The Seller's Sense: Buying-Selling Perspective Affects the Sensitivity to Expected-value Differences

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Abstract

Previous work comparing pricing decisions by buyers and sellers has primarily focused on the endowment effect, the phenomenon that selling prices exceed buying prices. Here we examine whether pricing decisions by buyers and sellers also vary in sensitivity to differences between objects' expected value (EV). Both a loss-aversion account (which posits that losses are weighted more heavily than gains) and a loss-attention account (which posits increased attention to a task when it involves possible losses) predict that pricing decisions by sellers should exhibit higher sensitivity. The latter, however, additionally predicts that this pattern should only emerge under certain conditions. In Study 1 and 2 we reanalyzed two published datasets in which participants priced monetary lotteries as sellers or buyers. It emerged that sellers showed greater EV sensitivity (defined as the rank-correlation between the set price for each lottery and its expected value) except in a condition with an extended deliberation time of 15 seconds. In Study 3 the buyer-seller difference in EV sensitivity was replicated even when the pricing task was presented repeatedly, while in Study 4 it was eliminated when buying and selling trials were randomly mixed. The reduction of the "seller's sense" in long deliberation and mixed trials settings supports an attentional resource-based account of the differences between sellers and buyers in their EV sensitivity.

Keywords: Decision making; endowment effect; pricing; loss aversion; loss attention

What is the price of an object? Empirical studies on the construction of value have demonstrated systematic differences between prices set by buyers and sellers. The large majority of these studies have focused on the "endowment effect", the tendency to value an object more upon selling it than upon buying it (e.g., Thaler, 1980; Kahneman, Knetsch, & Thaler, 1990; Van Boven, Dunning, & Loewenstein, 2000; Johnson, Häubl, & Keinan, 2007; Schurr & Ritov, 2013). Here we highlight a different, largely neglected issue, of whether buying and selling prices also differ in the degree to which they track an item's objective value (e.g., expected value), and in particular the accuracy to which the rank order of prices reflects the rank order of items' objective value. Previously, it has been suggested that sellers often have an advantage of knowing things that buyers do not know (Akerlof, 1970; Baron, 2004). For instance, dealers of used cars are presumably better at ranking cars in their lot according to their actual worth than potential buyers because of their general expertise and familiarity with these specific cars (Akerlof, 1970). Indeed, one might argue that this asymmetric information is the basis of *caveat emptor* legal principles, requiring buyers to beware and pay attention to the deal they are negotiating (Coff, 1999). We examine whether sellers have an accuracy advantage over buyers even when both have the same information about the object.

It is commonly assumed that sellers experience a greater sense of loss than buyers. For instance, Kahneman et al. (1990) suggested that sellers experience the act of selling an object as a loss whereas buyers do not perceive the money paid for an item as a loss. This potential loss increases the object's subjective value due to loss aversion (Kahneman & Tversky, 1979), hence giving rise to the endowment effect. A more moderate proposition was put forward by Bateman, Kahneman, Munro, Starmer, and Sugden (2005) who suggested that buyers perceive the money paid as a loss as well, but sellers' loss is greater. It has also been proposed that sellers are more attached to the object they sell (Beggan, 1992; Gal, 2006; Schurr & Ritov, 2013; Morewedge, Shu, Gilbert, & Wilson, 2009), for instance, because they identify themselves with the object to a greater extent (Morewedge et al., 2009); here also it follows that sellers give greater weight to giving up the object than buyers give to receiving it and therefore perceive losses as more significant.

The notion that sellers' decisions are framed in losses (or in more significant losses) implies that under several existing models of the psychological effect of losses, sellers should better track value differences between objects. Under loss aversion—that is, the assertion that losses receive greater subjective weight than gains (Kahneman & Tversky, 1979)—the seller's experience of a potential loss leads to a higher subjective value of the object. This implies higher sensitivity of sellers in tracking differences due to the slope of prospect theory's value function being higher (and closer to linearity) for losses than for gains. An increased sensitivity for sellers is also predicted by Yechiam and Hochman's (2013a) loss attention account, which posits that losses increase the attention invested in a task. Specifically, loss attention assumes a slow decaying attentional effect of losses that spills over to various stimuli within the same task presented simultaneously or shortly following the losses (e.g., intermittent gains).[1] With increased attention, the sensitivity to value differences between objects should improve (under certain conditions, see below). Both accounts therefore suggest that losses increase sensitivity to differences in items' relative value (see e.g., Bereby-Meyer & Erev, 1998; Maddox, Baldwin, & Markman, 2006; Saguy & Kteily, 2011; Yechiam & Hochman, 2013b) which should lead to a sensitivity advantage for sellers, but they assume different mechanisms underlying the behavior.

A major difference between the loss-aversion and loss-attention accounts is that under the latter sellers' higher sensitivity to relative values should be more pronounced in situations that involve capacity constraints, such as when having little deliberation time (Yechiam & Hochman, 2014). In such situations performance is highly resource-limited (Norman & Bobrow,

[1] Hence, loss attention (Yechiam & Hochman, 2013a) does not imply that the weight of losses is larger than gains when gains and losses are presented simultaneously or intermittently (and thus does not predict, for instance, that people avoid lotteries that offer a 50% chance to win and a 50% chance to lose a certain amount of money). Nevertheless, in certain settings it predicts effects that are similar to those implied by loss aversion: for example increased sensitivity to the incentive structure in tasks framed by losses.

1975), and therefore the effect of selective attention allocation should be more pronounced.[2] A second major difference between the accounts is that under loss attention (Yechiam & Hochman, 2013a), due to the slow decay of the attentional effect, differences between selling and buying trials should be reduced when the two types of trials are intermittently presented within a given task. Namely, when buying and selling trials are mixed (in a within subject design), the additional attention invested in selling trials is expected to "spill over" to the buying trials, thus diluting potential performance differences due to attention. In summary then, the loss attention account suggests important boundary conditions for sellers being more sensitive to differences in relative value than buyers.

A loss-aversion account does not necessarily predict these boundary conditions. With respect to resource limitation, one could argue that extended deliberation time activates System 2 (which is associated with analytical reasoning; Kahneman & Frederick, 2002) and encourages more rational considerations, which should reduce loss aversion. Consequentially, extended deliberation should also lead to smaller differences in sensitivity to relative values between sellers and buyers. However, this is inconsistent with experimental results showing that increased deliberation time typically enhances loss aversion and the endowment effect (Ashby et al., 2012; Chan & Saqib, 2013; Kocher, Pahlke, & Trautmann, 2013). Even more distinctly, loss aversion does not predict any effect of trial mixing. Since it assumes that the effect of losses is weight-based and stimulus-specific, the same effect should exist irrespectively of whether the gain/loss perspective is manipulated in different blocks (or different subjects) or in mixed trials.

As a proxy for differences in the objective value of lotteries we focus on differences in their expected value (i.e., their mean payoff). We will refer to participants' sensitivity to differences in expected value as *EV sensitivity*. We evaluate EV sensitivity by testing how accurately the ranking of buying and selling prices is correlated with the ranking of the lotteries according to their expected values —a standard approach to assess pricing accuracy (Conover,

[2] This prediction is implied by the Yerkes-Dodson law, because of the diminishing marginal benefit of increased attentional investment as a function of the initial investment (see Kahneman, 1973).

1986).[3] EV sensitivity can be further broken down into two parts: sensitivity to changes in outcome (e.g., the difference between 10% to get $12, $10, or $8) and sensitivity to change in probability (e.g., 5 or 10% to get $10); it therefore reflects the degree to which one's judgments are affected by these objective determinants of value. We examine experimental datasets that enable to partially or completely segregate these two aspects. In Studies 1 and 2, we reanalyze data from Pachur and Scheibehenne (2012) and Ashby, Dickert, and Glöckner (2012), respectively. Neither of these studies examined the participants' EV sensitivity. Overall, the two studies cover seven conditions varying in task demands and structure of the lotteries. Studies 3 and 4 include new experiments that evaluate the boundary conditions of the asymmetry between buyers and sellers' EV sensitivity.

Study 1: Do sellers and buyers differ in EV sensitivity?

