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### **Experiment Participants Offer a Commonsense Explanation for the WTA-WTP Disparity**

by

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### Abstract

In an effort to understand why people's willingness to accept compensation (WTA) regularly exceeds their willingness to pay (WTP) even when the items being traded are inexpensive market goods with ample substitutes, the verbal protocol (think aloud) technique was used in the context of a real cash experiment. The bidding produced a median WTA/WTP ratio of about 2, which is similar to that of other disparity experiments using inexpensive market goods. Subjects' statements about their bids indicate that the primary reason for the disparity was a reluctance to sell the good for much less than they thought it was worth in a sale situation. This concern with preserving the asset value of the good is a kind of loss aversion, but not the kind envisioned in the endowment effect, which emphasizes that selling creates a loss whereas buying creates a gain. Results indicate that subjects were reluctant to suffer a net loss from any transaction, whether purchase or sale. This interpretation of the role of loss aversion melds the concept with the familiar notions of gains from trade and risk aversion in the face of ambiguity. Although subjects' statements about their motivations must be viewed with caution, they do appear to offer an important hypothesis for future testing.

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## Experiment Participants Offer a Commonsense Explanation for the WTA-WTP Disparity

### Introduction

Over the past twenty years, a substantial collection of papers has documented unexpected discrepancies between willingness to pay (WTP) and willingness to accept compensation (WTA). First noticed in a contingent valuation study (Hammock and Brown 1974), the finding was later verified in real money experiments, some using inexpensive market goods. To date, more than fifteen real money experiments and ten contingent valuation surveys have found a greater WTA/WTP ratio than could reasonably be attributed solely to an income effect. Among the real money experiments, the median of the WTA/WTP ratios is about 2.5 (Brown and Gregory 1999). This consistent finding may have important implications for consumer theory, concerning the continuity of indifference curves (Kahneman et al. 1991; Knetsch 1989). However, the veracity of these implications depends on the source of the disparity, which is not well understood.

Consumer theory suggests that a WTA-WTP disparity should not occur where there is (1) no income effect, (2) no transaction cost, (3) perfect information about goods and prices, and (4) a market that engenders truthful revelation of preferences. These conditions, however, were largely met in some of the experiments that found the disparity, as they used inexpensive market goods with ample, readily available substitutes and obtained real cash bids using a random price or second price auction.

Several studies, suspecting a lack of truthful preference revelation in prior WTA-WTP bidding experiments, have used iterations of a multi-participant auction to see if repeated market experience would move WTA and WTP closer together.<sup>1</sup> The most recent of these studies, by Shogren et al. (1994), is particularly relevant here because it used an inexpensive market good (a candy bar). Iterations of this study's second-price sealed-bid auction did move WTA and WTP

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<sup>1</sup> Coursey et al. (1987) used iterations of a fifth-price sealed-bid auction to obtain bids for a private good (actually a "bad," the drinking of a foul tasting liquid). WTA declined with iterations, but even the last iteration exhibited a WTA/WTP ratio of 1.6. Brookshire and Coursey (1987) used iterations of a Smith auction to obtain bids for a quasi-public good (tree density in a local park). Over iterations the ratio declined markedly, but was still 2.4 in the last iteration. Concerns were raised about data analysis and about unintended bidding behavior engendered by iterative use of the auctions (Gregory and Furby 1987).

closer together, but by the third iteration WTA was *below* WTP, although by a small amount. This counter-intuitive, negative WTA-WTP disparity became slightly larger in subsequent iterations, raising doubts about repetitive use of a second-price auction and thus failing to settle the issue.

That WTA has exceeded WTP for some goods used in past experiments and contingent valuation surveys is not surprising. Some of the goods were relatively valuable and unique, such as hunting permits for desired species, allowing for an income effect.<sup>2</sup> Other goods raised questions of transaction legitimacy, where accepting money to allow a loss may seem unethical, thereby elevating respondents' WTA, such as in the sale of safety or health (Viscusi et al. 1987). Others may have raised concerns of moral responsibility for the welfare of goods in one's care (Boyce et al. 1992). Still others, because of poorly defined values or poorly understood characteristics of the goods, may have led risk averse bidders to hedge in their bids to avoid a potential loss (Dubourg et al. 1994; Kolstad and Buzman 1999).<sup>3</sup> However, none of these reasons for the disparity apply to the inexpensive market goods with ample substitutes, such as coffee mugs and candy bars, that have been used in other, real money experiments demonstrating a WTA-WTP disparity.<sup>4</sup>

The endowment effect (Thaler 1980) and its essential ingredient loss aversion (Kahneman and Tversky 1979) have been proposed to fill this explanatory void (and also as a partial explanation for disparities found for other classes of goods). With loss aversion, a loss is inherently more significant to people than a formally equivalent gain. Given this tendency, and assuming that selling creates a loss whereas purchase creates a gain, WTA will naturally exceed WTP (Kahneman et al. 1990; Knetsch and Sinden 1984).

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<sup>2</sup> Two examples from real money experiments are the deer hunting permit used by Bishop et al. (1988), which had mean buying and selling prices of \$31 and \$153, respectively; and the bison hunting permit used by Boyce and McCollum (1993), which had mean buying and selling prices of \$215 and \$12,233, respectively. See Hanemann (1991) on the possibilities of a disparity for valuable and unique goods.

<sup>3</sup> Goods likely to be subject to ambiguity about values or characteristics that have been used in WTA-WTP disparity studies include environmental goods, such as air visibility (Rowe et al. 1980) and industrial plant odor (MacDonald and Bowker 1994), and risky goods such as lottery tickets (e.g., Eisenberger and Weber 1995; Kachelmeier and Shehata 1992; Knetsch and Sinden 1984).

