Emotions, Morality and Public Goods:
The WTA-WTP Disparity Revisited

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Abstract. Empirical evidence suggests that people's maximum willingness to pay for having a good is often substantially lower than their minimum willingness to accept *not* having it, and that this discrepancy tends to be especially large when valuing public goods. This paper hypothesizes that differences in emotions (e.g. regret) and moral perceptions can account for much of this discrepancy for public goods. A simple, real-money dichotomous-choice experiment is set up to test these hypotheses, which are largely supported.

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1. Introduction

The large disparity often observed between people's maximum willingness to pay for a good (WTP) and their minimum willingness to accept not having it (WTA) continues to be a puzzle; see e.g. Bateman et al. (2005) and Plott and Zeiler (2005a, b) for careful experimental contributions that aim to identify why and when such disparities exist, and Huck, Kirchsteiger and Oechssler (2005) for possible evolutionary arguments behind them. This paper focuses on the valuation of public goods, where the observed discrepancy appears to be particularly large, based on stated-preference methods such as the contingent valuation (CV) method. Indeed, this discrepancy has often been put forward as evidence that such methods are notoriously unreliable; see e.g. Diamond and Hausman (1994).

Conventional microeconomic theory implies that an individual is *on the margin* willing to pay just as much for obtaining a good as he or she is willing to accept forsaking it. At the same time it predicts that WTA exceeds WTP for discrete (i.e. non-marginal) changes for normal goods. Of course, survey-based and experimental empirical tests are typically based on discrete changes, and one almost always finds that WTA exceeds WTP, often by a substantial margin (Horowitz and McConnell, 2002). Whether the observed discrepancies can be explained within this framework is debated, however. Randall and Stoll (1980) derived bounds that seem to indicate that the WTA-WTP difference, based on standard theory, should in general be quite small, given plausible assumptions such as how marginal WTP varies with income. However, Hanemann (1991) derived other conditions that highlight the degree of complementarity between income and the good to be valued. He argued that observed large WTA-WTP discrepancies are consistent with standard theory, given low complementarity between the public good and income as reflected by a small elasticity of substitution between them; Shogren et al. (1994) and Amiran and Hagen (2003) argue along similar lines. Sugden (1999) and Horowitz and McConnell (2003), on the other hand, argue that the Hanemann

argument is not at all sufficient to explain observed results from CV studies, and hence that one must move beyond mainstream theory to understand the data. There is no sign of an approaching consensus on this issue.

The first purpose of this paper is therefore to set up a simple but clean experiment where the monetary outcomes are exactly the same in two framings. If a difference remains (as is the case with our experiment), we can then unambiguously conclude that the observed behaviour is not consistent with standard theory. The second purpose is to contribute to the explanation of what drives this discrepancy for public goods by experimentally testing whether asymmetric emotions and moral norms are important.

Several explanations have been suggested beyond the standard microeconomic theory, the most prominent being loss aversion (Kahneman and Tversky, 1979; Tversky and Kahneman, 1991), i.e. that losses (reflected by WTA) tend to loom larger than gains (reflected by WTP); see e.g. Kahneman, Knetsch and Thaler (1990) and Knetsch (1989, 2000). However, loss aversion *per se* cannot explain the observed regularity that the WTP-WTP-disparity tend to be much larger for public goods, such as environmental goods; see the recent meta-analyses by Horowitz and McConnel (2002) and Sayman and Öncüler (2005). Horowitz and McConnel summarize that "the farther a good is from being an 'ordinary private good', the higher the ratio" (p. 442). A possible explanation for this pattern is instead that public good choices are perceived to have a more obvious ethical dimension, since the individual choices also affect (or are perceived to affect) others (Johansson-Stenman and Svedsäter, 2005). Kahneman and Knetsch (1992) suggested that the amount that is reported in survey-based hypothetical WTP studies may not primarily express the respondent's value of the good, but rather a "moral satisfaction" of behaving in an ethically admirable way, corresponding to the so-called "warm glow" hypothesis (Andreoni 1989, 1990). Others have suggested that the influence of a moral perspective may be particularly strong under WTA

(Boyce et al., 1992; Irwin, 1994; Nyborg, 2000; Sayman and Öncüler, 2005). This parallels the distinction between omission and commission, since to refrain from contributing is an act of omission while accepting payment is an act of commission. Empirical evidence suggests that acts of omission causing harm are typically perceived as less blameworthy than acts of commission that cause an equal amount of harm (Baron and Ritov, 1994; Spranka, Minsk and Baron, 1991).