Pachur and Scheibehenne (2012) had participants indicate either buying or selling prices for monetary lotteries. The lotteries differed in expected value, allowing us to test the EV sensitivity of buyers and sellers. In addition to perspective (i.e., buyer vs. seller), Pachur and Scheibehenne (2012) manipulated two further task variables. First, their study included a description-based condition, where the probability and outcome of each lottery was provided as summary descriptions to the participants; and an experience-based condition, in which participants learned the payoff distribution of the lotteries through sequential sampling (they could draw as many samples as they wished). Second, they administered two sets of lotteries (see Table 1). Set *A,* taken from Ganzach (1996), included lotteries where all outcomes occur with the exact same probability. In these lotteries, EV sensitivity depends only on sensitivity to changes in outcomes (since the probability is fixed, at 0.2). Lottery Set *B*, based on Slovic, Griffin, and Tversky (1990), included variations in both probability and outcome magnitude (it

[3] For instance, if objects expected-value ranking is 1,2,3 and one ranks them as 1,3,2 then the individual's EV sensitivity is the Spearman correlation between these series, $\rho = 0.50$ (see Study 1 Method section for further explanation).

thus confounds the sensitivity to probability and outcome changes). Previous studies have shown that sellers make lower price adjustments in response to changes in probability levels than buyers (cf. Casey, 1995; Shahrabani, Benzion, & Shavit, 2008).[4] This suggests that even if sellers show higher EV sensitivity than buyers, this tendency may be counteracted by their risk insensitivity in the case of varying probabilities. Hence, we expected more pronounced differences in EV sensitivity between buyers and sellers in Set *A* than in Set *B*.

Method

Our main analysis focused on participants' relative EV sensitivity (Conover, 1986). To that end, we calculated for each participant the (Spearman) rank correlation ρ between their pricing decisions for each of the 30 lotteries and the lotteries' expected values. The rank correlation ensures that the difference is not affected by extreme values. An advantage of this correlation index is that it does not take into account deviations of the mean indicated price from the lotteries expected value, and thus provides a measure of accuracy that is independent of the size of the endowment effect (we also briefly consider accuracy in terms of absolute deviation, see Appendix section).

The study included 152 participants, who were randomly allocated to the description and the experience conditions. Overall, it had a 2 × 2 × 2 mixed design, with the information condition (i.e., description vs. experience) manipulated between subjects. Perspective (i.e., buyer vs. seller) was manipulated within subjects in two separate order-controlled blocks of 30 lotteries, while the two lottery sets (Sets *A* vs. *B*) were mixed and presented in random order. The experimental instructions appear in Pachur and Scheibehenne (2012). Briefly, in the seller condition, participants were asked to imagine that they owned the right to play a lottery and to

[4] This tendency was particularly evident for small probability events, and thus can be explained based on the notion that sellers often plan to relinquish the object and if they do, they are not exposed to the risk (Shahrabani et al., 2008) and that sellers tend to focus on more positive aspects of the lottery (Ashby et al., 2012; Pachur & Scheibehenne, 2012).

indicate for each lottery the minimum amount of money they would accept to sell that right (willingness-to-accept; WTA). In the buyer condition, participants were asked to imagine that they had the opportunity to buy the right to play a lottery and to indicate for each lottery the maximum amount of money they would be willing to pay for that right (willingness-to-pay; WTP). The pricing decisions were hypothetical.

Results

Figure 1 presents the mean Spearman ρ (across participants) of buying (WTP) and selling (WTA) prices, separately for the description and the experience conditions and for the two lottery sets. As can be seen, sellers showed substantially higher EV sensitivity than buyers, both in the description and in the experience conditions, and for both sets of lotteries. This was confirmed by a mixed-factorial ANOVA, with perspective and lottery set as within-subjects factors and information condition as a between-subjects factor. There was a main effect of perspective, $F(1,150) = 85.3$, $p < .0001$, indicating greater EV sensitivity for sellers. In addition, there was a perspective by lottery set interaction, $F(1,150) = 8.16$, $p = .005$; the interaction indicates that sellers' higher EV sensitivity was more pronounced for Set *A*, where the probability was the same and changes were only in the outcome; than in Set *B* where both of these aspects varied.[5]

We further examined whether these buyer-seller differences in EV sensitivity might be due to differences in sensitivity to different levels of risk. A common measure of risk is the coefficient of variation (CV; Weber, Shafir, & Blais, 2004). When examining the relation between the expected values of the lotteries and their CV, the correlations were $r = -0.31$ for lottery Set A and $r = 0.34$ for lottery Set B. We thus re-ran the correlation between ranked price and EV controlling for each lottery's CV (i.e., using partial correlation). This analysis yielded a

[5] There was also a main effect of lottery set: $F(1,150) = 285.9$, $p <. 001$, with higher EV sensitivity for lottery Set *A*, and a main effect of description/experience: $F(1,150) = 11.73$, $p =. 001$, with higher EV sensitivity for the description condition.

similar pattern as before (main effect of perspective: $F(1,150) = 72.7$, $p < .0001$; interaction of perspective and lottery set: $F(1,150) = 10.16$, $p = .002$), demonstrating that the higher EV sensitivity of sellers is not due to higher sensitivity to risk.

Finally, we explored the association between sellers' higher EV sensitivity and the size of the endowment effect (i.e., the WTA-WTP gap). To that end, we examined the correlation between the difference between buying and selling prices (for each individual) and the EV-sensitivity score for the selling prices. This was done separately for the description and experience conditions and for lottery Sets *A* and *B*. Overall, the results showed little evidence for a consistent link between individual differences in EV sensitivity and in the endowment effect. A positive correlation was observed in only one of the four conditions (description, Set *A*: $r = 0.25$, $p = .03$), while in the remaining conditions the correlation was either negative (description, Set *B*: $r = -0.52$, $p < .001$) or non-significant (experience, Set *A*: $r = 0.08$, $p = 0.47$; Set *B*: $r = 0.17$, $p = 0.15$). These results suggest that the accuracy difference between sellers and buyers and the endowment effect are independent phenomena.

In summary, we observed higher EV sensitivity in the pricing decisions of sellers compared to those of buyers in lottery Set *A*, in which probability levels were constant and outcomes differed. This suggests that sellers show higher sensitivity to differences in outcomes than buyers. The same finding was observed (though to a lesser extent) in Set *B*, in which both outcomes and probabilities varied. In the next study we directly examine the two aspects of EV sensitivity: sensitivity to differences in outcomes and sensitivity to differences in probability.

Study 2: Pricing decisions under time constraints

In this study we re-analyzed a dataset by Ashby et al. (2012), in which outcome magnitudes and probability levels were systematically varied. Each probability was associated with several possible outcomes; and each outcome was associated with several possible probabilities. This allowed us to separately examine two aspects affecting EV sensitivity: participants' sensitivity to changes in outcomes and in probabilities.

Additionally, this study enabled us to make a first evaluation of the possible explanations for the discrepancy between sellers and buyers' EV sensitivity. As described above, the loss attention account (Yechiam & Hochman, 2013a) predicts that the positive effect of losses on EV sensitivity should emerge particularly under conditions of resource limitation (which could be either enforced or self-inflicted). For example, in Yechiam and Hochman (2014) participants had to concurrently perform two tasks, and the secondary task either did or did not involve losses. Losses increased task performance to a much greater extent when there was a strict response time limitation. Ashby et al. (2012) studied the effect of time limitations on the endowment effect by setting the participants' response time to either 5, 10, or 15 seconds. This allowed us to examine whether the gap between buyers and sellers' EV sensitivity is larger when little time is available to make a decision.

Method

The study included 84 participants, who attended two experimental sessions. In the first session participants priced lotteries in one perspective (i.e., either as sellers or buyers) and in the second session, conducted two weeks later, they priced the same lotteries from the other perspective.

The study had a 2 × 3 within-subjects design, with perspective (buyer vs. seller) and deliberation time (5 s, 10 s, 15 s) administered in a random order-controlled manner. Participants evaluated 20 lotteries (see Table 2). The lotteries had 5 different probabilities: 5%, 25%, 50%. 75%, and 95% chance; and 4 different outcomes (8.67, 17.33, 26, 34.67). The instructions appear in Ashby et al. (2012). Briefly, participants were asked to provide certainty equivalents for each lottery while imagining either that they had the opportunity to buy the right to play the lottery (buyer condition) or that they owned the right to play the lottery and could sell this right (seller condition). Following some example trials, lotteries were presented in a fixed random order. An incentive-compatible procedure, the BDM method, was used (Becker, DeGroot, & Marschak, 1964).

As noted above, we evaluated two facets of EV sensitivity. In order to examine the sensitivity to outcome changes, we calculated EV sensitivity separately for each probability level (in this case ρ reflects correctly ordering changing outcomes within a given probability). In the analysis of variance, we additionally pooled the ρ score across each of three probability levels, namely 50%, moderate (25% and 75%), and extreme (5% and 95%) probabilities. This grouping was done because more extreme probabilities are assumed to lead to greater departure from expected-value based estimations (as implied by prospect theory; Kahneman & Tversky, 1979). In order to examine the sensitivity to differences in probability, we calculated EV sensitivity separately for each outcome level (in this case, ρ reflects correctly ordering probabilities).

Results

Since the dataset enabled to independently study the effect of differences in outcomes (i.e., amounts) and probabilities, we report the differences between sellers and buyers in these two aspects separately.