<sup>4</sup> These goods, and the WTA/WTP ratios the experiments produced, include: a mug, ratio = 2.6 (Kahneman et al. 1990); a houseplant, ratio 1.7 (Boyce et al. 1992); a candy bar, ratio = 1.3 in the first iteration (Shogren et al. 1994); a mug, ratio = 2.4 (Franciosi et al. 1994); and a mug, ratio = 2.2 (Morrison 1997).

Kahneman and Tversky (1979) formalized the loss aversion claim in *prospect theory*, which postulates an asymmetric value function: steeper for losses than for gains and convex for losses but concave for gains, with a kink at the current endowment quantity. Under this theory, a person's current situation is a critical reference point from which changes are evaluated differently depending on whether they are gains or losses. Although proposed principally for risky prospects with associated probabilities, Kahneman and Tversky (1979) added that the theory could be “extended to the typical situation of choice, where the probabilities of outcomes are not explicitly given” (p. 288).

Thaler (1980) was the first to suggest that loss aversion was the root cause of the WTA-WTP disparity. He proposed the endowment effect as a term to describe the notion that goods are considered to be more valuable when they are part of a person's endowment than when not in the endowment, all else equal. He then tied the endowment effect to Kahneman and Tversky's (1979) proposition of asymmetric treatment of gains and losses in stating that the endowment effect occurs “because removing a good from the endowment creates a loss while adding the same good (to an endowment without it) generates a gain” (p. 44). Importantly, Thaler not only accepted loss aversion as a viable theory of human behavior, but also claimed that selling creates a loss and buying generates a gain—thus associating loss aversion with the good, but not the net result, of the transaction. Several subsequent papers supported the endowment effect as an explanation of their experimental results, which all showed a substantial WTA-WTP disparity (e.g., Gregory 1986; Kahneman et al. 1990; Knetsch 1990; Knetsch and Sinden 1984). The essence of the endowment effect explanation is that, as Kahneman et al. (1990) state, there is “a genuine effect of reference positions on *preferences*” (p. 1326); “the *value* that an individual assigns to such objects as mugs ... and chocolate bars appears to increase substantially as soon as the individual is given the object” (p. 1342) (emphasis added). The experimental findings of WTA-WTP disparity experiments led Tversky and Kahneman (1991) to describe “an endowment effect which is produced, *apparently instantaneously*, by giving an individual property rights over a consumption good” (p. 1041-1042) (emphasis added).

This paper examines these and other possible reasons for the WTA-WTP disparity found in experiments using inexpensive market goods. Unlike previous studies, which observed the disparity and then theorized about its causes, the approach used here essentially asked the subjects to say why they bid as they did. In the context of a real money experiment using

familiar, inexpensive goods, subjects were first asked to “think aloud” as they decided on their buying and selling prices, and then asked to explain any discrepancies between their prices.<sup>5</sup> Subjects’ verbalizations did suggest many of the explanations that authors of past studies have proposed for the disparity. It is the frequencies with which the various explanations were suggested that provide new insights into the reason the WTA-WTP disparity occurs in experiments using inexpensive market goods.

### **Plausible Reasons for the Disparity**

Analysis of data produced by the “think aloud” or verbal protocol technique (Ericsson and Simon 1984) is facilitated by specifying, prior to data collection, the concepts that subjects’ verbalizations might imply. The following five concepts are suggested by theory and past experimentation as plausible reasons for a disparity with inexpensive market goods.

*Income effect.* When the goods at issue are inexpensive market goods with ample perfect substitutes, an income effect (i.e., a sufficiently large income elasticity of demand) is not expected. However, for the subjects in this experiment, who were students responding to an announcement offering a participation fee, purchase of such goods may have represented a significant outlay, leading to an especially constrained WTP. A possible statement suggesting this reason would be “I’m short of cash right now, so I can’t afford to pay much for it.”

*Transaction cost.* Transaction costs are those incurred to make a purchase or sale possible, such as locating a good and traveling to where it can be exchanged. A subject might elevate a selling price in order to cover the transaction cost of purchasing a substitute. A possible statement suggesting this reason would be “If I sold this at its store price, I would have to travel to the store to buy another one, so I’ll add the cost of that effort to my selling price.”

*Ambiguity.* Risk-averse subjects can be expected to lower WTP or raise WTA to the extent that they lack relevant information, such as about the item’s store price or about their own preferences, in order to avoid making a decision they will later regret. Possible statements suggesting this reason would be “I’m not sure what these sell for at the book store” and “I don’t know whether I’d use this if I had it.”

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<sup>5</sup> A previous use of the verbal protocol method in economic valuation, and the inspiration for the current application, is Schkade and Payne’s (1994) analysis of contingent valuation.

*Seeking a good deal.* A buyer focused on getting a good deal would tend to state a low price, whereas a seller focused on getting a good deal would tend to state a price as high as what an interested buyer would pay. A possible statement suggesting this reason for a buyer would be “I would only buy this if I got a good deal on it” and for a seller would be “If someone wanted this they would expect to pay at least \$5.”

*Endowment effect.* If the pain of loss outweighs the pleasure of gain, and if selling creates a loss but buying creates a gain, then WTA to give up a good will exceed WTP to obtain it. Statements possibly indicating the endowment effect for goods would be “Once I have something, it’s more valuable, cause it’s mine” and “I have a hard time giving things up.”

### Methods

Subjects were recruited individually at the student union and paid \$7 to participate in an experiment that took about 20 minutes and was recorded on audio tape. During the experiment, subjects were asked to state the prices at which they would be willing to buy three different goods, and the prices at which they would be willing to sell the same the goods assuming that they already owned them.<sup>6</sup> They were told that one of these six transactions would later be randomly selected as binding, and that their stated price for that transaction would be compared with a randomly selected price to determine the outcome. The experiment had the following 5 steps:

1. Procedure is explained to the subject.
2. Subject practices procedure with two goods.
3. Subject states WTA and WTP bids for three other goods (six bids in all).
4. Subject explains cases of  $WTA \neq WTP$ .
5. One of the six bids is randomly selected as binding, a price is drawn, and (depending on the stated and drawn prices) purchase or sale may be completed.

