

# Anchoring and yea-saying with private goods: an experiment.

By,

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**Abstract**

Anchoring or starting point effects and yea-saying have been suggested as explanations of responses in some contingent valuation exercises. We use the control offered by the laboratory to investigate the competing roles of these effects using two private goods and real cash payments. For both goods we find strong evidence for yea-saying in both willingness to pay and willingness to accept formats. Anchoring or starting point effects are less evident in our data, which may be due to the familiarity of the goods to the subjects.

## **Introduction<sup>1</sup>**

Elicitation effects in contingent valuation methodology (CVM) are said to occur when responses gathered from subjects are sensitive to the method of elicitation in a manner inconsistent with standard, Hicksian consumer theory. Two widely reported elicitation effects are starting point effects and yea-saying. Starting point effects (SPE) occur when reported valuations are correlated with some initial valuation cue, such as the bid value in dichotomous choice (DC) questions. Yea-saying describes the phenomenon of a subject agreeing to a proposal in the form of a direct question that she or he would reject under other conditions. For instance, a subject may agree to a bid price in a dichotomous choice format but then provide a lower stated valuation in a subsequent valuation exercise. A key difference between the two elicitation effects is that yea-saying is a unidirectional phenomenon, i.e., it raises willingness to pay or reduces willingness to accept whereas starting point bias can work in either direction depending on the value of the cue.

This chapter reports on an experiment designed to test for both types of elicitation effect within the context of a real market for two private goods in an incentive compatible setting. One aim of the experiment is to examine the robustness of such effects; specifically, do they occur when subjects must make real rather than hypothetical choices and when the objects of choice are private rather than public goods? The second aim of the experiment is to distinguish between the two effects.

## **Background.**

In the context of valuation, anchoring occurs when an individual's reported or revealed valuation is correlated with some prior numerical cue. Since its preliminary identification by Slovic and Lichtenstein, 1971 manifestations of anchoring have been identified in numerous and diverse settings including the guessing of answers to multiplication problems and estimating the number of African countries in the United Nations (Tversky and Kahneman, 1982). In these sorts of problems, subjects have the seemingly simple task of saying whether the true answer is above or below some initial suggested answer that has been offered by the organiser. A particularly stark example of anchoring can be found in the recent work of Ariely et al, 2003, who asked subjects for the final two digits of their US social security number and found that it was closely correlated with individuals' subsequent valuations of a variety of unfamiliar goods.

In the popular iterative bidding format of CVM, subjects are offered a controlled sequence of opportunities to give information about their valuation of a good. For instance, the experimenter may ask the subject if they are willing to pay  $x$  (the 'starting point') for an improvement in a public good and then, in a follow-up question, ask the subject to state a maximum willingness to pay. Intended as an improvement upon the open-ended format (OE), the iterative bidding CVM revealed that final open-ended valuations were often correlated with the initial value of  $x$  - hence the term, starting point effect (Rowe et al, 1980; Brookshire et al, 1981; Schulze et al, 1981; Boyle et al, 1985; Kealy et al, 1988; Boyle and Bishop, 1988; Cameroon and Quiggin, 1994; Bateman et al, 1995; Herriges and Shogren, 1996).

Anchoring is one possible reason for SPE, with the anchor provided by the initial value of  $x$  offered to subjects. The initial bid value might act as a clue or hint towards the

good's value, especially when respondents are confused or unfamiliar with the good concerned (Brookshire et al, 1981; Bishop et al, 1983; Kealy et al, 1993; McFadden, 1994; Brown et al, 1996). Since the domain of CVM largely involves the valuation of unfamiliar, non-marketed goods, this starting point problem has become recognised as a potentially serious flaw inherent in iterative bidding techniques. (Boyle et al, 1985, p.193).

The DC protocol offers an alternative to bidding games. It has been suggested that this approach might simulate a more market like setting, since it involves a simple accept-reject bid decision. The increased simplicity might help subjects to feel more comfortable answering a CVM valuation question (Seller et al, 1985). Furthermore, CVM surveys are typically limited by time, information, interaction, consultation and market experience all of which may cause subjects to become rather uncertain about their responses. If subjects only have to think whether their true value is above or below some suggested amount, the whole valuation process may be simplified (Bishop et al, 1983). Comparisons between OE and DC formats have shown that OE mean and median estimates (of WTP) are consistently lower than the DC estimated means (Seller, Stoll, Chavas, 1985; Bishop, Heberlein and Kealy, 1983; Cummings, Harrison and Rutström, 1995; Brown et al, 1996; Ready et al, 1996; Boyle et al, 1996; Bateman et al, 1995). One view is that these results demonstrate that OE questioning is typically subject to strategic behaviour. This serves to confirm strong priors of free-riding incentives in the public good context. A second explanation is that just as in iterative bidding processes, anchoring may occur in the DC format.

An alternative explanation of these results is however offered by yea-saying. This phenomena is documented in the existing psychology literature (Arndt and Crane, 1975 and

Couch and Keniston, 1960), and is also becoming an issue of growing concern in the economics CVM literature (Kriström, 1993; Kanninen, 1995; Brown et al, 1996) as a possible influence on DC responses.