Sensitivity to differences in outcome. Figure 2 presents the average Spearman ρ correlation (across participants) for the three deliberation time conditions. An ANOVA with perspective (seller vs. buyer), deliberation time (5 s, 10 s, 15 s), and probability level (50%:50%, moderate, extreme) as within-subjects factors, showed that as in Study 1 there was a main effect of perspective, $F(1,82) = 9.34$, $p = .003$, denoting higher EV sensitivity for sellers than for buyers. In addition, there was a main effect of deliberation time, $F(2,81) = 25.80$, $p < .001$, indicating that longer deliberation time led to higher sensitivity; and a main effect of probability level, $F(2,81) = 9.78$, $p < .001$, indicating that sensitivity was lower in lotteries with extreme probabilities.

Importantly, there was also a three-way interaction of perspective by deliberation time by probability level, $F(4,328) = 3.34$, $p = .01$. Post-hoc tests showed that there were main effects of perspective both in the condition with 5 s deliberation time, $F(1,83) = 5.32$, $p = .02$, and in the condition with 10 s deliberation time, $F(1,82) = 7.61$, $p = .007$. Furthermore, in both conditions there was a perspective by probability level interaction, $F(2,166) = 3.49$, $p = .03$ (5s deliberation time); $F(2,166) = 4.47$, $p = .01$ (10 s deliberation time), reflecting a reduction of the gap in EV sensitivity for extreme probability levels (as show in the bottom pane of Figure 2). There was no main effect of perspective, however, for the condition with 15 s deliberation time, $F(1, 83) = 0.24$, $p = .63$, nor an interaction of perspective and probability level, $F(2,166) = 0.55$, $p = .58$. Hence, sellers' higher sensitivity to differences in outcome was most pronounced given relatively short deliberation times, but it was absent when deliberation time was extended.

Additionally, as in Study 1, we examined the relationship between sellers' EV sensitivity and the size of the endowment effect. The correlation for the three deliberation times were as follows: 5 s, r =-0.03 (p =.76); 10 s, r = 0.25 (p = .02); 15 s, r = 0.20 (p = .07). Thus, replicating Study 1, there was no consistent and strong correlation between sellers' EV sensitivity and the endowment effect. Moreover, sellers' higher EV sensitivity for amount changes emerged most strongly for the short and medium deliberation condition, while in Ashby et al. (2012) the endowment effect was most pronounced for the medium and long deliberation-time conditions (see also Table 2). This further indicates that the endowment effect and the asymmetry in EV sensitivity are distinct phenomena.

Sensitivity to differences in probability. Figure 3 presents the average Spearman ρ correlation for the three deliberation time conditions, when only the probability level is changed. An ANOVA showed no effect of perspective ($F(1,82) = 0.01$, $p = .93$) and no interaction between perspective and deliberation time ($F(1,82) = 2.12$, $p = .12$). Thus, there was no difference between buyers and sellers in sensitivity to differences in probability. The only significant effects were of deliberation time ($F(2,81) = 15.70$, $p < .001$): EV sensitivity tended to increase with deliberation time; and of amount ($F(3,80) = 7.91$, $p < .001$): EV sensitivity was higher for larger amounts.

We also conducted an exploratory analysis to identify the reason for this null effect. Shahrabani et al. (2008) suggested that sellers have a particular bias of overweighting small probabilities of gaining. If this bias is strong enough, it may mask any advantage they have in sensitivity to probability changes. We therefore conducted the same analysis again but included only lotteries with a probability equal to or larger than 50%. The results showed that there was a substantial EV-sensitivity advantage for sellers (across amounts, 5 s: $\rho_{seller} = 0.61$, $\rho_{buyer} = 0.53$; 10 s: $\rho_{seller} = 0.75$, $\rho_{buyer} = 0.69$; 15 s: $\rho_{seller} = 0.71$, $\rho_{buyer} = 0.64$), which was significant in the ANOVA ($F(1,79) = 3.26$, $p = .008$). This suggests that for lotteries where the outcomes had medium to high probabilities, sellers showed enhanced EV sensitivity. For probabilities lower than 50% there was only a close to significant advantage to buyers in EV-sensitivity ($F(1,60) = 3.95$, $p = 0.051$); which may reflect seller’s tendency to inflate small probability events and the resulting lower sensitivity for changes in these probability levels (Casey, 1995; Shahrabani et al., 2008). Nevertheless, this analysis should be interpreted with caution in light of its exploratory nature. [6]

Study 3: Replication and robustness to repeated presentation

In this study we examined whether the finding that buyers and sellers differ in their EV sensitivity (and particularly in their sensitivity to differences in amount), can be replicated in a new experiment and whether the difference is robust to multiple task presentations. It has been

[6] We also analyzed the results of Ashby et al.’s (2012) Study 2. In contrast to Study 1, in this study each lottery had a unique probability and outcome, and thus it was difficult to examine their influence separately. Moreover, the expected value of the lottery was mostly affected by the probability level ($r = .83$) and less so by the outcome of the lotteries ($r = 0.26$). The results showed no buyer-seller differences in EV sensitivity: the mean (median) EV sensitivity was $\rho_{buyer} = 0.75$ (0.78), $\rho_{seller} = 0.73$ (0.84). This, however, was likely due to sellers being less sensitive to differences in probability (as found in Study 2)

found that the endowment effect is reduced in repeated transactions (Sayman & Oncular, 2005; List, 2003). Here we tested whether the buyer-seller disparity in EV sensitivity is similarly reduced in repeated trials. For that purpose, we administered Pachur and Scheibehenne's (2012) task, but presented each lottery three times within a buying/selling condition. Additionally, we examined whether buyer-seller differences would emerge in response time. Under loss attention (Yechiam & Hochman, 2013a), the seller perspective is predicted to be associated with greater deliberation—as a result of greater investment of attentional resources—and this should be reflected in longer response time relative to the buyer perspective (Bettman, Johnson, & Payne, 1990; Ayal & Hochman, 2009; Horstmann, Ahlgrimm, & Glöckner, 2009).

Method

Participants. Fifty-four undergraduates from the Technion, Israel Institute of Technology (26 women and 28 men) took part in the study. They were randomly allocated to the selling and buying conditions while keeping an equal number of participants in both groups (n = 27). The participants earned a fixed fee of NIS 30.

Materials. The task was the same as in Pachur and Scheibehenne's (2012) description-based condition, described in Study 1 (i.e., there were two set of lotteries, Set *A* and Set *B*). The only major difference was that perspective (i.e., buyer vs. seller) was manipulated between subjects and that each participant completed three blocks of the lotteries. Within each block, the order of the lotteries was randomized for each subject. Additionally, in order to emphasize each perspective, in the seller condition the selected price and all prices higher than the selected price were highlighted in green (to denote the fact that the participant is setting a minimal price; see Figure 4 for an illustration). By contrast, in the buyer condition, the selected price and all lower prices were highlighted in green (to denote the fact that the participant is setting a maximal price). All prices were in New Israeli Shekels.

Results

The left panel of Figure 5 shows the mean Spearman ρ (across participants) in the buyer and seller conditions, separately for each of the three trial blocks. The top and bottom panels pertain to the two lottery sets (i.e., Set *A* and Set *B*, respectively). As can be seen, sellers showed higher EV sensitivity than buyers (in both sets), and, importantly, this pattern was maintained across trials. To corroborate this pattern statistically, we conducted a mixed-factorial ANOVA, with lottery set and trial block as within-subjects factors and perspective as a between-subjects factor. As in the previous studies, the results showed a significant main effect of perspective, $F(1, 52) = 32.86$, $p < .001$. Importantly, the interaction between perspective and trial block was not significant, $F(2, 104) = 0.03$, $p = .97$: Repetition thus did not reduce buyer-seller differences in EV sensitivity.[7]

Next, we examined participants' response times. The data appears in the right panel of Figure 5. As predicted by the loss attention account (Yechiam & Hochman, 2013a), responses tended to be longer in the seller than in the buyer condition. The main effect of perspective on response time was significant ($F(1, 49) = 73.75$, $p < .001$), and there was also a significant interaction between perspective and trial block ($F(2,98) = 20.93$, $p < .001$), marking a reduction in this effect when the task is repeated.

As shown in the middle panel of Figure 5, there was also a robust endowment effect. A mixed-factorial ANOVA showed a significant main effect of perspective ($F(1, 52) = 30.57$, $p < .001$), with selling prices exceeding buying prices in almost all blocks of trials. The main effect of trial block was not significant, and neither was any interaction involving trial block. Thus, the endowment effect also did not diminish with task repetition.

The findings of this study thus indicate that the buyer-seller gap in EV sensitivity was replicated with new data and also where lotteries were priced repeatedly, suggesting that

[7] Additionally, there was a significant effect of lottery set, $F(1,104) = 66.1$, $p < .001$, and a significant interaction between perspective and lottery set, $F(1,104) = 5.41$, $p = .02$: As in study 1, participants had higher EV sensitivity in lottery Set *A*; but differing from Study 1, the difference between sellers and buyers was somewhat higher in Set *B* (possibly due to a ceiling effect in Set *A*). No other main effect or interaction was significant.

participants did not habituate to the differences in perspective. Additionally, we observed that sellers responded more slowly, which is consistent with loss attention account (Yechiam & Hochman, 2013a).