To help subjects understand the auction, the experimenter described the procedure and then asked subjects to read instructions reiterating the main points. The instructions emphasized that bids should be relevant to the binding transaction that would result at the end of the

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<sup>6</sup> Franciosi et al. (1994) were concerned that using terms like “buy” and “sell” might accentuate a disparity, and carefully avoided such terms in their WTA-WTP disparity experiments, but still found a significant disparity. For this reason, these terms, which seem to most directly convey the notions of WTP and WTA to subjects, were not avoided in the current experiment.

experiment, rather than to some other circumstance in which subjects might imagine themselves. The subjects were also given a sheet listing the 25 possible drawn prices. The written instructions given to subjects are found in Appendix A.

Subjects were instructed to verbalize their thoughts as they decided on their bids. When the bids were requested, subjects were reminded to verbalize their thoughts if they were silent for 4 seconds. If subjects stated a price without verbalizing any other thoughts, they were immediately asked to explain why they chose that amount.

After the instructions were delivered and any questions about them were answered, subjects practiced the procedure with two goods. They were asked for a WTP for a pen and a WTA for a poster. After each practice bid, the subject drew a price from among the 25 possible prices in a box, and the drawn price was compared with their stated price to determine what the outcome would have been if the transaction had been the binding one.

The six bids of interest were then obtained, a WTP and a WTA for each of three goods: a large chocolate bar, a university mug, and a bound notebook of blank pages suitable for taking class notes or keeping a journal. The order in which the six bids were elicited was randomly determined for each subject by drawing marked (from “1” to “6”) ping-pong balls from a box, where each number indicated a certain transaction (such as “WTP for the mug”). For each bid, the experimenter handed the item to the subject.

After the six bids were obtained, subjects were asked to explain any discrepancies between their buying and selling bids for a given good. So as to not prejudice their bids, subjects were not informed beforehand that they would be asked about discrepancies.

The subjects then drew a ball to determine which transaction was binding, and drew a price from among the 25 prices.<sup>7</sup> In keeping with the random price auction (Becker et al. 1964), it was explained in step 1 that, in the purchase situation, if the stated price was greater than or equal to the drawn price, the individual would purchase the good at the drawn price; and in the sale situation, if the stated price was less than or equal to the drawn price, the individual would sell the good at the drawn price. A random price auction was used in this experiment because it has been common in other WTA-WTP disparity experiments and because it can be used with only one individual.

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<sup>7</sup> The 25 prices ranged from 5¢ to \$10. Except for 5¢ replacing 0, the prices were in steps of 25¢ up to \$2 and in steps of 50¢ from \$2 to \$10.

Analysis began with transcribing the audio tapes of the experiment and then reading them carefully in search of additional concepts not already articulated based on theory that help interpret a WTP, WTA, or explanation of a difference between these two measures. Statements that did not necessarily aid in understanding the disparity but did help explain an individual WTA or WTP were also included, such as statements about the usefulness or characteristics of a good. In all, 24 categories of statements were originally defined, which were later combined into the 15 presented here.<sup>8</sup> Using the transcripts, three people separately coded incidence of the defined concepts, after which differences among the three codings were reconciled. Finally, using the reconciled record, frequencies of kinds of statements were compiled for each of the six bids and for each of the three possible discrepancies.

The verbal protocol method is expected to work best when subjects must ponder the question they were asked before they can articulate an answer. Svenson (1989) suggests that this condition is more likely when the task is at least somewhat unfamiliar or complex. This requirement was not, it must be noted, fully met in the current study, at least in stating WTP. Probably because the goods used in the experiment were familiar to the subjects, they tended to quickly arrive at their bids, and the experimenter often had to then prompt subjects to verbalize their reasons for their bids. Thus, to some extent the verbalizations were retrospective, rather than concurrent protocols, though only by a few seconds. Ericsson and Simon (1984) caution that retrospective protocols may not be as accurate as concurrent ones because subjects may quickly lose thoughts held in short term or working memory. There is also the possibility that subjects may make up responses they think will rationalize their prior statements. With these worries in mind, the responses obtained concurrently were compared with those obtained immediately after the bids were stated. No differences were found between the two sets of statements, and they are presented together herein.

## Results

Twenty-four subjects completed the experiment, but three did not sufficiently understand the instructions or cooperate with the “think aloud” request, and thus were removed from the sample, leaving 21 subjects. This sample of subjects is too small to support robust statistical

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<sup>8</sup> For example, three categories regarding ambiguity (about market price, about one’s own values, and about the values of others such as potential buyers) were combined into the category “ambiguity about price or value”.

tests, but is sufficient to explore subjects' motives for, and offer new insights about, their bidding behavior.

## Bids

Subjects' bids were similar to those of other disparity experiments, with median WTA being roughly twice median WTP (Table 1). Over two-thirds of the subjects stated greater WTA than WTP bids.<sup>9</sup> The median of the individual WTA/WTP ratios ranged from 1.7 for the mug to 2.5 for the notebook. It is notable that most subjects not only produced their own individual WTA-WTP disparity, but they also, when asked to explain differences between their buying and selling bids, had little trouble in doing so (not, apparently, considering a difference as out of the ordinary).

Because subjects provided their WTA and WTP bids before knowing which transaction would be selected as binding, they were providing bids for alternative future conditions. This left open the possibility that subjects would react differently from those of earlier split-sample experiments where each subject provided only one type of bid for one good. We cannot know for sure whether the unusual procedure of this experiment caused respondents to react differently from those in the earlier experiments, but the similarity of the resultant median WTA/WTP ratio (of about 2) to ratios obtained in earlier experiments at least does not suggest a difference.