Brown et al (1996) proposed that the simplicity of the take-it-or-leave-it choice might generate a conflicting objective in response. Torn between answering truthfully and showing a positive preference, if a DC bid is above her/his maximum WTP, a subject may still respond positively because s/he would like to demonstrate a positive preference for the good in question. In addition to this, we might also include the notion of the good respondent (Orne, 1962). Orne described how subjects, when faced with officialdom, might respond positively to questions, only because they wrongly believe that such a response is exactly what the interviewer (in a position of perceived authority) wishes to hear.

Although some results can be interpreted as evidence for yea-saying some caution is warranted. Point estimates from DC data which are used to compare with moments from open-ended data, have been found to be rather dependent upon the original specification of the bid function and the Hanemann (1984) specifications have not been wholly supported (Cooper and Loomis, 1992). Given that many of the previous studies cited above compare OE with DC estimates based upon these functional specifications, it would be unwise to place too much emphasis on these studies as evidence of yea-saying.

Another approach, thereby avoiding the functional form problem entirely, is to test using synthetic data sets or implicit preferences. The synthetic DC responses are constructed by allocating a 'yes' if an OE valuation is greater than or equal to those bids used in the actual DC questioning. Differences between actual and implicit responses can then be tested.

Studies which have previously used these ‘synthetic’ data sets have revealed evidence to support the yea-saying tendency (Kriström 1993; Holmes and Cramer, 1995; Bateman et al, 1995; Boyle et al, 1996; Ready et al, 1996). The studies cited produce evidence based on stated preference exercises with hypothetical goods. It is not clear whether the results can be replicated with individuals making real choices about real goods, hence the value of a controlled experiment.

Perhaps the closest investigation to ours is that reported in Frykblom and Shogren, 2000, who use real choices and a split-sample design to value an environmental economics text using 108 Swedish university students. One group of students faced a Vickrey auction while the rest faced dichotomous choice (DC) questions with various bid levels. The authors argue that both yea-saying and anchoring will increase the acceptance of the proposal at high bid levels, while the two effects work in opposite directions for low bid levels. Hence it is possible to test between the impact of these two effects by comparing the distribution of values derived from the Vickrey auction with the upper and lower parts of the distribution derived from the DC exercise. In our experiment we have a larger sample size, two goods of different familiarity rather than one and we use a Becker-de Groot Marschak mechanism rather than the Vickrey auction. However, the major difference is that for some subjects, after the DC questions we also have follow-up open-ended (OE) valuation questions. If only anchoring occurs the values derived from open-ended questions should be consistent with the values from the DC questions, but if only yea-saying is present then the distribution of values derived from the OE questions should be independent of the bid level in the DC question and equal to the distribution obtained from subjects who face an open-ended question without a

prior DC question. This provides a clear cut means of distinguishing between anchoring and yea-saying. As we shall see, despite the differences in design between the two experiments we obtain broadly the same results: there is little evidence of anchoring, but the data shows large-scale yea-saying in the responses of the subjects.

## Experimental design.

Consider an agents' valuation of a unit increase in the level of a private good. Let  $wtp(v)$  be the maximum willingness to pay for the increase when the subject receives a prior exposure to the anchor value  $v$  and let  $wtp$  be the maximum willingness to pay when the subject faces no such anchor. For willingness to pay, an anchoring effect occurs if,

$$Wtp(v) > wtp \quad v > wtp$$

$$Wtp(v) < wtp \quad v < wtp.$$

Let  $P(x)$  be the proportion of the population whose  $wtp$  exceeds  $x$  in the absence of a common anchor and let  $P(x/v)$  be the proportion whose  $wtp$  exceeds  $x$  when each subject is exposed to the anchor value  $v$ . If anchoring occurs then,

$$P(x/v) > P(x) \quad x < v$$

$$P(x/v) < P(x) \quad x > v$$

It follows that,

$$\text{Median } wtp(v) > \text{median } wtp \quad v > \text{median } wtp$$

$$\text{Median } wtp(v) < \text{median } wtp \quad v < \text{median } wtp.$$

Figure 1 illustrates these relationships for the case where  $v < \text{median } wtp$ .

[Figure 1 here]

Meanwhile, let  $\pi(x)$  be the proportion of the population who agree that they are willing to pay at least  $x$ . Yea-saying occurs when,

$$\pi(x) > P(x).$$

For decreases in the level of the good, we can define similar notions. Let  $wta(v)$  be the minimum willingness to accept compensation for a unit decrease in the private good when the subject receives a prior exposure to the anchor value  $v$  and let  $wta$  be the minimum willingness to accept in the absence of such anchor. An anchoring effect occurs if,

$$Wta(v) > wta \quad v > wta$$

$$Wta(v) < wta \quad v < wta$$

Let  $R(x)$  be the proportion of the population whose  $wta$  exceeds  $x$  in the absence of a common anchor and let  $R(x/v)$  be the proportion whose  $wta$  exceeds  $x$  when each subject is exposed to the anchor value  $v$ . If anchoring occurs then,

$$R(x/v) > R(x) \quad x < v$$

$$R(x/v) < R(x) \quad x > v$$

Meanwhile, let  $1-\rho(x)$  be the proportion of the population who agree that they are willing to accept  $x$ . Yea-saying occurs when,

$$1-\rho(x) > 1-R(x) \text{ or } R(x) > \rho(x).$$

Table 1 summarises the predictions for anchoring and yea-saying as a whole.