Study 4: Eliminating buyer-seller asymmetries in EV sensitivity

The previous three studies have demonstrated the robustness of buyer-seller differences in EV sensitivity. The loss-attention explanation suggests that this effect of perspective can be reduced by manipulations that increase buyers' attention to the task. Consistent with this notion, in Study 2 increasing the time available for deliberation to 15 seconds eliminated the gap in EV sensitivity. In Study 4, we attempted to reduce the gap in attention level by randomly mixing buying and selling trials. This manipulation is commonly used in the attention literature to examine effects of attentional decay (Allport, Style, & Hsieh, 1994; Gopher, Armony, & Greenshpan, 2000; Strayer & Kramer, 1994). In the present context, the loss attention account (Yechiam & Hochman, 2013a) predicts a slow decaying attentional effect of losses, implying that the additional cognitive resources invested in selling trials should spill over to other intermittently encountered trials (as long as they appear within a short time period). Therefore, it was predicted that mixing buying and selling trials would increase task attention generally, leading to similar levels of EV sensitivity for buying and selling trials.

Method

Participants. Forty-eight Technion undergraduates (24 females and 24 males), who did not participate in Study 3 took part in the study. The participants earned a fixed fee of NIS 30.

Materials. The task was identical to the Pachur and Scheibehenne (2012) description-based condition, described in Studies 1 and 3 (i.e., there were two sets of lotteries, Set *A* and Set *B*). The protocol followed that of Study 1 (i.e., buyer and seller perspective was manipulated within-subjects), except that selling and buying trials were randomly intermixed for each participant rather than being presented as separate blocks. The screen layout was as in Study 3 (see Figure 4).

Results

Figure 6 presents the mean Spearman ρ in the different experimental conditions. As can be seen, there was virtually no difference in EV sensitivity between selling and buying trials. An ANOVA with seller/buyer perspective and lottery set (i.e., Set *A* vs. Set *B*) as a within-subjects factor showed no effect of perspective ($F(1, 41) < 0.1$, $p = 0.99$) nor an interaction between perspective and lottery set ($F(1, 41) = 0.24$, $p = 0.63$). The only significant effect was of lottery set, $F(1, 42) = 39.39$, $p < .001$ (as in the previous studies, EV sensitivity was higher in lottery Set *A*). Thus, it appears that mixing buying and selling trials eliminated the differences in EV sensitivity between perspectives.

Interestingly, however, there was still a basic endowment effect. The mean (SE) prices for lottery Set *A* were 44.42 (1.77) for sellers compared to 33.06 (1.22) for buyers. For lottery Set *B* the respective prices were 4.45 (0.32) for sellers and 2.61 (0.17) for buyers. The effect of perspective on price levels was significant ($F(1,44) = 36.51$, $p < .001$) and the effect was more prominent in Set *A* than in Set *B* (as indicated by an interaction between perspective and lottery set, $F(1,44) = 32.15$, $p < .001$). These results demonstrate that the occurrence of the endowment effect is not a sufficient condition for the emergence of buyer-seller differences in EV sensitivity; the endowment effect and the buyer-seller discrepancy in EV sensitivity are thus independent phenomena.

As in Study 3, we also examined participants' response times. The mean response time for lottery Set *A* was 12.98 s (SE = 1.57) for sellers compared to 10.24 s (SE = 0.68) for buyers. For lottery Set *B* the mean response time was 9.90 s (SE = 0.70) for sellers and 9.61 s (SE = 0.58) for buyers. The effect of perspective on response time was significant, $F(1,47) = 4.49$, $p = 0.04$. However, the effect size was much smaller than in Study 3, where perspective was manipulated between subjects (Cohen's $F = 0.13$ vs. 0.40 in Study 3). This is consistent with the suggestion that mixing buying and selling trials reduces the disparity in the allocation of attention across the two conditions.

Note that the similar EV sensitivity of sellers and buyers in this experiment can reflect an effect of selling trials on buying trials (namely, increased attention to both trial types), but also an effect of buying trials on selling trials (reduced attention in both trial types; see a related phenomenon in Yechiam, Arditi, & Zahavi, 2015).[8]

General Discussion

Does asking people to price an object either from a buyer's or a seller's perspective affect the sensitivity to differences in the value of different objects? In Study 1 and 2, an examination of seven different study conditions revealed that in six conditions involving a self-paced task (in Study 1) or a deliberation time constraint of 5 or 10 seconds (in Study 2), selling prices correlated with the lotteries' EVs to a greater extent than buying prices. This pattern was replicated in Study 3. Additional analyses showed that the differences in EV sensitivity are mainly due to sellers being more sensitive to differences in outcome, but that buyers and sellers did not differ in sensitivity to probabilities. The latter finding may be due to the flatter subjective probability function of sellers, particularly for items with small probability gains (Casey, 1995; Shahrabani et al., 2008).[9]

Sellers' advantage in EV sensitivity did not emerge in the condition in which participants were forced to deliberate for an extended time of 15 seconds. This is consistent with an attention-based account (Yechiam & Hochman, 2013a), according to which the effect of

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[8] While we cannot test this directly, a comparison of Study 4 and Study 3 (block 1) reveals that the EV sensitivity results of Study 4 (Set *A:* $\rho_{buyer} = 0.80$, $\rho_{seller} = 0.81$; Set *B:* $\rho_{buyer} = 0.64$, $\rho_{buyer} = 0.63$) fall midway between the two conditions of Study 3 (Set *A*: $\rho_{buyer} = 0.74$, $\rho_{seller} = 0.89$; Set *B*: $\rho_{buyer} = 0.48$, $\rho_{seller} = 0.74$). This suggests that both elevated attention in selling trials and reduced attention in buying trials played a role.

[9] When items differ only in their probability, sellers' flatter subjective probability curve may decrease sensitivity between items despite their attention to losses; and the two effects may counter-balance each other.

perspective on decision quality should emerge especially under conditions of resource scarcity, and less so when people have ample time for processing each item. A possible objection to this interpretation is that sellers showed greater EV sensitivity than buyers also in Study 1, where participants did not have a time limit. However, people frequently do not invest their full attention when controlling the pace of the task themselves (Bettman et al., 1990; Horstmann et al., 2009). Indeed, in Study 3, in which there was no response time restriction, the mean response time was 11.1 seconds in the first block of trials, and 5.0 seconds in the third block of trials, which is close to the medium and short deliberation-time conditions of Study 2. This suggests that individuals do not spontaneously invest the necessary time required for performing equally well in selling and buying conditions. The attention-based explanation is further supported by the results of Study 4, which showed that mixing buying and selling trials within a block eliminated the buyer-seller difference in EV sensitivity. Additionally, in both Study 3 and 4 sellers exhibited longer response times than buyers, suggesting that they take more time to deliberate when the task is self paced.

As noted above, the effect of deliberation time could also be attributed to loss aversion; if we assume that longer deliberation times activate more rational considerations and reduce biases associated with losses. Still, it is hard to reconcile this explanation with the finding that for the same data, Ashby et al. (2012) found an increased endowment effect when deliberation time was extended. It therefore seems difficult to explain both phenomena—an endowment effect and the buyer-seller differences in EV sensitivity—with loss aversion (see further discussion below).

One limitation of our research is that in three of the four studies we used a hypothetical pricing scenario. However, the main findings were replicated in Study 2, which used an incentive-compatible procedure. Moreover, because our measure of EV sensitivity does not depend on the mean price set by each participant, the results seem to be robust to so called "hypothetical" bias (Hausman, 2012), wherein prices in a hypothetical scenario are positively or negatively exaggerated.

Another concern might be that the observed differences between sellers and buyers are due to the specific method we used for assessing EV sensitivity, which focuses on the correlation between stated price and expected value. Several of our findings suggest however, that the EV-sensitivity index is valid: higher EV sensitivity emerged for lottery Set *A* where the gambles differed only in their amount, compared to lottery Set *B* where they also differed in their probability; also, higher EV sensitivity was evident with greater deliberation time in Study 2. Additionally, as detailed in the Appendix, using a measure of accuracy that is based on absolute deviation (by mean square deviation) yielded similar results in all four studies. This latter finding, wherein sellers are close to the expected value mark, is in fact not an anomaly: a literature review reveals that in most cases selling prices are closer to the expected value than buying prices (e.g., van Dijk & van Knippenberg, 1996; Peters, Slovic, & Gregory, 2003; Van De Ven, Zeelenberg, & van Jijk, 2005; Johnson & Busemeyer, 2005; Shahrabani et al., 2008; Trautmann & Schmidt, 2014; Wieland, Sundali, Kemmelmeier, & Sarin, 2014).

