Preference reversals resulting from a market value heuristic

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Abstract. Two studies demonstrated preference reversals using consumer products. Some subjects made a choice between a pair of food or hygiene products while others assigned minimum selling prices to each product. Product pairs were selected such that one item had a high market price but was undesirable (e.g. eggplant roulette) while the other item had a low market price but was desirable (e.g. a can of soda). As predicted, most subjects choose the low market price/desirable item, but the high market price/undesirable item was assigned a higher minimum selling price. Experiment 1 used a hypothetical questionnaire, while in Experiment 2 responses had real consequences. The results suggest a market value heuristic such that when decision makers are unsure of how to translate their preference into a specific dollar amount they substitute the product’s market price for their own preference. The implication of this heuristic is that if merchants consistently set the retail price of a particular product at a certain level, consumers will use that retail price as the basis of their pricing evaluations and will come to value the product at the retail price. Key Words choice market price preference reversal selling price

A decision maker’s preferences should not vary with the manner in which they are expressed, according to normative decision theory. For example, if a decision maker prefers an apple to a banana, she should choose the apple over the banana, and she should also pay more for an apple than for a banana and demand more
money in return for giving up the apple than she does for giving up the banana. That is, choice should yield the same preference order as buying or selling prices.

In contrast to normative theory, numerous decision-making studies have found that preferences do in fact vary with the manner of elicitation (e.g. Hsee, 1996; Irwin and Davis, 1995; Selart et al., 1999; Tversky and Thaler, 1990). Such preference reversals mean that a decision maker may, for example, choose A over B but also assign a higher selling price to B.

Preference reversal studies commonly use monetary lotteries. When evaluating one lottery with a large probability to win a modest amount and a second lottery with a small probability to win a large amount, decision makers tend to choose the first and assign a higher selling price to the latter. The leading account of this type of preference reversal is contingent weighting (Tversky et al., 1988). According to this theory, when decision makers set a selling price, they are highly influenced by the monetary payout of the lottery because both the payout and the selling price are expressed on a monetary scale. When making a choice, however, the probability to win is more influential.

In the current article, we demonstrate a new type of response mode preference reversal where the items of evaluation are consumer goods rather than monetary lotteries. These preference reversals have more obvious implications for marketing than those employing lotteries. Unlike lotteries, the consumer goods do not involve risk, and study participants are allowed to handle and examine the products as they would in a real shopping setting, thus minimizing uncertainty. In addition, the consumer products are not described on two explicit attributes (such as probability and amount to win), making contingent weighting a less likely explanation of the preference reversals. Instead, we propose that decision makers use a market value heuristic such that when they are unsure of how to translate their preference into a specific dollar amount, they substitute the product’s market price for their own preference. As a consequence, choices tend to reflect the decision maker’s own consumption preferences for the products, but minimum selling prices tend to reflect the market prices of the products. When the desirability of two products conflicts with their market prices, a preference reversal results. Such market value preference reversals were first demonstrated by Maxwell (1992) in an unpublished dissertation. In his study, most participants chose a can of soda over a jar of caviar but also assigned a higher minimum selling price to the caviar. Such results suggest that market prices have a large influence on consumer evaluation.

The market value heuristic can explain the strong influence of suggested retail price on consumer behavior, the attraction of sale items, and the perceived correlation between price and value. As discussed later, the biases resulting from use of the market value heuristic can be ameliorated by using choice rather than a pricing response mode.

The two studies reported here demonstrate market value preference reversals. In Experiment 1, participants made hypothetical choices and assigned hypothetical minimum selling prices. In Experiment 2, participants’ responses had real consequences.
Experiment 1

The purpose of Experiment 1 was to demonstrate market value preference reversals using a hypothetical questionnaire. Pairs of items were constructed such that one item had a low market price but was desirable while the other item had a high market price but was undesirable. Some subjects chose between the two items in each pair, while other subjects assigned minimum selling prices to each item. We predicted that the low market price/desirable item in each pair would be chosen but that the high market price/undesirable item would be given the higher selling price.

Method

Pilot study Fifty college students participated in a pilot study in which they rated the desirability of consumer products or estimated their market prices (the price they sold for in a store). Based on these responses, we constructed ten pairs of items such that one item within a pair was desirable and had a low market price (under $1.70) while the other item in the pair was undesirable and had a high market price ($2.79 – $5.00). Five pairs of items were food products and five pairs of items were hygiene products.

Subjects Thirty-eight college students participated in the experiment proper as part of a class requirement.

Materials Subjects evaluated the consumer products shown in Table 1. Half the products were food products and half were hygiene products. Within each product class, items were arranged into pairs such that a low market price/undesirable item was paired with a high market price/desirable item. A pilot study had determined that subjects did indeed perceive the low market price/desirable items to be less expensive and more desirable than the high market price/undesirable items. The items to be evaluated were placed in the center of the table around which subjects sat. Subjects were free to pick up and examine the products.