[Table 1 here]

The basic design of the experiment follows from these definitions. In the first treatment valuations are elicited from subjects who receive no common anchor.<sup>2</sup> In the second treatment, subjects face two related questions, with the second immediately following

the first. The first involves a choice where an anchoring value is provided (e.g. are you willing to pay v?). In the second, valuations are elicited in a format identical to that used in the first treatment.

### ***Experimental Details.***<sup>3</sup>

#### **The goods.**

We used two private goods (a bottle of Cava semi-sparkling wine and a box of 240 teabags). As noted earlier, the results of previous studies (e.g. Kealy et al, 1993) have shown that if a subject has a high degree of familiarity with the good in question, the incidence of biases such as starting point and yea-saying could be significantly reduced. In this case, the intention was to select goods that encouraged some variance in familiarity and characteristics. Teabags (a staple of British culture) were felt to be the most well-known and the most regularly consumed, relative to the sparkling wine. Thus subjects would be more certain of their preferences and less vulnerable to the influence of yea-saying and starting point effects in teabags, relative to wine i.e., it is easier to formulate an OE value when familiarity is high. Subjects are more likely to be influenced by suggested bid levels if they have not previously thought about their preferences for such goods and being surer of their preferences they may be less liable to stochastic variation and error.

#### **The questions.**

By analogy with CVM, in what follows we shall label choice questions as ‘DC’ and label the questions where subjects had to fill in valuations as ‘OE’.

Each task was described by a display on a VDU screen. At the top of the screen were the words: *'If this question is selected, you will be given...'* followed by a specific endowment of money only e.g., '£6' or an endowment of a single unit quantity of one of the goods e.g., *'A bottle of wine'*. The next line of text read, *In addition to this, you will be required to accept either A or B.'*

The letters (the pairs varied) labelled alternative options where the first option described possible transfers of money, or the good, from the subject to the experimenter (*'You give us'*) or from the experimenter to the subject (*'We give you'*). The second option was fully described in both elicitation formats but the first option varied according to the format being used. For a DC question, the first option involved a pre-specified amount as one of the high or low bids. The subject was asked to select which option they preferred, e.g. for a DC WTP for wine question:

*A: You give us £3 and we give you a bottle of wine.*

*B: No Change.*

'No Change' here meant that the subject kept their original endowment, (£6 here).<sup>4</sup>

Similarly, the open-ended questioning involved two options. In the first option, the quantity of money was unspecified and in its place was an empty box. If the unspecified amount of money was a transfer of cash from subject to experimenter, the subject had to state the most they would be willing to pay such that they would prefer the first option. If the

transfer of money was experimenter to subject, the subject had to state the least amount they would receive in order to prefer the first option.

### **The incentives and the sequence of events.**

Incentives were provided by a random lottery device. If, at the end of the experiment, one of the choice questions were selected by the lottery device, then the subject received his or her choice. For questions where valuations were required, the widely used Becker de Groot Marschak (BDM) mechanism was employed. In this incentive compatible mechanism a random price is generated. If the valuation stated by the subject is less favourable to them than the generated price, then exchange occurs at the random price. If the generated price is less favourable then no trade is made. A computer-generated 'roulette-wheel' was employed to illustrate how the BDM worked.

After a brief introduction, the experimenters described the goods involved in the experiment using a script and allowed the subjects to inspect samples of the goods displayed in the laboratory. The random lottery and incentive mechanisms were then explained to the subjects. To ensure they fully understood the incentive compatibility of the BDM device, each subject was required to run through five practice questions before they proceeded to the experiment proper. In each session, half an hour was spent on instructing subjects through these practices using a familiar brand of individually wrapped biscuits as a dummy good. The first practice involved a demonstration of the DC question. For subsequent practices, involving WTP and WTA in an open-ended format, subjects were shown the BDM 'roulette wheel' after they had completed the statement. This was to clearly demonstrate what would

happen if the practice question was in fact the one to be played out 'for real'.

As a check to see if subjects were understanding the design, two multiple choice questions were asked as part of practices number 2 and 4. These questions were presented on screen after the subject had confirmed their amount in the statement, but before the BDM wheel was displayed. As an example the two options in the third practice for an equivalent gain type question were '*C: We give you ... biscuits*' and '*D: We give you £2.00*'. Suppose the subject had written 10 as their answer. The computer would then present the multiple-choice question which might read: *If the computer wrote 11 as the amount for option C, which of these outcomes would you be required to accept? a: We give you 11 biscuits. b: We give you 10 biscuits. c: We give you £2.00.* The other multiple choice question had the same format. Subjects were not given advice on how to answer the question, but if they got it wrong they were then asked to repeat the question under individual instruction.