Relation to the endowment effect

In the introduction, we pointed out that both a loss-aversion account—the currently most prominent explanation of the endowment effect—and a loss-attention account suggest buyer-seller differences in EV sensitivity. Several of our analyses, however, indicate that sellers' increased EV sensitivity (relative to buyers') is orthogonal to the endowment effect, that is, the phenomenon that selling prices are usually higher than buying prices. For instance, in Study 2, the endowment effect was most pronounced given long deliberation times, whereas the buyer-seller differences in EV sensitivity emerged most strongly for short to intermediate deliberation times. In Study 4 mixing buying and selling trials eliminated buyer-seller differences in EV sensitivity but the endowment effect nevertheless emerged. Finally, there was no consistent correlation between buyer-seller differences in EV sensitivity and the size of the endowment effect.

So what do these results indicate with regard to the viability of the loss-aversion and loss-attention account and how they are related? The apparent independence of differences in EV sensitivity and the endowment effect highlights that a loss-aversion account cannot singly explain both phenomena. At the same time, an attention-based mechanism cannot singly account for both phenomena either. One possibility therefore is that loss aversion and loss attention refer to two completely distinct processes and mechanisms. Namely, there could be dissociation between the increase in task attention due to losses and the subjective weighting of the loss component. Indeed, effects of loss attention (e.g., increased arousal and performance with losses) have been demonstrated even in the absence of loss aversion (Yechiam & Hochman, 2013a, b). Alternatively, though, the robust endowment effect observed here and elsewhere could be driven mainly by factors that are not related to losses, but rather reflect different processes involved in the construction of preferences when selling and buying (Carmon & Ariely, 2000; Johnson et al., 2007; Ashby et al., 2012; Pachur & Scheibehenne, 2012)

Implications and extensions

The current findings are in line with previous results showing that sellers are more sensitive to differences in store-price labels for a given product (Weaver & Frederick, 2012). Previously, this has been explained by the notion that sellers anchor their prices on their expectations of the market price rather than their personal needs. Our results, and the support for an attention-based mechanism, suggest that it could also be that sellers are more sensitive to differences in outcomes. In the current study, buyers and sellers made pricing decision outside of a market or store context, and so it is unlikely the buyer-seller differences in EV sensitivity are due to differential attention to a reference price. Instead, it is possible that buyer-seller differences in outcome sensitivity, which seem to be driving the buyer-seller differences in EV sensitivity, might also be underlying, at least in part, previous manifestations of buyer-seller differences in sensitivity to product prices.

The current findings may also illuminate previous findings of an asymmetric sensitivity of sellers and buyers to external cues, as observed in studies on “coherent arbitrariness” (e.g., Ariely, Loewenstein, & Prelec, 2003; Simonson & Drolet, 2004, Tufano, 2010; Fudenberg, Levine, & Maniadis, 2012). In these studies, participants are asked to make a pricing decision after having been exposed to an arbitrary number (e.g., the last two digits of a person’s social security number). It has been found that pricing decisions tend to be biased in the direction of the arbitrary value, and this bias is coherently applied in subsequent evaluations. However, buyers were typically more affected by such arbitrary values than sellers (Simonson & Drolet, 2004, Fudenberg et al., 2012; Maniadis, Tufano, & List, 2014; but see Sugden, Zheng, & Zizzo, 2013 for a different result). Moreover, selling prices were found to be particularly resistant to incompatible values, that is, “those that do not relate to the relevant source of uncertainty (market price)” (Simonson & Drolet, 2004, p. 686; see also Tufano, 2010; Maniadis et al., 2014). This seems consistent with the idea that sellers invest more attention in on-task cues and are less sensitive to off-task cues.

Our findings also open up interesting predictions with respect to the disparate cognitive processes of sellers and buyers. As regards lotteries, Ashby et al. (2010) have highlighted that sellers tend to focus more on high than on low potential outcomes. This was argued to be due to a bias in visual attention (towards positive aspects). The current framework, by contrast, would suggest that sellers more comprehensively attend to the different task stimuli. One way to test these two predictions would be to have buyers and sellers price lotteries that also include losses. If there is a general positivity bias, sellers should focus more on gains than losses, whereas a loss-attention account (Yechiam & Hochman, 2013a) would suggest that sellers should focus on both positive and negative amounts. Related predictions also emerge with respect to riskless choice. Recent work by Ashby, Walasek, and Glockner (2015) replicated the eye-tracking results of Ashby et al (2012) using consumer products and their reviews/ratings. In this setting, it would be expected that sellers spend more time fixating on relevant attributes to arrive at a more accurate predictions of value. This prediction is consistent with Johnson et al.'s (2007) finding on the reasons given by sellers and buyers for their chosen prices. In their study while sellers listed fewer value-decreasing aspects of the objects that affected their decision, they also listed a more balanced list of value-decreasing and value-increasing aspects (whereas buyers' list was biased towards value-decreasing aspects).

Finally, our findings suggest that through subtle changes in the framing of one's perspective in a trading negotiation, it is possible to improve the relative accuracy of pricing decisions. For instance, the ability of an antique trader to distinguish between objects of different value might be affected by whether one seeks to buy or sell them (even given the same knowledge level). Since the ability to differentiate and correctly sort objects by value is crucial in pricing (Akerlof, 1970) our findings suggest that even without an information asymmetry, sellers may have the upper hand in developing pricing strategies that better exploit actual value differences. Of course, so far we have only demonstrated this for lotteries; and it would be interesting to test this also in riskless settings, and with different instructions (see e.g., Engelmann & Hollard, 2010).

Appendix: EV sensitivity measured in terms of absolute deviations

We further examined whether sellers also showed higher EV sensitivity than buyers in an absolute sense. For this purpose, we examined differences in mean squared deviation (MSD) between the stated price and the expected value of each lottery for each individual participant, and the root of the mean squared deviation (RMSD) across participants. Note, however, that as opposed to our measure of relative accuracy, differences in RMSD are not independent of biases in the mean stated price, and thus are not formally independent of the endowment effect.

The mean RMSDs for sellers and buyers in the four studies are reported in Table 3. As can be seen, sellers showed lower disparity from the expected prices in all four studies. To statistically compare the selling and buying conditions, we conducted analyses as indicated above (e.g., in Study 1 the ANOVA included the information condition along with the buyer/seller perspective as within subject factors), with RMSD as the dependent measure instead of ρ. As shown in Table 3, in all four studies, the difference in RMSD between sellers and buyers was significant. Interestingly, the effect was evident in Study 4 as well, though it was smaller than in Study 1 and 3 (this is consistent with the reduced difference in relative accuracy found in this study). These results suggest that sellers exhibit higher EV sensitivity also when sensitivity is measured in terms of absolute deviations.

References

Akerlof, G.A. (1970). The market for lemons: Quality uncertainty and the market mechanism. *Quarterly Journal of Economics*, *84*, 488-500.

Allport, A., Styles, E., & Hsieh, S. (1994). Shining intentional set: Exploring the dynamic control of tasks. In C. Umilta & M. Moskovitch (Eds.), *Attention and performance XV* (pp. 421-452). Cambridge, MA: MIT Press.

Ashby, N.J.S., Dickert, S., & Glöckner, A. (2012). Focusing on what you own: Biased information uptake due to ownership. *Judgment and Decision Making*, *7*, 254-267.

Ashby, N.J.S., Walasek, L., & Glöckner, A. (2015). The effect of consumer ratings and attentional allocation on product valuations *Judgment and Decision Making*, *10*, 172-184.

Ayal, S., & Hochman, G. (2009). Ignorance or Integration: The Cognitive Processes Underlying Choice Behavior. *Journal of Behavioral Decision Making*, *22*, 455-474.

Baron, J. (2004). Cognitive biases, cognitive limits, and risk communication. *Journal of Public Policy and Marketing*, *23*, 7-13.

Bateman, I., Kahneman, D., Munro, A., Starmer, C., & Sugden, R. (2005). Testing competing models of loss aversion: an adversarial collaboration. *Journal of Public Economics*, *89*, 1561-1580.

Becker, G.M., DeGroot, M.H., & Marschak, J. (1964). Measuring utility by a single-response sequential method. *Behavioral Science*, *9*, 226-232.

Beggan, J.K. (1992). On the social nature of nonsocial perception: The mere ownership effect. *Journal of Personality and Social Psychology*, *62*, 229-237.

Bereby-Meyer, Y., & Erev, I. (1998). On learning to become a successful loser: A comparison of alternative abstractions of learning processes in the loss domain. *Journal of Mathematical Psychology*, *42*, 266-286.

Bettman, J.R., Johnson, E.J., & Payne, J.W. (1990). A componential analysis of cognitive effort in choice. *Organizational Behavior and Human Decision Processes*, *45*, 111-139.

Carmon, Z., & Ariely, D. (2000). Focusing on the forgone: How value can appear so different to buyers and sellers. *Journal of Consumer Research*, *27*, 360-370.