Procedure All subjects completed a paper-and-pencil questionnaire administered to small groups. Half the subjects (n = 19) made choices for each of the ten pairs, and the remaining subjects (n = 19) assigned minimum selling prices to each of the 20 items. Subjects were instructed that their minimum selling price was the lowest price for which they would sell the item – for any lower price they would prefer to keep the item. All subjects evaluated the food items first and the hygiene items second. Within each product category, each subject saw the pairs or individual items in one of two orders.
Table 1

Stimuli used in Experiment 1

<table>
<thead>
<tr>
<th>Product description</th>
<th>Low market price/Desirable items</th>
<th>High market price/Undesirable items</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actual market price $^a$</td>
<td>Mean minimum selling price $^a$</td>
</tr>
<tr>
<td><strong>Food Products</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smuckers Snackers</td>
<td>$0.99$</td>
<td>$2.05$</td>
</tr>
<tr>
<td>Snickers Candy Bar</td>
<td>$0.89$</td>
<td>$1.45$</td>
</tr>
<tr>
<td>Granola Bar</td>
<td>$0.50$</td>
<td>$1.16$</td>
</tr>
<tr>
<td>Winterfresh Gum</td>
<td>$0.79$</td>
<td>$1.19$</td>
</tr>
<tr>
<td>Ramen Instant Lunch</td>
<td>$0.45$</td>
<td>$1.50$</td>
</tr>
<tr>
<td><strong>Hygiene Products</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scope Mouthwash</td>
<td>$0.79$</td>
<td>$1.43$</td>
</tr>
<tr>
<td>Aleve Trial Size Caplets</td>
<td>$0.99$</td>
<td>$2.22$</td>
</tr>
<tr>
<td>Listerine Oral Care Strips</td>
<td>$1.69$</td>
<td>$1.69$</td>
</tr>
<tr>
<td>Crest Trial Size Toothpaste</td>
<td>$0.59$</td>
<td>$1.84$</td>
</tr>
<tr>
<td>Purell Hand Lotion</td>
<td>$0.69$</td>
<td>$1.63$</td>
</tr>
</tbody>
</table>

$^a$ Price paid by the experimenters at a local store.

$^b$ Percent choice for the low market price, desirable item.

$^c$ Percent of subjects giving a higher minimum selling price to the low market price, desirable item. Subjects who gave the same price to both items were removed from the denominator.

** $p < .0001$, *$p < .05$ by $\chi^2(1)$ comparison of the choice and selling preference percentages. n ranged from 33 to 38 depending on the number of tied selling prices.
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Results

The low market price/desirable items were chosen on average 79% of time over the paired high market price/undesirable items. This percentage differs significantly from 50 percent ($t(18) = 5.16, p < 0.0001$). The high market price/undesirable items, however, were assigned higher selling prices ($M = $2.88) than the low market price/desirable items ($M = $1.62, $t(18) = 7.00, p < 0.0001$). On average, the low market price/desirable items were priced higher than the high market price/undesirable item only 13 percent of the time, a percentage that is significantly smaller than 50 percent ($t(18) = 10.40, p < 0.0001$).

The selling prices for the two products comprising a pair were compared to determine a preference order for each pair and each subject. This implied preference order was compared to choice. If the same price was assigned to both products within a pair, the selling price preference order was considered missing. For each product pair we compared the percent of subjects who chose the low market price/desirable item to the percent of subjects who assigned a higher minimum selling price to that item. As shown in Table 1, the chi square comparison showed a significant difference for each of the ten product pairs.

As an omnibus analysis, for each subject we computed the average number (out of ten) of pairs in which the low market price/desirable product was preferred for each response mode and each product category. These averages were subjected to a 2 (response mode: choice vs. selling) x 2 (product category: food vs. hygiene) ANOVA. Product category was a within-subject variable, and response mode was a between-subjects variable. The main effect of response mode was significant ($F(1,34) = 88.16, MSE = 0.09, p < 0.0001$), indicating that the low market value/desirable products were preferred more frequently in choice than selling. Neither the main effect of product category ($F(1,34) = 2.25, MSE = 0.02, p = 0.14$) nor the interaction was significant ($F(1,34) = 0.12, MSE=0.02, p = 0.73$). Thus, the strength of the preference reversal effect did not differ significantly between product categories.

Discussion

As predicted, we found an effect of response mode such that the low market price/desirable item was chosen but the high market price/undesirable item was given the higher selling price. This finding replicates Maxwell’s (1992) study. In the current study, results were similar for the food and hygiene product categories.