According to a leading brain researcher, Jonathan Cohen (2005, 3): "Emotions influence our decisions. They do so in just about every walk of our lives, whether we are aware of it and whether we acknowledga it or not." However, although already Adam Smith discussed the role of emotions extensively, in particular in his *Theory of Moral Sentiments* (Evensky, 2005; Ashraf, Camerer and Loewenstein, 2005), economics has traditionally had little to say about them, in particular empirically. According to Bosman et al. (2005, 408) "there is hardly any empirical economic research among emotions." This is about to change, however. This is partly a result of the insights from the emerging field of neuroeconomics (see e.g. Camerer et al., 2005; Fehr, Fischbacher and Kosfeld, 2005; Singer and Fehr, 2005), and partly due to influences from psychology. Psychologists Peters, Slovic and Gregory (2003) suggested that the WTP-WTA disparity could be accounted for by different emotional reactions. In a recent CV study of an ordinary market good (lottery tickets), they found that the disparity between the WTA and the WTP conditions was largest for those tickets that evoked the strongest emotions.

In this paper we set up a simple experiment to test directly whether or not differences in emotions and/or moral perceptions between the WTA and the WTP framings can account for much of the WTA-WTP difference that is typically observed. Although earlier research has proposed moral reactions as a possible explanation for the WTA-WTP disparity, to the best of our knowledge no study has tested this assumption. Furthermore, as far as we know, no study

has investigated whether differences in emotions can account for observed WTA-WTP discrepancies for public goods. More specifically, we test the following hypotheses: *Hypothesis 1*: Those in the WTA condition donate to the public good to a larger extent than do those in the WTP condition. *Hypothesis 2*: Not donating to the public good causes stronger negative emotions, such as shame, in the WTA condition compared to the WTP condition. *Hypothesis 3*: Not donating to the public good is perceived to be less moral, or more immoral, when in the WTA condition than it is when in the WTP condition. *Hypothesis 4*: When correcting for differences in relevant negative emotions and moral perceptions, there is no remaining statistically significant difference between the conditions with respect to the extent that people donate to the public good. If Hypothesis 4 is correct, then emotions and moral perceptions account for all or almost all of the WTP-WTP discrepancy observed. The empirical results turn out to be broadly consistent with all of these hypotheses.

2. The experiment

99 students, who were all recruited from a pool of subjects, participated in the study. Participants were randomly assigned to two groups of approximately the same size with 34 females and 17 men in the WTA group and 28 females and 20 men in the WTP group.

The study was conducted as a single real-money dichotomous-choice experiment. This procedure was chosen because we wanted to make certain that the monetary choice conditions were identical in both conditions. One week before the actual experiment, participants were contacted by email. Once they had accepted to participate in a study, a new email informed participants about the prerequisites of the condition that they were randomly assigned to. Participants in the WTP condition were informed that they would receive SEK 150 (approximately 20 US dollars) for their participation. They were also given one of two instructions (see Appendix). In the WTA group, participants were instead informed that we

would pay them SEK 50 for participating, and that in addition SEK 100 would be donated to the World Wide Fund for Nature's (WWF) ongoing project "Protecting the Swedish otter". We assumed that most people have a favourable attitude towards the WWF, and believe that the organization contributes to environmental protection. Since the otter project was presently going on in Sweden, the decision situation, to be introduced in the experiment, was realistic. None of the participants in either group declined participation after they were informed about their compensation.

At the time of the experiment, participants were reminded about their compensation. At the same time, they were informed that they now had a choice. Those in the WTA condition were told that rather than donating to the WWF, they could keep all money for themselves. Participants in the WTP condition were informed that although they could keep all the money, they could also split it up and donate SEK 100 to WWF and their otter project, while keeping SEK 50 for themselves. It was emphasised that the choice was entirely up to them. Furthermore, we used a double-blind procedure, and the instructions made clear that the choice was perfectly anonymous (see appendix). The money and, where appropriate, a receipt for the payment to WWF was sent home within a week after the experiment. Such a procedure was used since there is evidence that the degree of anonymity may strongly affect people responses to this type of question (Hoffman et al., 1994; List et al., 2004).

Hence, participants in both groups chose between keeping all money for themselves (alternative A) and donating SEK 100 to the WWF and keeping SEK 50 (alternative B). Consequently, even if one believes the Hanemann (1991) explanation based on conventional microeconomic theory for the typically observed WTA-WTP discrepancy, it can clearly not explain any differences here, since the monetary outcomes are identical in both settings.