Casey, J.T. (1995). Predicting buyer-seller pricing disparities. *Management Science*, *41*, 979-999.

Chan, E., & Saqib, N.U. (2013). Loss aversion attenuates under time pressure. In S. Botti, & A. Labroo (Eds.), *NA - Advances in Consumer Research Volume 41* (pp. 426-427). Duluth, MN: Association for Consumer Research.

Coff, R.W. (1999). How buyers cope with uncertainty when acquiring firms in knowledge-intensive industries: Caveat emptor. *Organization Science*, *10*, 144-161.

Conover, J.N. (1986). The accuracy of price knowledge: issues in research methodology. In R.J. Lutz (Ed.), *Advances in Consumer Research, Vol. 13* (pp. 589-593). Provo, UT: Association for Consumer Research.

Engelmann, D., & Hollard, G. (2010). Reconsidering the effect of market experience on the "endowment effect". *Econometrica*, *78*, 2005-2019.

Fudenberg, D., Levine, K., & Maniadis, Z. (2012). On the robustness of anchoring effects in WTP and WTA experiments. *American Economic Journal*, *4*, 131-145.

Gal, D. (2006). A psychological law of inertia and the illusion of loss aversion. *Judgment and Decision Making*, *1*, 23-32.

Ganzach, Y. (1996). Preference reversals in equal-probability gambles: A case for anchoring and adjustment. *Journal of Behavioral Decision Making*, *9*, 95-109.

Gopher, D., Armony, L., & Greenshpan, Y. (2000). Switching tasks and attention policies. *Journal of Experimental Psychology: General*, *129*, 308-338.

Hausman, J. (2012). Contingent valuation: From dubious to hopeless. *The Journal of Economic Perspectives*, *26*, 43-56.

Horstmann, N., Ahlgrimm, A., & Glöckner, A. (2009). How distinct are intuition and deliberation? An eye-tracking analysis of instruction-induced decision modes. *Judgment and Decision Making*, *4*, 335-354.

Johnson, E.J., Häubl, G., & Keinan, A. (2007). Aspects of endowment: A query theory of value construction. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *33*, 461-474.

Johnson, J.G., & Busemeyer, J.R. (2005). A dynamic, computational model of preference reversal phenomena. *Psychological Review*, *112*, 841-861.

Kahneman, D. (1973). *Attention and effort*. Englewood Cliffs, NJ: Prentice-Hall.

Kahneman, D., & Frederick, S. (2002). Representativeness revisited: Attribute substitution in intuitive judgment. In T. Gilovich, D. Griffin, & D. Kahneman (Eds.), *Heuristics and biases* (pp. 49–81). New York: Cambridge University Press.

Kahneman, D., Knetsch, J.L., & Thaler, R.H. (1990). Experimental tests of the endowment effect and the Coase theorem. *Journal of Political Economy*, *98*, 1325-1348.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*, 263-291.

Kocher, M.G., Pahlke, J., & Trautmann, S.T. (2013). Tempus fugit: Time pressure in risky decisions. *Management Science*, 59, 2380-2391.

List, J.A. (2003). Does market experience eliminate market anomalies? *The Quarterly Journal of Economics*, *118*, 41-71.

Maddox, W.T., Baldwin, G.C., & Markman, A.B. (2006). A test of the regulatory fit hypothesis in perceptual classification learning. *Memory and Cognition*, *34*, 1377-1397.

Maniadis, Z., Tufano, F., & List, J.A. (2014). One swallow does not make a summer. *American Economic Review*, *104*, 277-290.

Morewedge, C.K., Shu, L.L., Gilbert, D.T., & Wilson, T.D. (2009). Bad riddance or good rubbish? Ownership and not loss aversion causes the endowment effect. *Journal of Experimental Social Psychology*, *45*, 947-971.

Norman, D.A., & Bobrow, D.G. (1975). On data-limited and resource-limited processes. *Cognitive Psychology*, *7*, 44-64.

Pachur, T., & Scheibehenne, B. (2012). Constructing preference from experience: The endowment effect reflected in external information search. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *38*, 1108-1116.

Peters, E., Slovic, P., & Gregory, R. (2003). The role of affect in WTA/WTP disparity. *Journal of Behavioral Decision Making*, *16*, 309-330.

Saguy, T., & Kteily, N. (2011). Inside the opponent's head: Perceived losses in group position predict accuracy in metaperceptions between groups. *Psychological Science, 22*, 951-958.

Sayman, S., & Oncular, A. (2005). Effects of study design characteristics on the WTA-WTP disparity: A meta analytical framework. *Journal of Economic Psychology*, *26*, 289-312.

Schurr, A., & Ritov, I. (2014). The effect of giving it all up on valuation: A new look at the endowment effect. *Management Science*, *60*, 628-637.

Shahrabani, S., & Benzion, U., & Shavit, T. (2008). Short-selling and the WTA-WTP gap. *Journal of Economics Letters*, *99*, 131-133.

Simonson, I., & Drolet, A. (2004). Anchoring effects on consumers' willingness-to-pay and willingness-to-accept. *Journal of Consumer Research*, *31*, 681-690.

Slovic, P., Griffin, D., & Tversky, A. (1990). Compatibility effects in judgment and choice. In R.M. Hogarth (Ed.), *Insights in decision making: A tribute to Hillel J. Einhorn* (pp. 5-27). Chicago, IL: University of Chicago.

Sugden, R., Zheng, J., & Zizzo, D.J. (2013). Not all anchors are created equal. *Journal of Economic Psychology*, *39*, 21-31.

Strayer, D.L., & Kramer, A.F. (1994). Strategies and automaticity II: Dynamic aspects of strategy adjustment. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *20*, 318-334.

Thaler, R. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior and Organization*, *1*, 39-60.

Trautmann, S.T., & Schmidt, U. (2014). Pricing risk and ambiguity: The effect of perspective taking. *The Quarterly Journal of Experimental Psychology*, *65*, 195-205.

Tufano, F. (2010). Are 'true' preferences revealed in repeated markets? An experimental demonstration of context-dependent valuations. *Experimental Economics 13*, 1-13.

Van Boven, L., Dunning, D., & Loewenstein, G. (2000). Egocentric empathy gaps between owners and buyers: Misperceptions of the endowment effect. *Journal of Personality and Social Psychology*, *79*, 66-76.

van Dijk, E., & van Knippenberg, D. (1996). Buying and selling exchange goods: Loss aversion and the endowment effect. *Journal of Economic Psychology*, *17*, 517-524.

van de Ven, N., Zeelenberg, M., & van Dijk, E. (2005). Buying and selling exchange goods: Outcome information, curiosity and the endowment effect. *Journal of Economic Psychology*, *26*, 459-468.

Weber, E.U., Shafir, S., & Blais, A.-R. (2004). Predicting risk sensitivity in humans and lower animals: Risk as variance or coefficient of variation. *Psychological Review*, *111*, 430-445.

Weaver, R., & Frederick, S. (2012). A reference price theory of the endowment effect. *Journal of Marketing Research*, *49*, 696-707.

Wieland, A., Sundali, J., Kemmelmeier, M., & Sarin, R. (2014). Gender differences in the endowment effect: Women pay less, but won't accept less. *Judgment and Decision Making*, *9*, 558-571.

Yechiam, E., & Hochman, G. (2013a). Losses as modulators of attention: Review and analysis of the unique effects of losses over gains. *Psychological Bulletin*, *139*, 497-518.

Yechiam E., & Hochman, G. (2013b). Loss-aversion or loss-attention: The impact of losses on cognitive performance. *Cognitive Psychology*, *66*, 212-231.

Yechiam, E., & Hochman, G. (2014). Loss attention in a dual task setting. *Psychological Science*, *25*, 494-502.

Yechiam, E., Zahavi, G., & Arditi, E. (2015). Loss restlessness and gain calmness: Durable effects of losses and gains on choice switching. *Psychonomic Bulletin and Review*, *22*, 1096-1103.

Table 1. The two sets of lotteries administered by Pachur and Scheibehenne (2012). The probability of winning is followed by the possible outcomes (O1 to O5), the lottery's expected value, and Willingness-to-Accept (WTA; as a seller) and Willingness-to-Pay (WTP; as a buyer) in the description and experience conditions. Top: Lottery Set *A* based on Ganzach (1996). Bottom: Lottery Set *B* based on Slovic et al. (1990).