Once subjects had completed the fifth practice they were then faced with the 18 decision tasks.

## **Parameters and subject groups.**

Table 2 summarises the treatments. Subjects were randomly divided into three groups, I, II and III. For each good (teabags, wine) and each valuation type (wta, wtp) we used two bid levels as potential anchors - high and low.<sup>5</sup> So, for instance, Group I faced four questions relevant to our study: one where they were asked their wtp for tea with no anchoring price provided and three where there was an initial DC question followed by an open ended

question on the same valuation. We can see from the table that, for each combination of good and valuation type, one group faced a DC question with the high bid level, with a follow-up OE question, a second group faced the same sequence but with a low bid level and the third group faced the OE question only. All subjects faced both valuation type for each of the two goods. So as to reduce any cross-task contamination no subject faced all the high bids or all the low bids for any single good. Furthermore, the order of related tasks was randomised so that if contamination were to occur it would not have any systematic effects on the final results.<sup>6</sup>

[Table 2 about here]

Subjects facing a WTP question were given money endowments of £6 for wine and £3 for teabags. For a WTA question, subjects were given the good to sell back to the experimenter.

## **Results.**

Overall we have data from 185 subjects, principally undergraduates from the University of East Anglia, none of whom had experience of a similar experiment. In common with many other experiments (e.g. Bateman et al 1997) we find a significant difference between mean values for WTP and WTA gathered from the no anchor subjects: for teabags mean WTP was £0.74 while mean WTA was £1.74; for wine, mean WTP was £1.82 while mean WTA was £3.79.

Table 3 summarises the main evidence from the experiment. In the column headed

DC it shows the percentages agreeing with the explicit valuation question. In the subsequent three columns we have the percentages of the subjects whose stated valuations mean that they agree *implicitly* with the valuation question. Recall that there are three such columns because there are three treatments: subjects facing a high anchor, subjects facing a low anchor and subjects facing no common anchor. As can be seen, in all cases the figure for implicit agreement is lower than that for agreement with the explicit question. Broadly speaking it also appears that the percentages for implicit agreement are the same within each valuation task.

[Table 3 about here.]

The final three columns of the table summarise the results of tests of the main hypotheses. Z1 gives the z value for a test that the proportion of subjects who agree with the explicit question is equal to the proportion of the no-anchor subjects who implicitly agree with the question. In all eight cases the difference between these two proportions is in the direction predicted by both anchoring and yea-saying. In five of the cases, this difference is statistically significant at 5% or lower significance levels (1-tailed test). Z2 then gives the z test values for a test of the hypothesis that the proportion of subjects who agree with the explicit question is equal to the proportion of the same subjects whose answers in the follow-up valuation question implies that they agree with the question. If there is yea-saying the first of these proportions should be higher, whereas with anchoring or with no anchoring, the proportions should be equal. As can be seen, in all cases the differences are in the direction predicted by yea-saying and in 5 out of 8 cases the difference is significant at the 1% level or lower. The final column reports the results of an anova test that the values of the three OE

proportions are equal. If there is anchoring then the proportions should differ, whereas with no-anchoring or with yea-saying the proportions should be equal. In only one case is the F value significant at the 5% level. In the other cases the result is not significant and in several instances the differences between the proportions are not in the directions predicted by anchoring.

Summing up, the evidence supports the notion that yea-saying rather than SPE best explains the data. To explore this further, we examine the full distribution of answers to the OE questions (Figures 2-5). For each valuation type the y axes show the cumulative percentage of values at or below the figure on the x axis, for the three OE treatments (no anchor, low anchor and high anchor). Kolmogorov-Smirnoff tests are not remotely significant for any of the differences between the distributions.

[Figure 2 here]

[Figure 3 here]

[Figure 4 here]

[Figure 5 here]

Table 4 gives the median values from the experiment, together with tests of their difference. Recall that if anchoring occurs then the impact of an anchor depends on the sign of the difference between the anchor value and the median in the absence of an anchor. When this median is higher than the anchor, the effect of the anchor should be to lower the median; conversely when the anchor is higher, the effect of the anchor should be to raise the median. Broadly speaking the differences between medians have the anticipated sign, although in two instances there is no difference in the medians and in one case (wtp for wine) the median with

the low anchor is higher than that without an anchor. The theory would predict otherwise. Moreover, in six comparisons between the no-anchor medians and the medians with an anchor none are significantly different from one another at the 5% level (1 tailed test).<sup>7</sup>

[Table 4 about here.]

We examine the consistency of responses from individuals who faced both the DC question and the OE follow-up. Let us define a *nay-sayer* as a subject who refuses a WTP (WTA) but then gives an OE value higher (lower) than the DC bid value. If the incidence of yea-saying and nay-saying is equal, then there would be no evidence to say that yea-saying is caused by anything other than random error. The results are shown in table 5, where for instance it can be seen that out of 59 individuals who agreed that they were wtp at least £1.50 for the cava, 12 subsequently gave valuations strictly below £1.50. Meanwhile, out of the 10 people who would not pay £1.50, only 1 subsequently gave a wtp value at or above £1.50. We can see that, with the exception of two of the wta formats, preference reversals were much more likely to be of the yea-saying kind rather than nay-saying.