There was no obvious relationship between subjects' WTP bids and their WTA-WTP differences. For example, consider bids for the mug (Figure 1), where points along the straight

Table 1. Bids for Three Goods

	Chocolate	Mug	Notebook
Median			
WTP (\$)	0.50	2.00	1.00
WTA (\$)	1.50	3.50	2.00
WTA/WTP	2.0	1.7	2.5
Number of subjects			
WTP = WTA	5	6	1
WTP > WTA	0	1	2
WTA > WTP	16	14	18
Total	21	21	21
Approximate retail price (\$)	1.75	6.00	4.00

<sup>9</sup> Two other studies that obtained both WTA and WTP from each subject are Kachelmeier and Shehata (1992) and Eisenberger and Weber (1995). Both studies also found a significant disparity (for lottery tickets).

line indicate cases of  $WTP = WTA$ . In general, the bids show little agreement about WTA or WTP, but considerable agreement that WTA exceeds WTP.

**Statements**

Table 2 reports the frequencies with which subjects made statements conforming to each of the 15 statement categories. The “WTP” and “WTA” columns report the frequencies with which the categories were mentioned during the articulation of a WTP or WTA amount, and the “Explanation” column reports the frequencies with which the categories were mentioned when subjects were explaining a difference between their prior WTA and WTP bids. The “Any time” column gives the frequencies with which the categories were

Figure 1. Bids for the Mug

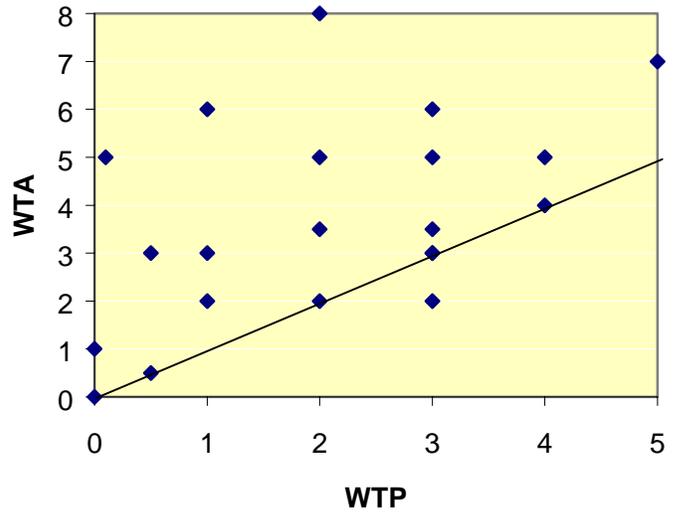


Table 2. Number of Subjects Indicating a Statement Category With at Least One Good (statement categories in order from most to least common)

Statement category	WTP	WTA	Explanation	Any time*
1. Personal utility or disutility of item	21	17	15	21
2. Item quality and characteristics	20	19	3	21
3. What it costs at the store	16	16	4	20
4. What it's worth to others; make a profit	0	17	20	20
5. Get a "bargain"; spend a trivial amount	11	0	2	11
6. Reasonable or compromise price	5	7	5	10
7. Ambiguity about price or value	5	7	3	10
8. Gift potential	5	6	1	9
9. Facilitating a sale	0	8	1	9
10. Opportunity cost	2	5	2	6
11. Lack of funds (income constraint)	4	0	2	4
12. Loss aversion	1	0	3	3
13. Replacement cost (\$ to buy another)	0	2	0	2
14. Transaction cost	0	1	1	2
15. Cost to manufacture	1	0	0	1

\* Subject made such a statement in response to a WTP, WTA, or explanation question.

used by a subject regardless of the kind of question they were answering. For a subject to be counted in the frequency computation, a given statement category needed to be used with only one of the three goods. Thus, for example, 20 subjects (line 2 of the table) mentioned the quality or characteristics of at least one of the items in articulating a WTP amount, 19 subjects made a similar statement when articulating a WTA for at least one item, three subjects made such a statement when explaining a difference between their WTA and WTP bids for at least one item, and all 21 subjects mentioned item quality or characteristics at least once. The categories are listed in order of frequency “any time.”

In addition to statements indicating the five reasons for the disparity listed above (which are discussed in subsequent paragraphs), subjects made the following nine other types of statements that, while not necessarily helping to explain a disparity, did help explain a given WTP or WTA (all statements quoted below were taken from the transcripts):

1. All 21 subjects (Table 2, line 1) made statements indicating the personal utility of the item (e.g., “I like this mug”; “I don’t need a notebook”).
2. All subjects (line 2) also described characteristics of the items (e.g., “It [the notebook] doesn’t have lines”; “It’s a fairly large candy bar”).
3. Twenty subjects (line 3) mentioned the item’s store price or its “worth” (e.g., “The typical price for that mug is about \$5”; “It’s worth \$2, but I don’t want it”).
4. Ten subjects (line 6) settled on a “reasonable” or “fair” price, (e.g., “I’d spend 50¢ on it because it seems like a reasonable price”; “\$3 sounds reasonable to sell it”), which was typically a bid below the item’s assumed store price.
5. Nine subjects (line 8) mentioned the possibility of making a gift of the item (e.g., “I don’t...have very much use for that...maybe as a present or something”, “I know if I don’t like chocolate, I like giving it away...and I would get enjoyment from that”).
6. Nine subjects (line 9) justified a low WTA as a way of increasing the likelihood of selling the item (e.g., “To get it off my hands, I’d let it go for \$1”).
7. Six subjects (line 10) indicated awareness of opportunity costs (e.g., “I’d pay 25¢...with 50¢ I could buy something else like a pop”).
8. Two subjects (line 13) chose a WTA that they thought would cover the cost of replacing the item (e.g., “I would sell it for \$6...with \$6 I could go and buy another one”).

9. One subject (line 15) mentioned the cost to manufacture the item (“I don’t think it costs that much to make one”).

Additional selections from the transcripts depicting each of the 15 categories of statements are listed in Appendix B.