								Description		Experience	
No	Prob	O1	O2	O3	O4	O5	EV	WTA	WTP	WTA	WTP
1	0.2	14	22	26	28	36	25.2	24.74	19.59	26.04	18.72
2	0.2	8	13	23	44	55	28.6	29.34	17.59	31.5	19.32
3	0.2	18	25	29	31	40	28.6	28.19	22.89	29.61	22.54
4	0.2	13	19	26	57	66	36.2	36.78	21.51	40.83	23.46
5	0.2	25	29	37	41	49	36.2	35.04	30.02	37.09	30.15
6	0.2	6	17	33	64	89	41.8	45.86	22.16	47.06	24.89
7	0.2	18	27	37	50	63	39.0	39.02	27.30	40.74	29.96
8	0.2	8	25	29	77	89	45.6	44.24	23.56	50.84	25.80
9	0.2	18	33	45	54	71	44.2	44.01	30.27	49.17	31.18
10	0.2	10	25	47	73	81	47.2	46.15	26.54	54.19	25.98
11	0.2	27	33	45	54	71	46.0	46.97	35.74	49.12	36.09
12	0.2	15	31	53	80	91	54.0	53.90	32.30	59.30	35.70
13	0.2	27	33	50	61	79	50.0	51.49	37.33	54.51	39.11
14	0.2	23	37	74	81	91	61.2	62.91	39.46	68.9	43.49
15	0.2	39	51	60	67	82	59.8	59.37	48.11	62.42	48.68
16	0.2	31	59	71	89	97	69.4	66.69	49.15	71.12	48.72
17	0.2	55	60	72	81	88	71.2	70.68	61.90	73.76	62.82

				Description		Experience	
No	Prob	O1	EV	WTA	WTP	WTA	WTP
1	35/36	4	3.89	3.34	2.38	3.45	2.39
2	11/36	16	4.89	7.52	3.35	7.6	3.37
3	29/36	2	1.61	1.45	0.96	1.44	0.84
4	7/36	9	1.75	3.38	1.47	3.99	1.36
5	34/36	3	2.83	2.40	1.71	2.5	1.58
6	18/36	6.5	3.25	3.76	2.15	3.92	1.60
7	32/36	4	3.56	3.09	2.06	3.17	2.06
8	4/36	40	4.44	12.95	4.16	11.89	3.37
9	34/36	2.5	2.36	1.88	1.32	2.17	1.33
10	14/36	8.5	3.31	4.15	2.17	4.59	2.08
11	33/36	2	1.83	1.57	1.13	1.56	1.02
12	16/36	5	2.22	2.93	1.56	2.99	1.20

Table 2. The lotteries administered by Ashby et al. (2013). The probability of winning is followed by the outcome (O), the lottery's expected value, and Willingness-to-Accept (WTA; as a seller) and Willingness-to-Pay (WTP; as a buyer), in three deliberation-time conditions.

				5 sec deliberation		10 sec deliberation		15 sec deliberation	
No	Prob	O	EV	WTA	WTP	WTA	WTP	WTA	WTP
1	0.5	8.67	4.34	3.71	3.13	3.73	2.80	4.24	3.01
2	0.5	17.33	8.66	7.34	5.70	7.45	5.20	7.36	5.55
3	0.5	26	13.00	9.94	8.31	10.72	7.35	10.45	8.06
4	0.5	34.67	17.33	12.64	9.40	12.92	8.89	13.05	10.11
5	0.25	8.67	2.17	2.91	2.37	2.56	1.82	2.93	1.72
6	0.25	17.33	4.33	4.88	3.86	4.72	3.15	5.07	3.27
7	0.25	26	6.50	6.71	4.27	5.86	3.99	6.77	4.12
8	0.25	34.67	8.67	8.08	5.70	7.34	4.30	7.69	5.11
9	0.75	8.67	6.50	4.76	4.10	4.71	3.91	4.70	3.80
10	0.75	17.33	13.00	9.66	7.69	9.52	6.87	9.63	6.70
11	0.75	26	19.50	12.26	9.83	13.12	9.20	14.43	10.05
12	0.75	34.67	26.00	16.71	12.85	17.07	11.73	17.74	12.27
13	0.05	8.67	0.43	1.51	1.13	1.60	0.85	1.99	0.79
14	0.05	17.33	0.87	2.51	1.71	2.49	1.38	3.19	1.51
15	0.05	26	1.30	3.57	2.25	3.65	1.79	3.42	1.68
16	0.05	34.67	1.73	4.25	2.45	3.99	2.01	3.80	2.01
17	0.95	8.67	8.24	6.38	4.85	6.42	5.19	6.07	5.18
18	0.95	17.33	16.46	12.00	9.52	12.38	8.93	12.09	9.33
19	0.95	26	24.70	16.30	12.59	17.53	13.00	18.31	13.45
20	0.95	34.67	32.94	20.82	15.93	23.00	16.76	22.80	16.57

Table 3: Disparity between the mean indicated price and the mean expected value in the four studies: Differences in Root Mean Square Deviation (RMSD) between the selling and buying conditions. A small value indicates a smaller disparity from the expected price. The significance tests reflect the results of ANOVAs conducted for each study (i.e., the main effect of perspective on RMSD).

Study	Sellers	Buyers	Difference
1	9.31**	12.60	3.29
2	7.58*	8.84	1.26
3	5.44**	12.53	7.09
4	8.83*	10.42	1.59

** = $p < .001$; * = $p < .01$

Figure 1. Study 1: Expected-value sensitivity (mean Spearman ρ) in the description and experience conditions and two lottery sets of Pachur and Scheibehenne (2012). Error terms denote standard errors.

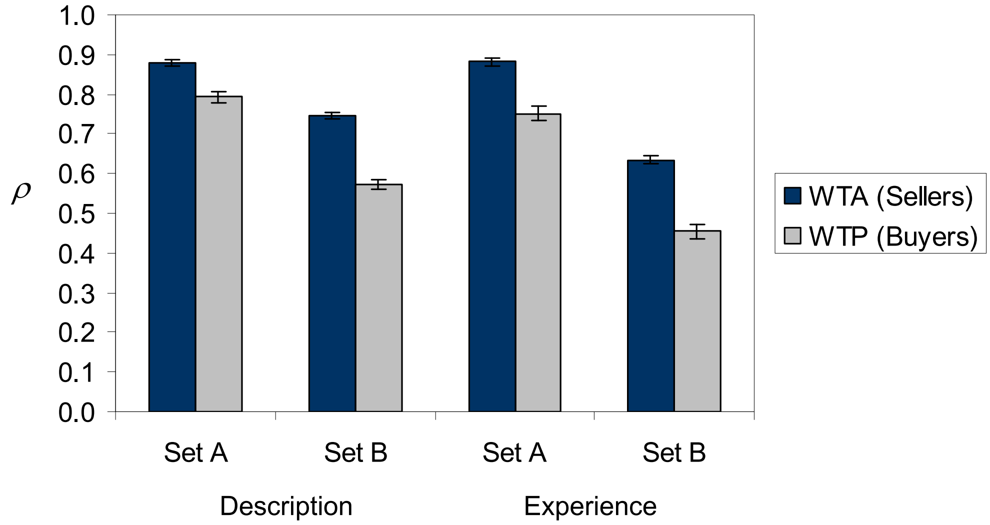

Figure 2. Study 2: Sensitivity to amount changes in Ashby et al. (2013). Expected-value sensitivity (mean Spearman ρ) and deliberation time condition. The findings are pooled across the five probability levels. Error terms denote standard errors.

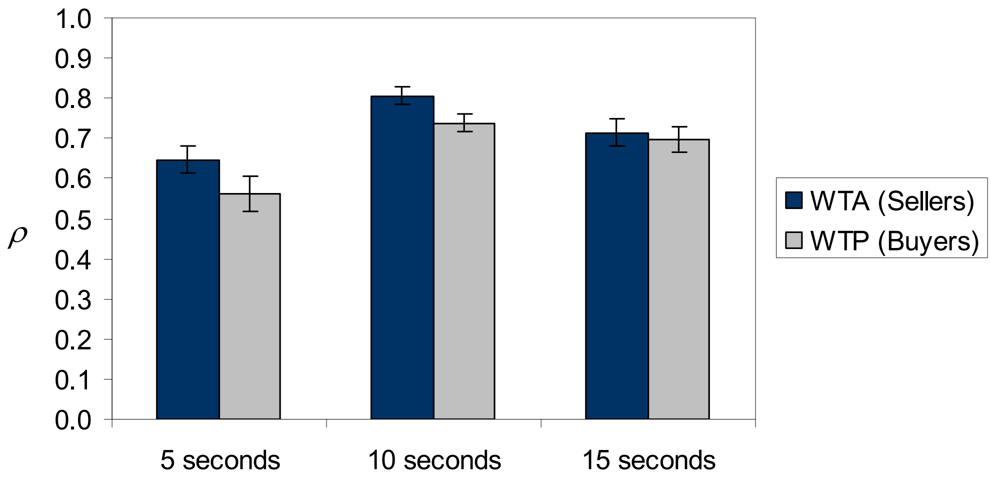

Figure 3. Study 2: Sensitivity to probability changes in Ashby et al. (2013). Expected-value sensitivity (mean Spearman ρ) in different deliberation times. The findings are pooled across the four monetary amounts. Error terms denote standard errors.