[Table 5 here]

## **Discussion**

We find that simple models of anchoring do not explain our data well - the distributions of values for subjects who faced different anchoring treatments are remarkably similar. As a result we conclude that anchoring effects are not a significant part of the explanation here. This is in contrast to evidence of strong anchoring effects found widely in other studies (e.g. Ariely, 2003) where unfamiliar goods are involved. On the other hand it is

consistent with Frykblom and Shogren, (2000) and with the recent evidence on US consumption presented by van Soest and Hurd (2003). Partly the difference may lie in the goods involved. In our experiment and in the last two studies cited, familiar goods were the objects of valuation, whereas anchoring effects seemed to have been found most clearly when subjects were facing new or unfamiliar valuation tasks, which is often the case in environmental valuation.

Nearly all of our evidence is consistent with the yea-saying phenomenon. We get significantly higher rates of acceptance of explicit questions posed to subjects, compared to the rates of implicit acceptance computed from the valuation questions. On the other hand, psychological explanations of yea-saying are often grounded in the idea that subjects are conforming with what they perceive as the interviewer's views or seeking to please the interviewer in a face-to-face setting (Arndt and Crane, 1975). Our subjects were faced with a computer screen and, although the experimenters were in the room during the experiment, they were not closely monitoring individual responses. It is possible therefore that the results we have obtained do not necessarily reflect yea-saying as it is normally interpreted.<sup>8</sup>

Whatever the source of our results, they do not suggest that the DC format is necessarily superior to open-ended valuation questions when it comes to CVM. Open-ended questions create well-known cues and incentives for strategic bidding. On the other hand, even with familiar goods in a non-hypothetical setting our experiments shows strong evidence of yea-saying in DC questions, which must raise questions about their suitability in the field.

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Table 1: Summary of predictions.

	WTP		WTA	
	$x > v$	$v > x$	$x > v$	$v > x$
Hicksian	$P(x/v) = P(x)$	$P(x/v) = P(x)$	$R(x/v) = R(x)$	$R(x/v) = R(x)$
	$P(x) = \pi(x)$	$P(x) = \pi(x)$	$R(x) = \rho(x)$	$R(x) = \rho(x)$
Anchoring and yea-saying	$P(x) > P(x/v)$	$P(x) < P(x/v)$	$R(x) > R(x/v)$	$R(x) < R(x/v)$
	$P(x) < \pi(x)$	$P(x) < \pi(x)$	$R(x) > \rho(x)$	$R(x) > \rho(x)$
Anchoring, no yea-saying	$P(x) > P(x/v)$	$P(x) < P(x/v)$	$R(x) > R(x/v)$	$R(x) < R(x/v)$
	$P(x) = \pi(x)$	$P(x) = \pi(x)$	$R(x) = \rho(x)$	$R(x) = \rho(x)$
Yea-saying, no anchoring	$P(x/v) = P(x)$	$P(x/v) = P(x)$	$R(x) = R(x/v)$	$R(x) = R(x/v)$
	$P(x) < \pi(x)$	$P(x) < \pi(x)$	$R(x) > \rho(x)$	$R(x) > \rho(x)$

Table 2: Parameter values.			
	Group I	Group II	Group III
WTP Tea	-	£1	£2
WTA Tea	£2.50	-	£1.50
WTP Wine	£3	-	£1.50
WTA Wine	£3	£5.50	-

Table 3: Actual and Implicit Valuations (percentages accepting offer)

Valuation	DC	OE No anchor	OE Low anchor	OE High anchor	Z1	Z2	F
WTP £1, teabags	43.1	39.7	34.5	39.1	0.58	0.95	1.71
WTP £2, teabags	14.5	5.2	5.2	5.8	1.73**	1.69**	0.02
WTA £2.5, teabags	86.2	74.1	68.1	65.5	1.63*	2.60***	1.56
WTA £1.5, teabags	68.1	39.7	34.2	20.7	3.21***	3.92***	3.59**
WTP £1.50, Wine	85.5	63.7	56.5	60.3	2.84***	3.75***	0.84
WTP £3, Wine	39.7	17.2	7.2	12.1	2.68***	3.91***	1.05
WTA £5.50, Wine	91.4	85.5	89.7	83.9	2.12***	2.22***	0.55
WTA £3, Wine	60.3	47.8	39.7	37.5	1.409*	2.23***	0.77

Z1: Z test of equality of DC and OE no anchor proportions

Z2: Z test of equality of DC and corresponding anchor proportions

F: Anova test of equality of all three anchor proportions.