After they had been instructed about their choice alternatives, but before they made their choice, participants rated *affect* with regard to choosing A and B, respectively. We use self-

reported emotions following e.g. Bosman and van Winden (2002) and many studies in psychology.[1] Following Peters, Slovic and Gregory (2003), the posed question was: If you choose alternative A/B, how would you feel?, followed by sixteen emotions. Each emotion was measured on a scale that ranged from "not at all" (0), "a little" (1), "slightly" (2), "quite a bit" (3), to "very intense" (4). Eleven of the emotions represented the negative domain and were sampled from PANAS-X (Watson and Clark, 1994) or Higgins (1987): dissatisfied with self, disgusted with self, ashamed, guilty, uncomfortable, annoyed, tense, uneasy, bothered, embarrassed and feeling downcast. To this regretful was added. Also included were four emotions, taken from the same sources, measuring positive affect: happy, satisfied, calm and confident. *Immoral* was captured by asking to what extent it was perceived to be morally good or bad to choose alternative A and B, respectively. Responses were given on seven-point scales, which were anchored by "morally very bad" (6) to "morally very good" (0) with the mid-point "neither morally good nor bad" (3).

3. Results

Table 1 reveals that the donation choices differ significantly and substantially between the framings; in the WTP setting only 9 out of 48 participants chose to donate while in the WTA group 23 out of 51 shared their compensation with WWF. Thus, those in the WTA condition were more likely to donate than participants in the WTP group, consistent with *Hypothesis 1*.

Table 1 about here

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[1] This is the by far most common method in psychology, and it is generally not considered to be less reliable than physiological measures (e.g. skin conductance or neural responses) or behavioural changes such as facial expressions. According to Robinson and Clore (2002, 934): "Self-report is the most common and potentially the best (…) way to measure a person's emotional experiences." Ben-Shakhar et al. (2004) found a positive correlation between self-reported and physiologically measured emotions, and argued that this finding supports the use of self-reported emotions.

The reported strength of the negative feelings from not donating to the WWF generally appears to be quite weak. This is not surprising given that a clear majority chose not to donate. Moreover, the reported strength for all negative emotions was stronger from within the WTA framing, consistent with *Hypothesis 2*. The clearest differences were found for the negative emotions *Annoyed, Disgusted with self, Regretful, Uncomfortable, Dissatisfied with self* and *Ashamed*, which follows intuition given the moral character of the issue. We have no clear hypotheses regarding the emotions associated with choosing the altruistic alternative, i.e. donating to the WWF-project, and none of these differences were significant based on a simple equal means *t*-test. Consistent with *Hypothesis 3*, we also found that the perceived degree of immorality for choosing not to donate was higher in the WTA framing.

In order to test *Hypothesis 4* we ran a probit regression where the choice to donate (or not) was the dependent variable. In model 1, where we do not correct for emotions or perceived immorality, the parameter associated with the WTA framing is positive and highly significant, again consistent with *Hypothesis 1*. Perhaps not very surprisingly, all the negative emotions discussed (for which there are significant differences between the framings) are strongly positively correlated; the same applies for the correlation between perceived immorality and these negative emotions. This implies a potential problem of multicollinearity, which makes it difficult to separate the effects of the different emotions and immorality. The pattern observed in Model 2, where we include all of the negative emotions discussed, is typical for a model with multicollinearity. For example, the sign of the parameter assocated with the emotion *Annoyed* is negative (and significant at about the 15% level). Yet, when we ran models with only one emotion or perception of immorality (in addition to an intercept and the dummy variable for framing), the associated parameters where always significant at the 5% level or better. In order to deal with these problems we apply the extreme bound analysis suggested by Leamer (1983, 1985). In doing so we always included an intercept and the

framing dummy variable. Then we included all combinations of emotions and/or immorality, i.e. from one variable to seven, implying 127 regressions in total. A variable is then considered robust if the associated parameter does not change sign and always has a *t*-statistic of two or higher, so that the parameter in each of the regressions is significant at the 5% level or better. In our case it turned out that the variables *Disgusted with self* and *Regretful* are robust, and that no other variables were (as is already evident from model 2). Therefore we ran the regressions with only these emotions together with *Immorality* in Model 3, and without *Immorality* in Model 4. However, as argued e.g. by Sala-i-Martin (1997), the extreme bound analysis is quite restrictive. Even though this implies a strong support for the importance of the emotions *Disgusted with self* and *Regretful*, it is less straight-forward to argue that the other emotions and perceived immoralities are unimportant.