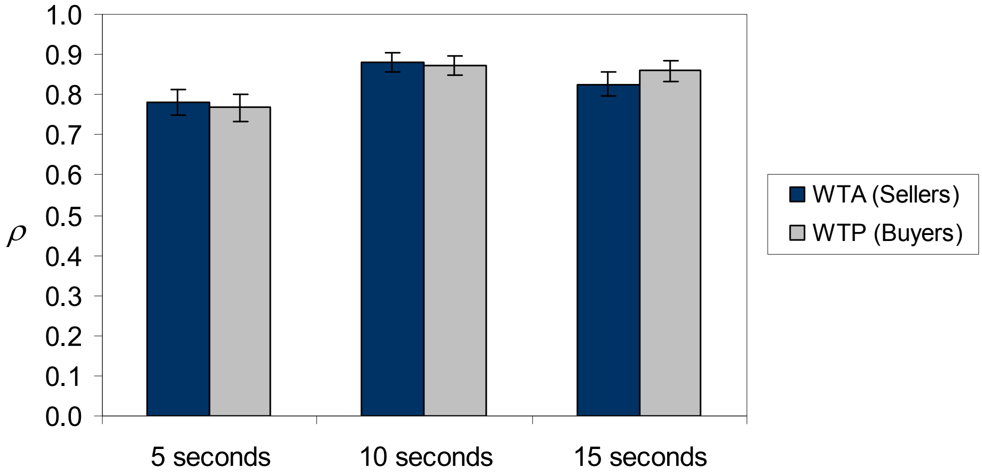

Figure 4: An illustration of the experimental task in Study 3 (Buyer condition). In this example the buyer pressed the "74.8" price and this highlighted all smaller prices as well. For the selling condition, prices higher than the price selected by the participant would be highlighted instead. The instructions were identical to those given by Pachur and Scheibehenne (2012).

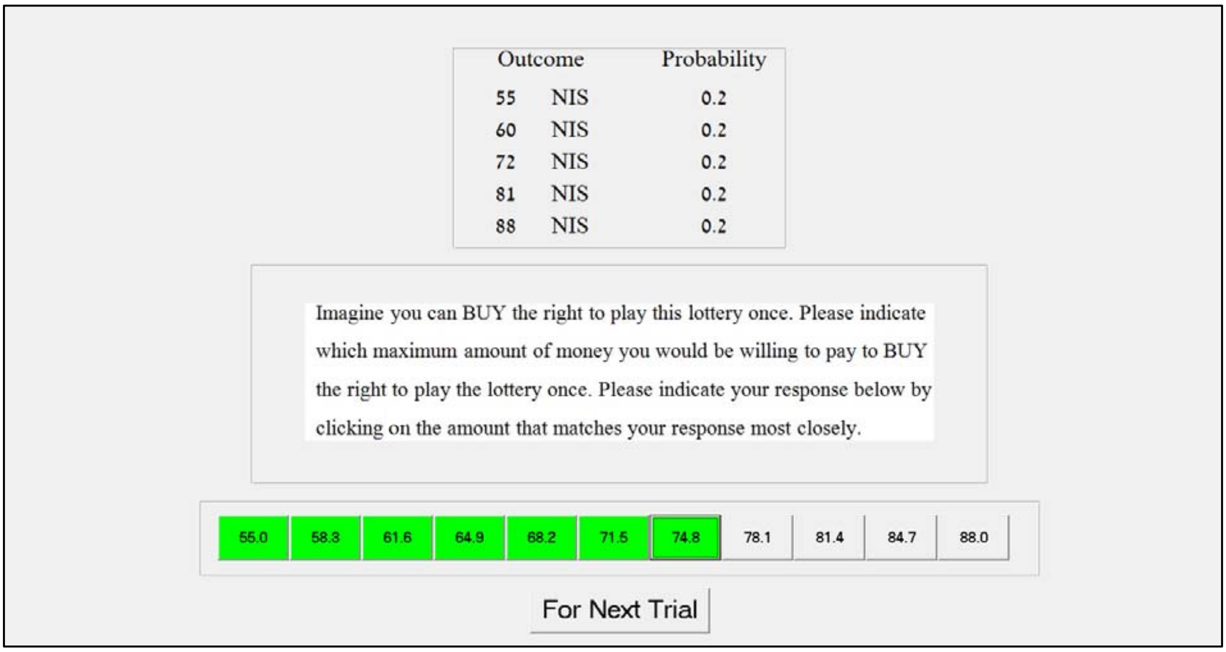

Figure 5: Results of Study 3. Left panel: Expected-value sensitivity (mean Spearman ρ). Middle Panel: Selling and buying prices (mean WTA and WTP) in New Israeli Shekel (₪). Right panel: Response times in seconds. The top and bottom panels correspond to the two lottery sets. Error terms denote standard errors.

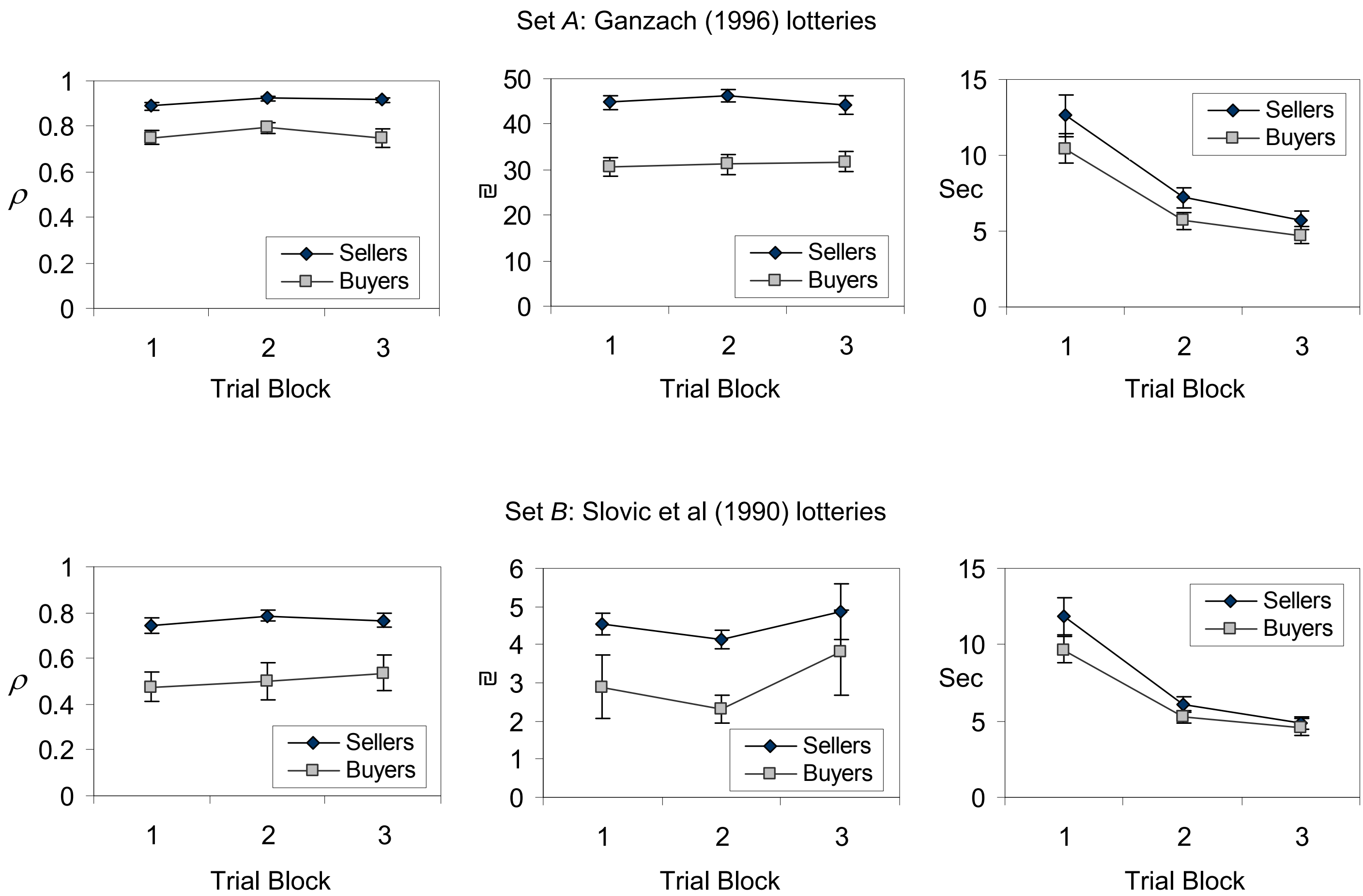

Figure 6: Results of Study 4 (mixed trials). Expected-value sensitivity (mean Spearman ρ), in each lottery set. Error terms denote standard errors.