Table 3 is taken from the rows of Table 2 that refer to the five plausible reasons for the disparity listed in an earlier section. The first row of Table 3 combines rows 4 and 5 of Table 2, which capture the WTA and WTP parts of “seeking a good deal”—the most prominent of the five reasons, having been mentioned in some form by all 21 subjects. Eleven subjects, in estimating a WTP, mentioned getting a bargain (e.g., “I’d pay \$1—it’s probably a lot more in the bookstore, so a bargain”), getting a good deal (e.g., “Well, to buy chocolate, it would have to be a good deal”), or spending only a trivial amount (e.g., “I’d say 10¢ for the notebook because 10¢ doesn’t mean anything to me”). And twenty subjects, in estimating a WTA, suggested that they were thinking about what they could get for the item in a sale situation. This notion had the following three forms: (1) what someone else would spend for the item (e.g., “My thoughts are, what do I think I can get for the notebook”; “A lot of people will buy sweets over anything else”), (2) the item’s utility to others (e.g., “I don’t need it that much, but I have friends who like to write in such notebooks”), or (3) making a profit (e.g., “I wouldn’t pay a lot to buy it, but to sell it I would probably to higher...I would try to make a profit from it”).

Twenty subjects included the “seeking a good deal” concept in their explanations of WTA-WTP differences, as indicated by the following three examples: (1) “If I were in the market for a notebook, I would probably pay three dollars for it, but since I’m not I won’t pay that much” (stated in explaining a WTA of \$3 versus a WTP of \$1). (2) “I grew up with ‘buy low, sell high’. I know that people charge more for things than they are worth. But in buying, I know

Table 3. Number of Subjects Indicating a Reason for a Disparity for at Least One Good (reasons in order from most to least prevalent)

Reason	WTP	WTA	Explanation	Any time
Seeking a good deal	11	17	20	21
Ambiguity	5	7	3	10
Income constraint	4	0	2	4
Loss aversion	1	0	3	3
Transaction cost	0	1	1	2

that I really don't need it, so I'm not really motivated to spend what I think is a fair selling price.”

(3) “I wouldn't normally buy something unless I felt really compelled to buy it, such as when it's a really cheap price, but if I have something I wouldn't mind selling it if I can get more than it's worth to me.” See Appendix B for other statements.

Ten subjects suggested ambiguity, or at least lack of certainty, about price or value at some time during the experiment (e.g., “There's a big range [in store price]—like coffee mugs can be expensive”; “I have no need for something like this that I can think of at this point, but that doesn't mean something couldn't arise”). Any indication of lack of certainty was accepted, such as “I guess normal candy bars cost about close to \$1.” No subjects suggested risk aversion (with statements such as “I'd hate to pay too much for it” or “I'd regret it if I sold this too cheaply”), so in listing incidence of ambiguity as an observed reason for the disparity we are assuming the subjects were risk averse.

Four subjects mentioned an income constraint (e.g., “I'm totally broke”) and two subjects mentioned transaction cost (e.g., “I'd want to make a little bit extra for my time trying to sell it”).

In looking for statements indicating loss aversion, any indication of sensitivity to loss or of an increase in value with ownership was accepted as a possible expression of the concept, but only three subjects made such statements. Perhaps the clearest indication of loss aversion was the following explanation of a disparity: “When I had it, I wouldn't be willing to part with it as easily, cause I like it, and it would take a lot for someone to take it from me, whereas if someone just showed me this mug and said do you want to buy it, I could pick out of a whole bunch of other mugs and might not want this one.” All four loss aversion statements (made by the three subjects) are listed in Appendix B.

As reported above, many subjects mentioned the item's store price in the course of articulating one or more of their WTP or WTA bids. Some stayed with that price as their bid and others stated a bid lower than their estimate of store price (for some others, who mentioned the existence of store price but did not state their estimate of that price, it was not clear whether they adjusted downward or not). Examples of the two behaviors (staying with store price and bidding below store price) for WTP and WTA bids follow: (1) “I would say \$1.50...it's about the average price you would pay at a grocery store” (WTP = store price); (2) “I kinda like the mug...I'd probably go around \$5, since...that's a typical price” (WTA = store price); (3) “I'm thinking of them as being \$2.50...in a store...but I have a lot of mugs at home...I'd pay \$1 for

it” (WTP < store price); and (4) “I’d say 50¢...that’s even cheaper than the going price and I don’t really care about it” (WTA < store price). These behaviors suggest that store price may have served as a starting point in forming a bid. Using a starting point and then perhaps adjusting from that point based on additional information is an acknowledged strategy for tasks such as estimating monetary values.<sup>10</sup> For example, Lichtenstein and Slovic (1971) suggested that subjects who were asked for their WTP for gambles tended to use the payoff amount as a starting point and then adjust downward based on the probability of winning.<sup>11</sup>

### Discussion

In spite of (1) the real-money incentive inherent in the binding transaction, (2) the admonition to state “the minimum amount you would accept to sell each item here and now” rather than “in some other circumstance” (Appendix A), and (3) the knowledge that the auction price would be determined by randomly drawing a price from among 25 possible prices, most subjects still mentioned the item’s value to others, or the opportunity for making a profit, in the course of both articulating their WTA and justifying a disparity (Table 2, line 4). Although a few subjects were obviously cognizant of the opportunity cost of failing to sell the item (Table 2, line 10), most indicated they were primarily concerned with not giving up the item for less than some meaningful portion of what it was worth in a sale situation, and many of these same subjects mentioned their willingness to purchase the good only if they got it for a low price. Overall, most subjects seemed primarily concerned with getting a good deal (or, conversely, with not getting a bad deal) in the transaction, and many appeared to use store price as a starting point in arriving at their bid.

The effect of “seeking a good deal” on the disparity could be enhanced by the second most frequently indicated explanation, that of ambiguity. If we assume risk aversion in the face of ambiguity about prices or value, subjects would tend to lower WTP and raise WTA to assure they got the good deal they sought.