\*\*\* 1% level \*\* 5% level \* 10% level

Table 4: Medians of WTP and WTA for all Groups

Medians	Anchor			Median differences		
	None	Low	High	None v Low	None v. High	Low v. High
WTP for Teabags	0.55	0.625	0.65	-0.075 (0.686)	-0.10 (0.953)	-0.025 (0.226)
WTA for Teabags	1.8	1.60	2.00	0.20 (1.01)	-0.20 (1.01)	-0.40 (1.88**)
WTP for Wine	1.75	2.00	2.00	-0.25 (1.21)	-0.25 (1.19)	0
WTA for Wine	3.50	3.50	3.95	0	-0.45 (1.34)	-0.45 (1.62)

Note: Figures in parenthesis denote Mann-Whitney z value. (\*\*\*) 1% (\*\* 5% )

Table 5. The extent of yea-saying

	Yea-Saying	Nay-Saying
<b>Wine</b>		
Are you WTP £1.50?	12/59	1/10
Are you WTP £3.00?	10/23	1/35
Are you WTA £3.00?	14/35	1/23
Are you WTA £5.50?	6/56	2/2
<b>Tea</b>		
Are you WTP £1.00?	6/25	0/33
Are you WTP £2.00?	6/10	0/59
Are you WTA £1.50?	16/47	1/22
Are you WTA £2.50?	8/50	3/8

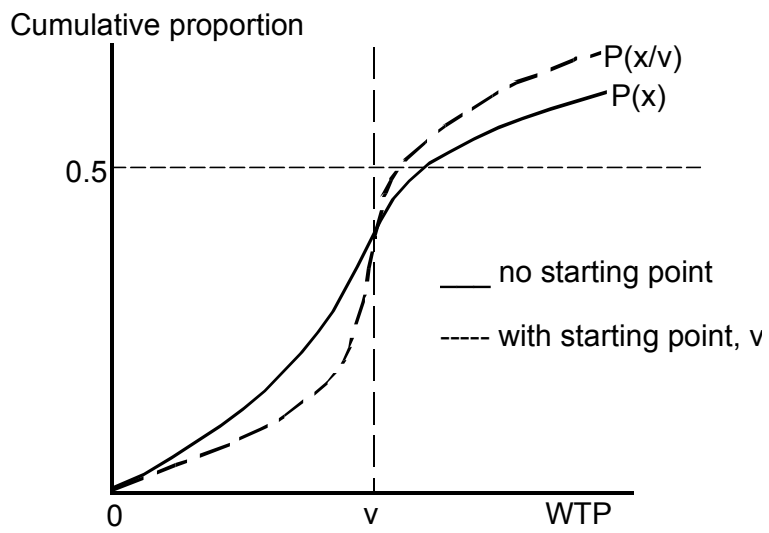


Figure 1: The effect of a starting point, with anchoring.

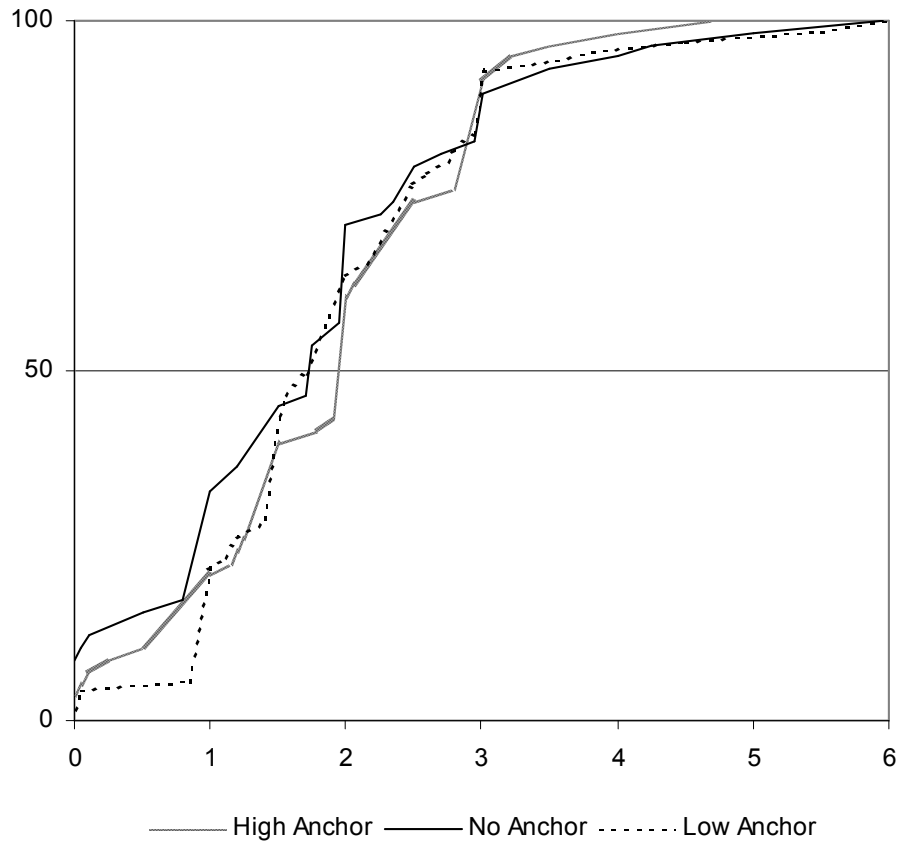


Figure 2: Cumulative valuations: WTP for wine.

