cambridge & London: MIT Press: 307-320.
- Heneman, Herbert G. and Donald P. Schwab (1985). Pay Satisfaction: Its Multidimensional Nature and Measurement. *International Journal of Psychology* 20(2): 129-141.
- Juster, F. Thomas and Frank P. Stafford (eds) (1985). *Time, Goods, and Well-Being*. Ann Arbor: Institute for Social Research, The University of Michigan.
- Kahneman, Daniel, Ed Diener and Norbert Schwarz (eds) (1999). *Well-Being: The Foundation of Hedonic Psychology*. New York: Russell Sage Foundation.
- Kahneman, Daniel, Jack L. Knetsch and Richard H. Thaler (1986). Fairness as a Constraint on Profit Seeking: Entitlements in the Market. *American Economic Review* 76(4): 728-741.
- Kahneman, Daniel, Peter P. Wakker and Rakesh Sarin (1997). Back to Bentham? Explorations of Experienced Utility. *Quarterly Journal of Economics* 112(2): 375-405.
- Kim, W. Chan and Renée Mauborgne (1998). Procedural Justice, Strategic Decision Making, and the Knowledge Economy. *Strategic Management Journal* 19: 323-338.
- Lane, Robert E. (1988). Procedural Goods in a Democracy. *Social Justice Research* 2(3): 177-192.
- Lawler, Edward E. III (1976). Participation and Pay. *International Journal of Production Research* 14(3): 367-372.
- Le Menestrel, Marc (2001). A Process Approach to the Utility for Gambling. *Theory and Decision* 50(3): 249-262.
- Lind, E. Allan and Tom R. Tyler (1988). *The Social Psychology of Procedural Justice*. New York: Plenum Press.
- Marschak, Jacob (1950). Uncertain Prospects, and Measurable Utility. *Econometrica* 18: 111-141.
- Martin, Christopher L. and Nathan Bennett (1996). The Role of Justice Judgments in Explaining the Relationship Between Job Satisfaction and Organizational Commitment. *Group and Organization Management* 21(1): 84-104.
- Mulvey, Paul W., Marcia P. Miceli and Janet P. Near (1992). The Pay Satisfaction Questionnaire: A Confirmatory Factor Analysis. *Journal of Social Psychology* 132(1): 139-141.
- Oswald, Andrew J. (1997). Happiness and Economic Performance. *Economic Journal* 107(445): 1815-1831.
- Pascal, Blaise (1670). *Pensées*. Paris: Port-Royal.
- Rabin, Matthew (1993). Incorporating Fairness into Game Theory and Economics. *American Economic Review* 83 (5): 1281-1302.
- Rabin, Matthew (2002). A Perspective on Psychology and Economics. Forthcoming in *European Economic Review*.

- Rosen, Sherwin (1986). The Theory of Equalizing Differences. In: Orley Ashenfelter and Richard Layard (eds) *Handbook of Labor Economics*, Volume 1. Amsterdam, Oxford and Tokyo: North-Holland: 641-692.
- Schroth, Holly A. and Priti Pradhan Shah (2000). Procedures: Do We Really Want to Know Them? An Examination of the Effects of Procedural Justice on Self-Esteem. *Journal of Applied Psychology* 85(3): 462-471.
- Thibaut John and Laurens Walker (1975). *Procedural Justice: A Psychological Analysis*. Hillsdale, NJ: Erlbaum.
- Tremblay, Michel, Bruno Sire and David B. Balkin (2000). The Role of Organizational Justice in Pay and Employee Benefit Satisfaction, and Its Effects on Work Attitudes. *Group and Organization Management* 25(3): 269-290.
- Tyler, Tom R. and Steven L. Blader (2000). *Cooperation in Groups: Procedural Justice, Social Identity, and Behavioral Engagement*. Philadelphia, PA: Psychology Press.
- Tyler, Tom R., Robert J. Boeckmann, Heather J. Smith and Yuen J. Huo (1997). *Social Justice in a Diverse Society*. Boulder, CO: Westview Press.
- Viscusi, W.Kip (1993). The Value of Risks to Life and Health. *Journal of Economic Literature* 31(4): 1912-1946.
- von Neumann, John and Oskar Morgenstern (1944). *Theory of Games and Economic Behavior*. Princeton: Princeton University Press.