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<sup>10</sup> This strategy is often called “anchoring and adjustment” (e.g., Schkade and Johnson 1989).

<sup>11</sup> Because many of their subjects bid more than the expected value of the gambles, Lichtenstein and Slovic (1971) suggested that subjects’ adjustments were insufficient. One might hypothesize for the current study that WTA exceeded WTP because of an insufficient adjustment in WTA bids, but that hypothesis simply begs the question why the adjustment was greater for WTP than for WTA.

Additional support for the “seeking a good deal” explanation is perhaps contained in the finding of induced value experiments (e.g., Franciosi et al. 1994; Kahneman et al. 1990) that the disparity does not apply to money traded in a riskless environment.<sup>12</sup> A critical difference between goods and money in non-risky trades is that the value of money is apparent to everyone. This transparency preempts the opportunity to profit or to take advantage of the greater value that others may place on the good. If removing the opportunity to profit precludes the disparity, then the disparity observed for inexpensive market goods may be due to the opportunity to profit that exists when such goods are traded among people with different tastes and incomes.

Seeking a good deal is not necessarily a greedy attempt to gain at someone else's expense or even a habitual resort to bargaining strategy; rather, it may be an attempt to avoid losing the market value that the good represents. In stating a selling price, some subjects focused not on what the good was worth to themselves but rather on what it was worth to potential buyers. For these subjects, a request for WTA may simply call for estimating a reasonable selling price, which is the highest price at which the good would tend to sell. Subjects' statements suggest that, for some people, that price *is* the good's worth in a sale situation.<sup>13</sup>

A related reason that owners may refuse to sell a good at a price as low as their own WTP is that they can always give the good away (Table 2, line 8) as a gift that may be worth as much to the recipient as the good's market price.

Maintaining a WTA twice WTP seems irrational unless purchase at WTA was possible. In fact, over half of the 25 prices that could have been drawn for the binding transaction were above the median WTA bids for the three goods, so the chances of selling the good at the stated bids were substantial. One might presume that additional experience with the random price auction would have led subjects to lower their WTA bids, but evidence from past disparity

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<sup>12</sup> Kachelmeier and Shehata (1992) offer additional evidence, at least for WTA. They found that the ratio of WTA to expected value for lottery tickets dropped to 1.0 as the probability of winning rose to about 0.3 for large payoffs and 0.8 for small payoffs. Tversky and Kahneman (1991) also concluded, based on the “chooser” experiment of Kahneman et al. (1990), that loss aversion applied to goods but not to money, stating in reference to the experiments: “the buyers in these markets do not appear to value the money they give up in a transaction as a loss” (p. 1055).

<sup>13</sup> Evidence for this explanation is offered by Hof et al. (1989), who questioned separate samples of federal livestock grazing lessees about their WTP or WTA for such leases. WTP estimates were clustered around the federal grazing lease rate of about \$1.50 per animal-unit-month, whereas WTA estimates were clustered around the private grazing lease rate of about \$7.50 per animal-unit-month. That is, WTP respondents were “inclined to respond near the lowest credible bid,” and WTA respondents “apparently felt constrained by the highest available price for this sort of commodity” (p. 3).

experiments using iterations of a random price auction (e.g., Boyce et al. 1992; Kahneman et al. 1990) indicates that such experience does not affect bids—a not unexpected finding in light of the fact that the set of possible prices remained constant throughout the iterations.

Perhaps the most surprising finding of this study is that there was not more evidence of the endowment effect. Only three subjects suggested the endowment effect, and some of their statements (Appendix B) were only vaguely related to the concept. The lack of evidence for the endowment effect, in light of the intuitive appeal of the loss aversion notion, leads one to wonder whether this implementation of the verbal protocol method simply failed to detect the concept. It is possible that most subjects were unaware of the true nature of their preferences, or that the procedure of asking for WTA bids without first giving the item to the subjects lessened the sense of loss. I would argue, however, that loss aversion was indeed present, but not in the form characterized by the endowment effect. The endowment effect relies on the idea that buying creates a gain whereas selling creates a loss, which focuses on the good rather than on the net result of the transaction. The aversion suggested by most subjects' WTA statements, however, was not to losing the good, but to losing the asset value inherent in the good. And on the WTP side, the aversion was to paying more than the good was worth to them. Subjects were, to put it simply, averse to incurring the net loss that results from paying too much or selling too cheaply. If loss aversion is separated from the good per se, and instead refers to the aversion to a net loss, loss aversion may certainly play a role in the disparity.<sup>14</sup> However, that role is seemingly indistinguishable from seeking a good deal or from risk aversion in the presence of ambiguity.

The endowment effect argues for a change in preference upon a change in endowment, leading to a change in value for the good. But loss aversion—the notion that losses are weighted more than objectively commensurate gains—does not require a change in preference for the good once it becomes part of an individual's endowment. If the loss is of asset value, rather than of the good per se, then no change in preference is needed for loss aversion to cause or enhance a disparity. Indeed, avoidance of a net loss is essentially the flip side of “seeking a good deal.”

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<sup>14</sup> As is well known, in selling, if subjects are most concerned with the net result of the transaction, they gain by getting more for the good than it is worth to them and lose by getting less; thus, both the pursuit of gain and the avoidance of loss lead the subjects to state a price above what the good is worth to them. And in buying, if subjects are most concerned with the net result of the transaction, they gain by paying less than the good is worth to them and lose by paying more; thus, both motivations lead subjects to state a price below what the good is worth to them.