Table 2 about here

Based on likelihood ratio tests we can reject model 1 in favour of either model 2, 3 or 4 individually at the 1% significance level. However, we cannot reject either model 3 or 4 in favour of model 2, or model 4 in favour of model 3, at the 10% level. We also included a gender variable, and for a sub-sample a variable reflecting the extent to which environmental values serve as a guiding principle in life,[2] but the associated parameters were never significant at conventional levels (these results are available from the authors). The latter finding supports earlier evidence, that stated responses often constitute poor predictions of real behaviour (e.g. Glaeser et al., 2000).

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[2] One month before the experiment, a subset of the participants ($n = 58$) had filled in a longer questionnaire. Part of this questionnaire consisted of the Portrait Value Questionnaire, an instrument that contains 40 items measuring one value each (Schwartz et al., 2001). One of these values reflected the extent that environmental values serve as a guiding principle in life.

In line with *Hypothesis 4*, the WTA parameter is statistically insignificant at conventional levels. Thus, the results suggest that affective responses could account for most of the WTA-WTP discrepancy typically observed when valuing public goods. Since there is no corresponding ethical dimension when valuing private goods, this finding resembles the result in Plott and Zeiler (2005a), who found that the WTA-WTP discrepancy for private goods (lotteries and mugs) becomes insignificant when they use a design that is incentive compatible (like ours) and that simultaneously attempts to control for different kinds of misconceptions. Similarly, Bateman et al. (2005) also used private goods (luxury chocolates) and found quite small differences for most comparisons.

4. Conclusion

The empirical results in this paper broadly confirm the previously stated, but not tested, hypotheses (e.g. Boyce et al. 1992) that the WTA-WTP discrepancy when valuing public goods is largely a result of asymmetric emotional experiences and moral perceptions in the two cases. When correcting for affective influences and moral reactions, we found no significant remaining difference between the WTA and the WTP framings. Moreover, the same influences and reactions may well explain why the observed WTA-WTP gap is typically larger for public goods than for private goods.

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Table 1. Mean index values of choice (donate or not), emotions (scale 0-4) and Immorality (scale 0-6), for the WTP and WTA framings, respectively. Standard deviations are presented in Parentheses. Alternative A implies SEK 150 to oneself, whereas alternative B implies SEK 50 to oneself and SEK 100 to WWF (irrespective of framing).

	WTP-framing	WTA-framing	*t*-test for equal means Prob-value	Wilcoxon-Mann-Whitney test for the same underlying distribution Prob-value (2-tailed)
Share donating to WWF	18.7%	45.1%	0.005[***]	0.005[***]
Anticipated emotions if choosing A (not donate)				
Annoyed	0.79	1.33	0.008[***]	0.004[***]
Embarrassed	0.81	1.16	0.088[*]	0.099[*]
Uneasy	0.91	1.10	0.395	0.329
Happy	2.44	2.08	0.138	0.138
Disgusted with self	0.79	1.33	0.012[**]	0.014[**]
Regretful	0.79	1.39	0.007[***]	0.009[***]
Tense	0.75	0.96	0.230	0.177
Calm	2.46	2.31	0.504	0.796
Feeling downcast	0.46	0.65	0.280	0.525
Bothered	0.73	0.96	0.249	0.132
Guilty	0.83	1.12	0.180	0.091[*]
Satisfied	2.08	1.78	0.197	0.174
Dissatisfied with self	0.75	1.53	0.000[***]	0.001[***]
Uncomfortable	0.90	1.29	0.059[*]	0.050[**]
Ashamed	0.62	1.29	0.001[***]	0.000[***]
Confident	2.48	2.29	0.461	0.498
Anticipated emotions if choosing B (donate)				
Annoyed	0.71	0.57	0.447	0.218
Embarrassment	0.25	0.24	0.899	0.609
Uneasy	0.62	0.57	0.747	0.918
Happy	2.19	2.51	0.156	0.096[*]
Disgusted with self	0.79	0.63	0.402	0.637
Regretful	1.15	0.88	0.260	0.251
Tense	0.62	0.49	0.429	0.636
Calm	2.29	2.45	0.466	0.362
Feeling downcast	0.54	0.47	0.661	0.539
Bothered	0.35	0.39	0.786	0.950
Guilty	0.29	0.29	0.987	0.755
Satisfied	2.31	2.45	0.552	0.470
Dissatisfied with self	0.79	0.68	0.601	0.421
Uncomfortable	0.54	0.49	0.773	0.940
Ashamed	0.15	0.14	0.934	0.923
Confident	2.42	2.57	0.531	0.351
Perceived Immorality if choosing A (not donate)	3.04	3.76	0.016[**]	0.022[**]
Perceived Immorality if choosing B (donate)	1.22	1.00	0.298	0.170
n	48	51		

Superscripts *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, or better, respectively.