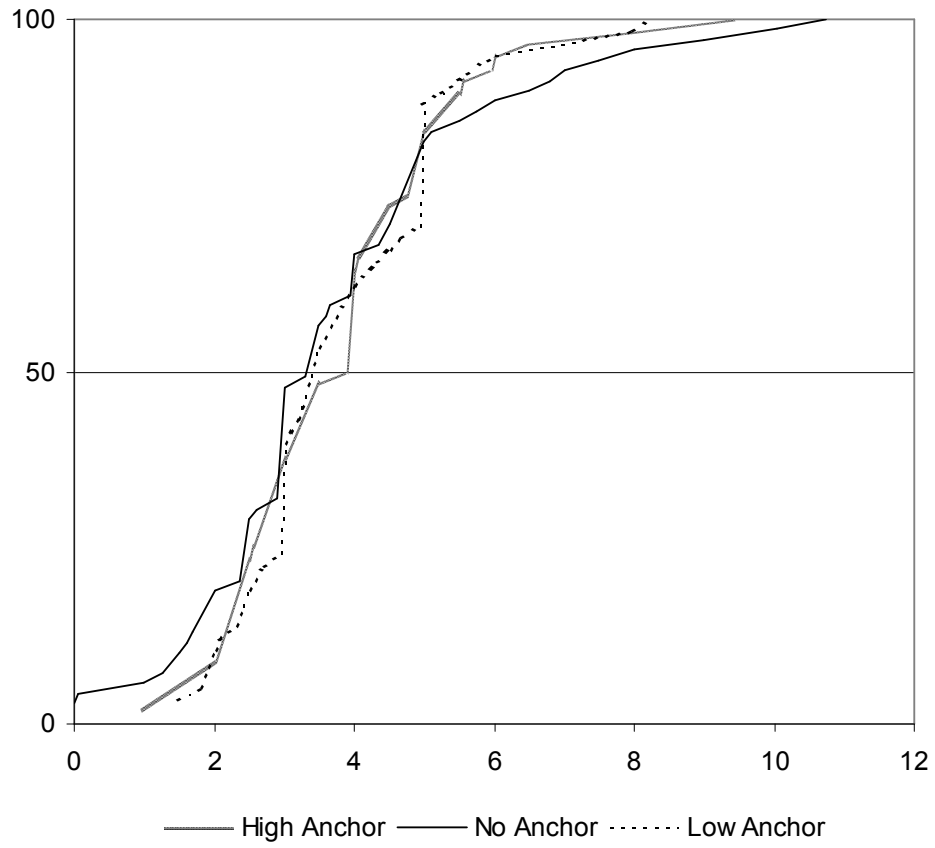


Figure 3: Cumulative valuations: WTA for wine.

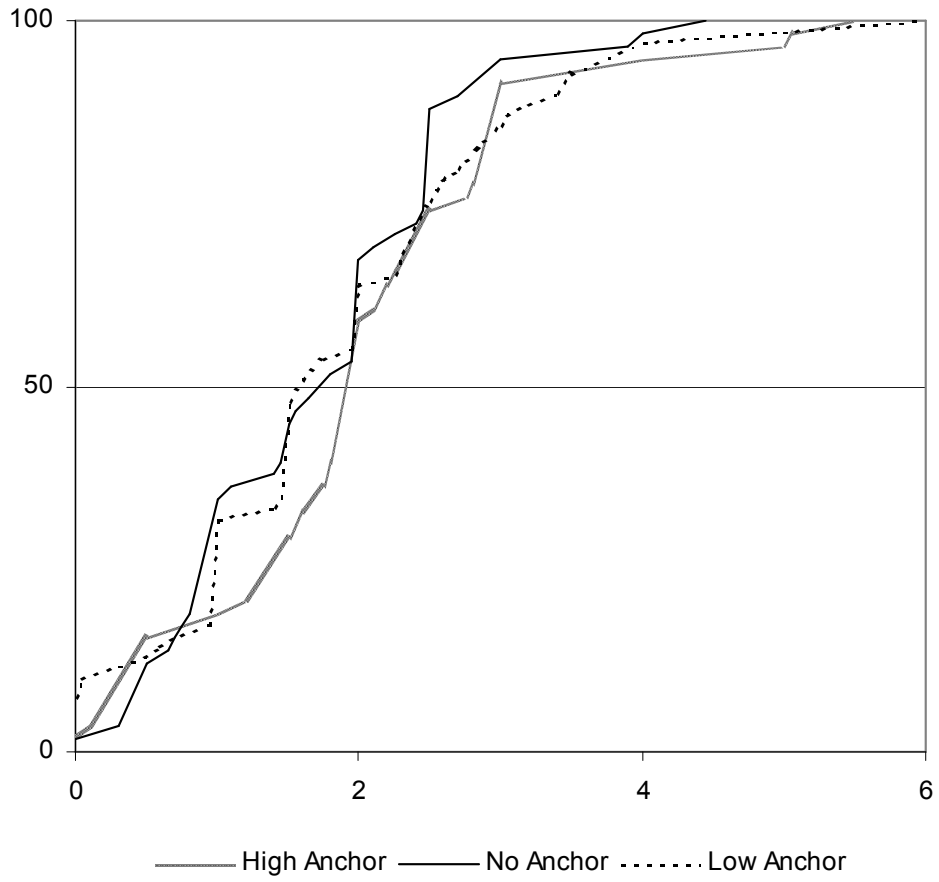


Figure 4: Cumulative valuations: WTA for teabags.