This reasoning suggests a new interpretation of the interesting results presented by Kahneman et al. (1990) in their “chooser” experiment. They compared potential sellers’ WTA bids and potential buyers’ WTP bids, each elicited with a random price auction, with the valuations of a third group of subjects who chose between the good (a mug) and various sums of money. The results were that the buyers and sellers exhibited the typical WTA-WTP disparity, and that the choosers valued the mug only slightly more than did the buyers. Interpreting this result, Tversky and Kahneman (1991) argued that because the choosers and sellers faced the same decision problem (each could have the mug or money without incurring a monetary loss) but produced very different values, placing the mug in the sellers’ endowment allowed loss aversion to increase the mug’s value. An alternative interpretation is that it was the choosers and buyers who faced the same decision problem (each deciding how much money they would give up to get the mug), whereas the sellers were indicating how much they should receive in return for the mug.

### **Conclusions**

As in previous experiments using inexpensive market goods, WTA was roughly twice WTP. The most commonly indicated reason for the disparity was that subjects based WTP on what the good was worth to them personally and WTA on what the good was worth in a sale situation. That is, in deciding on WTA, most subjects referred to what the good would be worth to others, and often appeared to rely on store price as a starting point.

The results do not contradict loss aversion in general—nothing in the results suggests that a loss does not have greater subjective effect than an equivalent gain—but there was little direct evidence of loss aversion as it is characterized in the endowment effect. Few subjects suggested an aversion to losing the good itself or a greater attachment to the good in a WTA than in a WTP situation. Apparently, the good did not suddenly become more precious when owned; thus, there was little evidence of the “instant” endowment effect that seemed to puzzle Tversky and Kahneman (1991) (see the quote in the Introduction). Although the endowment effect does not appear to explain the disparity, for most subjects there was a reluctance to lose the value or “worth” represented by the good. This finding could be interpreted as indicating a desire for a good deal (perhaps accentuated by risk aversion in the face of ambiguity) or as a kind of loss

aversion—indeed, these two explanations become nearly synonymous when the aversion is to losing asset value by selling too low.

As mentioned in the Introduction, it has been argued elsewhere that the disparity suggests indifference curves are not reversible. That is, a person who willingly gives up a certain quantity of good Y to get a unit of good X would then require more than that quantity of Y to give up the unit of X. The endowment effect argues that this would occur because the unit of X is more valuable once it enters the individual's endowment. To the contrary, the dominate explanation suggested by subjects in the verbal protocol experiment implies that the individual is reluctant to give up the unit of X for any less than he thinks he can get for it, or for less than he thinks it is worth in the market place. Unless indifference curves are redefined to reflect such asset values, we would conclude based on subjects' statements that indifference curves remain reversible, at least for inexpensive market goods.

It must be noted that although the endowment effect may do little to explain a WTA-WTP disparity for inexpensive market goods, the endowment effect may play a major role in a disparity for other types of goods. For example, environmental goods, which cannot be sold in the market place to willing buyers, may indeed increase in value once they enter a person's endowment. Further research using the verbal protocol method to understand motives for WTA and WTP for goods without obvious prices would seem to be a worthwhile endeavor. But care must be exercised even there that the endowment effect is not confused with other explanations such as legitimacy, moral responsibility, and ambiguity.

The verbal protocol results support a commonsense explanation of the disparity found in experiments using inexpensive market goods. Because the results rely on self-reports, which may reflect subjects' rationalizations rather than underlying tendencies or motives, the results must be taken as only offering an hypothesis worthy of careful testing. Nevertheless, the verbal protocol results suggest that, when faced with confusing economic behavior, it can be instructive to ask people for their thoughts as they behave that way.

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## Appendix A

The following two handouts of instructions were read by the subjects.

### Handout # 1

Because one of the six transactions will be binding, and real money will be involved, it is in your interest to carefully consider your answers and honestly state the most you would pay to buy each item, **here and now**, and the minimum amount you would accept to sell each item, **here and now**. Any amount is legitimate, from zero on up.

Don't try to think about what you would pay for the goods (or sell them for) in some other circumstance. We want to know what you would pay for the goods and what you would sell them for here and now. For selling questions, assume that you have just received the good.

One of the most important parts of this experiment is understanding your decision processes as you are deciding the prices at which you would be willing to buy or sell each item. In order for us to record your thoughts, please "think aloud" as you decide about the prices. By "think aloud" we mean that you should tell us everything that passes through your mind as you work to come up with an answer. Please talk aloud constantly as you decide on each price, telling me your reasons for each price before you state the dollar amount. I want to get everything you happen to think of, even things you may think are insignificant or irrelevant.

A tape recorder will record your comments. This tape will be labeled only with a number and the date, not with your name.

### Handout # 2

One of the buying or selling situations will be randomly selected as binding. The price you state for the binding transaction will be compared with a price randomly selected from among 25 possible prices. The 25 prices range from 5¢ to \$10. A list of the 25 prices is attached.

In the case where a **purchase** transaction is selected as binding, if the drawn price is greater than your stated purchase price, you will not purchase the item. If the drawn price is less than or equal to your state purchase price, you will actually purchase the item at the drawn price. Two examples are shown below. In both examples, the stated price is the same, but the drawn price differs.

#### PURCHASE SITUATION:

**Respondent's  
Stated Price:**

**Drawn Price: Outcome:**

\$10

\$8

Respondent buys the item for \$8.

\$10	\$12	Respondent does not buy the item.
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In the case where a **sale** transaction is selected as binding, you will be given the item. If the drawn price is less than your stated selling price, you will keep the item. If the drawn price is greater than or equal to your stated selling price, you will sell the item at the drawn price. Two examples are shown below.

#### SELLING SITUATION:

<b>Respondent's Stated Price:</b>	<b>Drawn Price:</b>	<b>Outcome:</b>
\$10	\$12	Respondent sells the item for \$12.
\$10	\$8	Respondent keeps the item.

Notice that in a purchase situation, the higher your stated purchase price is, the more likely it is that you will actually buy the item. Also, the higher your stated price, the higher the actual purchase price is likely to be. In a selling situation, the lower your stated selling price is, the more likely it is that you will actually sell the item. But, the lower your stated selling price, the lower the actual selling price is likely to be.