Table 2. Choice to donate. Probit regression, marginal effects; *t*-values (absolute values) in parenthesis. The explanatory variables reflect the WTA framing (scale 0-1) and the emotions (scale 0-4) and perceived immorality (scale 0-6) of choosing alternative A, i.e. not to donate.

	Model 1	Model 2	Model 3	Model 4
Constant	-0.313*** (5.23)	-0.826*** (2.94)	-0.848*** (3.11)	-0.996 (6.86)
WTA	0.263*** (2.94)	0.134 (1.20)	0.121 (1.13)	0.125 (1.16)
Annoyed		-0.142 (1.45)		
Disgusted with self		0.212*** (2.54)	0.186*** (2.79)	0.194*** (2.92)
Regretful		0.195*** (2.65)	0.142*** (2.39)	0.156*** (2.77)
Dissatisfied with self		-0.001 (0.02)		
Uncomfortable		-0.026 (0.33)		
Ashamed		-0.069 (0.89)		
Immorality		0.023 (0.51)	0.029 (0.63)	
Log likelihood	-58.27	-37.35	-39.01	-39.21
n	99	99	99	99

Superscripts *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, or better, respectively.

Appendix: Instructions to participants (translated from Swedish)

Initial information to the respondents in the WTP-treatment:

Welcome, and thank you for participating in this study!

In line with earlier information, you will receive SEK 150 as a compensation for your participation.

If you wish, you may now choose to donate SEK 100 out of the 150 to the World Wide Fund for Nature's (WWF) ongoing project "Protecting the Swedish Otter" instead.

Initial information to the respondents in the WTP-treatment:

Welcome, and thank you for participating in this study!

In line with earlier information you will receive SEK 50 while SEK 100 will be donated to the World Wide Fund for Nature's (WWF) ongoing project "Protecting the Swedish Otter".

If you wish you may now choose to keep the SEK 100 that would otherwise had gone to WWF.

[The following part of the instructions was identical for both treatments.]

We have no opinion on the matter at hand and your choice is completely anonymous. You will receive your money and, if applicable, a receipt for the donation to WWF in your mailbox within a week from now.

To guarantee anonymity, the payment will be made as follows: Next to you is an envelope where you write your name and the address to which the money should be sent. After you have done that, place the envelope upside down. When you are through with the questionnaire, leave it on the table. Our research assistant will check which option you chose. He then puts the corresponding amount in the envelope *without looking at your address*. Should you choose to donate to WWF, the same assistant will pay in and put the receipt in the same envelope. He will then post it and you will receive the envelope within a week. This procedure is used to guarantee complete anonymity. In the data set that will be analysed by the researchers, no names or any other information that can be used to identify individuals will appear. Nobody except yourself will know which choice you made.

If you have understood the instructions, please turn to the next page.
(New page)
You may choose between two alternatives, A and B.

Alternative A. You will receive SEK 150
Alternative B. You will receive SEK 50 and WWF SEK 100

Before you make your choice, If you chose alternative A, how would you feel? (you receive SEK 150):

	Not at all	A little	Slightly	Quite a bit	Very intensive
Annoyed	❑	❑	❑	❑	❑
…	…	…	…	…	…
…	…	…	…	…	…
Tense	❑	❑	❑	❑	❑

(New page)
If you chose alternative B, how would you feel ? (you receive SEK 50 and WWF receive SEK 100):

	Not at all	A little	Slightly	Quite a bit	Very intensive
Annoyed	❑	❑	❑	❑	❑
…	…	…	…	…	…
…	…	…	…	…	…
Tense	❑	❑	❑	❑	❑

(New page)
Now it is time for you to make your choice. Again, we have no opinion on the matter in hand and your choice is completely anonymous.

Do you choose alternative A or B?

❑ Alternative A. You will receive SEK 150
❑ Alternative B. You will receive SEK 50 and WWF SEK 100

(New page)
Many factors can affect the choice of consumers or citizens. In certain areas, moral aspects could play a role. Consider the choice you just made from a moral perspective.

How morally good or bad do you consider Alternative A (you receive SEK 150) to be?

❑	❑	❑	❑	❑	❑	❑
Morally very bad	Morally pretty bad	Morally rather bad	Neither nor	Morally rather god	Morally pretty god	Morally very god

How morally good or bad do you consider Alternative B (you receive SEK 50 and WWF receive SEK 100) to be?

❑	❑	❑	❑	❑	❑	❑
Morally very bad	Morally pretty bad	Morally rather bad	Neither nor	Morally rather god	Morally pretty god	Morally very god

Thank you for your assistance!