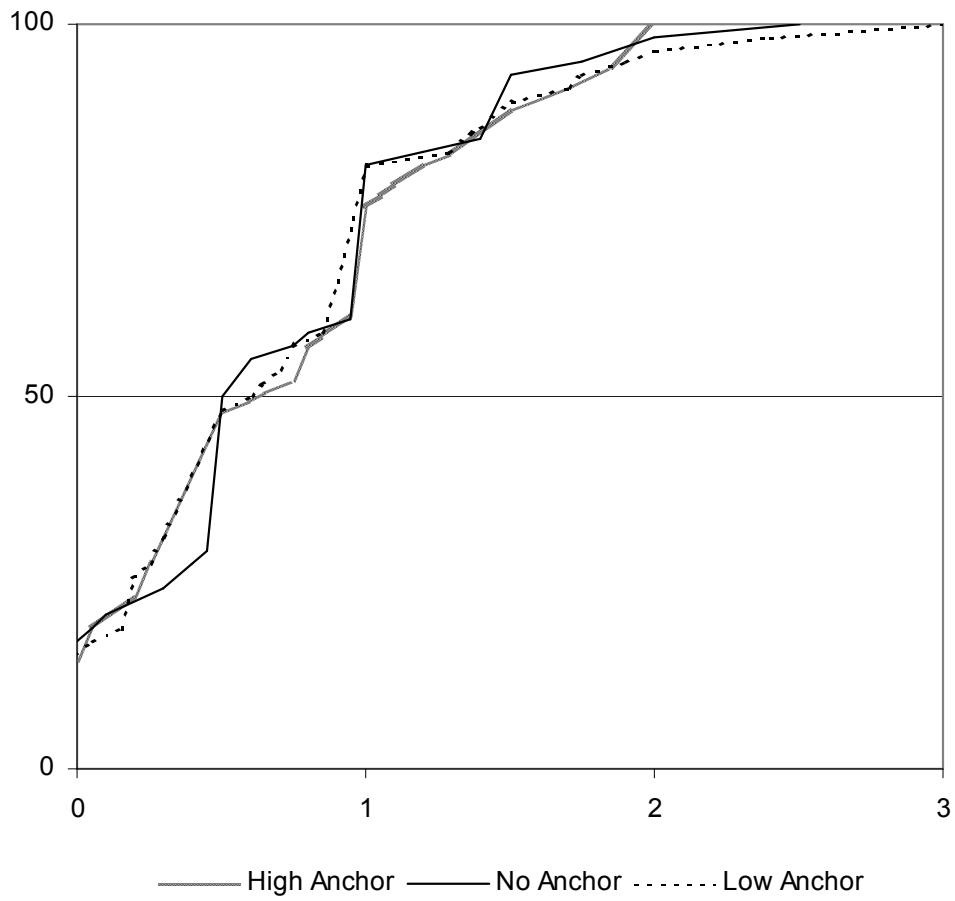


Figure 5: Cumulative valuations: WTP for teabags.

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<sup>2</sup> There may still be individual anchoring effects or self-generated anchors, depending on the history of the individual subject.

<sup>3</sup> Other parts of this experiment involved testing for reference point effects in individual valuations of chocolates and cans of coke. This reference-dependent part of the experiment is reported separately in Bateman et al (1997).

<sup>4</sup> So we interpret choosing option A as saying ‘yes’.

<sup>5</sup> A pilot study was conducted (n=52) to identify reasonable bid levels using open-ended questioning.

<sup>6</sup> But follow-up OE questions always followed on immediately after the relevant DC question.

<sup>7</sup> What is not immediately clear from the figures is the significant proportion of subjects who gave ‘round number’ valuations such as £1.50 or £2.00. In the most extreme example of this 40 out of 58 subjects gave valuations ending in .50 or .00 when asked their wta to give-up teabags. Tests based on median differences are likely to be particularly affected by the presence of such effects, but as Figures 2-5 demonstrate there is very little evidence for the anchors having a major impact on the distribution of reported values.

<sup>8</sup> We can discount the possibility that the results are due to the kinds of psychological mechanisms which underpin preference reversals (see Cubitt *et al*, 2004). To see this note the tasks in our experiment involve trade-offs between goods and money. Valuation questions

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emphasise the monetary dimension of the subject's dilemma, rather than the goods dimension. If money has a higher weighting or if it is more prominent in valuation, then we would expect wtp to be lower in valuation compared to choice. This is consistent with our evidence, but we would also expect wta to be lower in valuation, compared to choice and this is not consistent with our evidence. So it appears that are results are not consistent with standard ideas about preference reversal.