Since one of the situations will be binding and a real cash transaction may therefore take place, it is always in your best interest to honestly state the most you would pay to buy each item, and the least you would accept to sell each item, now, in this situation. Any amount is legitimate (for both buying and selling) from \$0 on up. In other words, treat each question as if it were the binding transaction, and decide how much you would really spend **here** and **now**, or how much you would really sell for **here** and **now**.

## Appendix B

The following list contains statements selected from the transcripts of the 21 subjects. The 15 categories are listed in the order in which they are presented in Table 2.

### 1. Personal utility or disutility of item

I don't really need a notebook.

I like this mug; it's a real nice mug.

I have a lot of mugs at home and don't really need another one.

Almond mild chocolate is extremely tempting, and I haven't had lunch yet, and I love it.

I really don't eat candy very often. I just try to stay away from it.

### 2. Item quality and characteristics

It looks like a good kind of candy bar.

It's not very attractive.

It has a lot of paper, and it's bound.

It's big, it's not plain, it's got nuts.

### 3. What it costs at the store; what it's "worth"

I'm thinking of what I know about prices of mugs.

So the question is—what would it sell for? I think it's worth \$2.

I'd probably go around \$5 since that's about the typical price.

I would go cheaper than what you can get it for in the grocery store.

I like the mug a lot... I probably wouldn't buy it myself...would probably sell it for \$6. That's probably around what it's worth.

It's probably worth a bit more but it's not worth that much to me.

### 4. What someone else would spend for it; usefulness to others; make a profit

I wouldn't buy it, but if I could sell it for something I might as well.

The worth of the book to me is probably about 25¢, but to someone else I think they would say \$2 is a good deal...

My need for this chocolate bar is less than I think I can get for it.

\$5...If someone really wanted something like this they'd probably pay \$5.

There's probably a lot of people who could use this notebook, but I don't have any use for it.

I don't like chocolate very much, but it seems like a lot of people really do like chocolate.

I believe there are some people who want it more than I do.

It's probably worth a bit more but it's not worth that much to me, so ... by getting a dollar for it I'm getting a profit out of it.

There's this market mentality: buy low, sell high.

### **5. Get a “good deal,” a “bargain”; spend only a trivial amount**

I'm really not at all interested in having it, but I would be willing to spend 50¢, which is a pretty minimal amount.

I'd say 10¢ for the notebook also because it doesn't mean anything to me.

\$3 isn't an amount I'd worry about giving up.

\$1--probably is a lot more in the bookstore, so a bargain.

I probably wouldn't buy it in a store, but if I got a good deal on it—I think I'd pay \$1, because that's a good deal...it's much less than it's worth.

### **6. A “reasonable” or “fair” price, or compromise price between what it costs at the store and what it's worth to me**

I like this mug. \$3 sounds reasonable to sell it.

I still think \$4.50 would be a fair price for it.

Paying something toward what it's worth, but not paying top market dollar.

\$1.50—I'm striking a balance between what I would pay for it and what I feel it's probably sold for in the stores.

### **7. Ambiguity (e.g., “probably,” “might,” “not sure,” “maybe”)**

About price: I'm thinking of them as being \$2.50 or some number like that in the store.

About value to me: I don't know if I really like this.

About value to others: I'm not sure how many people would find uses to the notebook.

### **8. Gift potential**

I'd take it for 10¢ and probably give it to someone.

It's a good gift.

I could give it to someone for Christmas or I could keep it.

It's something I could share with other people.

### **9. Facilitating a sale; selling at a low enough price to make a sale likely**

I would probably want to give a pretty decent price, so that someone would want to buy it.

\$2 because I want to get rid of it.

To get it off my hands I'll let it go for \$1.

I want to get rid of it, so I would sell it cheap.

### **10. Opportunity cost (what else I could buy with the money); my desire to get money**

I'd love to keep it and it's interesting it's superseding my desire to get money for it. Rather than get a few dollars I'd rather have the chocolate bar. ... If I had eaten lunch it would probably be different. ... I'm going to go with wanting the chocolate rather than wanting the money.

Looks good...and I love almonds, but of course I like money too; if I had money right now I'd go buy some stamps.

\$2 would be better to have than the notebook, for I could buy something else with it.

\$1.50...for more than that I could go downstairs and get a real lunch.

### **11. Lack of funds; need to conserve or make money**

I'm pretty broke.

I don't have a lot of expendable income right now.

Considering by budget right now, that's the most, \$1.

### **12. Loss aversion**

Because I don't really need it, I probably wouldn't buy it, but I'd like to keep it if I had it.

Because I wanted it, but I didn't want it so much that I'd pay \$10 for it, so...I said \$10 [to sell so that] I wouldn't lose it.

Before, you know, I had it, it was kinda cool I had it, so it was mine and I was selling [and bid \$2]. But now I can pick something else, so I'd say 50¢.

When I had it, I wouldn't be willing to part with it as easily, cause I like it, and it would take a lot for someone to take it from me, whereas if someone just showed me this mug and said do you want to buy it, I could pick out of a whole bunch of other mugs and might not want this one.

### **13. Replacement cost (sufficient to buy another)**

I would sell it for \$6...with \$6 I could go and buy another one.

\$1.50...that's about how much I would spend [for one] and if I had \$1.50 I'd just go buy another one so I wouldn't have to worry about it.

I like this mug. I'd be willing to sell it for a price that, if I did sell it, I could buy another one.

### **14. Transaction cost (to cover my time or effort trying to sell it or buy it)**

And I'd want to make a little bit extra for my time trying to sell it, so \$6 would make it good, not too much but still worth my effort.

I have the idea that if I have it then it takes effort to sell it even though it doesn't, so taking something away from me is more expensive than me having to buy it.

### **15. Cost to manufacture**

I don't think it costs that much to make one [mug].