A limitation of Experiment 1 was the use of a hypothetical questionnaire. Although subjects were given explicit instructions on the meaning of minimum selling price, they may not have thought carefully about what price would reflect their own preferences. If the minimum selling price that they stated determined whether they kept the item or received a sum of cash instead, they might think more carefully about their minimum selling prices and assign prices more in line with their choices. Consequently, Experiment 2 used choices and selling prices with real consequences.
Experiment 2

The purpose of Experiment 2 was to demonstrate response mode preference reversals when responses had real consequences. Two product pairs were used – one in the food domain (soda and eggplant roulettes) and one in the hygiene domain (mouth wash and cod liver oil). Each subject made a choice in one domain and assigned selling prices in the other domain. For each subject, either the choice or one selling price was enacted for real, and subjects received the preferred product or an amount of money, as described below.

Method

Subjects  Forty college students participated as part of a class requirement.

Materials  The food product pair consisted of a 7.5 ounce jar of stuffed eggplant roulettes and a cold 12 ounce can of Coke. (All subjects were shown a can of Coke but were told they could have a can of Diet Coke or Sprite instead if they preferred.) The hygiene product pair consisted of a 0.5 ounce bottle of Scope brand mouthwash and a jar of 100 cod liver oil caplets. The experiment also employed a bag of red and blue poker chips with offer prices taped to the chips. The prices on the chips ranged from $0.25 to $10.00 in $0.25 increments. The distribution of prices was skewed such that lower prices were more frequent than higher prices. The same distribution was used for the red and blue chips.

Procedure  Subjects were randomly assigned to one of two groups. One group (n = 20) made choices between food products and assigned selling prices to hygiene products, and the other group (n = 20) made choices between hygiene products and assigned selling prices to food products. No subject was asked both to make a choice and assign selling prices for the same pair of items in order to avoid a perceived demand that choices and prices be consistent.

Subjects were individually tested sitting at a table. The experimenter read the instructions which outlined the experiment, stressing that one of the subject's responses would be played for real. Subjects were presented with a practice version of the experiment using two sample product pairs unrelated to the experimental stimuli (Hi-Bounce Ball and Magic 8 ball; pen and Post-It notes). For the practice round, the subject was asked to choose between one pair of products and then to set minimum selling prices for the products in the other practice pair. The experimenter then explained how one response would be played for real. A fair coin was flipped. A result of heads meant that the choice response would be enacted for real, meaning that the subject would keep the item that they chose. A result of tails on the coin meant that a selling price response would have real consequences. The subject would draw a poker chip from the bag. The color of the chip (red or blue) would indicate which product the subject had the opportunity to sell. (The products in each pair were color coded with a red or blue chip.) The price printed on the chip indicated the offer price. The offer price would be com-
pared to the subject's minimum selling price. If the offer were greater than or equal to the subject's minimum selling price, the subject would sell the item to the experimenter and the subject would be given the offer price in cash. If the offer price on the chip were smaller than the subject's price, the subject would keep the item. In the practice round, the subject was allowed to draw a chip out of the bag, and the results were determined. At the completion of the practice round, the actual experiment was run, following the same procedure as the practice round.

Results

The mean (sd) selling prices responses (based on an n of 20) were as follows: eggplant $1.68 (1.21), soda $0.84 (0.38), mouthwash $1.60 (1.05), cod liver oil $2.91 (1.80). The selling prices of the two items in a pair differed significantly in both the food (t(19) = 3.23, p = 0.004) and the hygiene product classes (t(19) = 2.88, p = 0.01).

Each subject's selling prices for the two items within a pair were compared to determine the implied preference order. Four subjects gave the same price to the two items in a pair (two who priced food products and two who priced hygiene products). In these cases, we assigned a preference order opposite to prediction (i.e. a preference for the low market price/desirable item). The preference order implied by selling prices was compared to choice. As shown in Table 2, when evaluating the food products, 95 percent of the 20 subjects making choices chose the soda over the eggplant. When assigning selling prices, however, only 35 percent of the other 20 subjects assigned a higher selling price to the soda. These two percentages differ significantly ($\chi^2(1, N = 40) = 15.82, p < 0.0001$), indicating an

<table>
<thead>
<tr>
<th>Product category and response mode</th>
<th>High market value/Undesirable product</th>
<th>Low market value/Desirable product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food category</td>
<td>Eggplant</td>
<td>Soda</td>
</tr>
<tr>
<td>Choice (n=20)</td>
<td>5%</td>
<td>95%</td>
</tr>
<tr>
<td>Selling (n=20)</td>
<td>65%</td>
<td>35%</td>
</tr>
<tr>
<td>Hygiene category</td>
<td>Cod Liver Oil</td>
<td>Mouthwash</td>
</tr>
<tr>
<td>Choice (n=20)</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>Selling (n=20)</td>
<td>70%</td>
<td>30%</td>
</tr>
</tbody>
</table>

Note: the participants who provided choice responses for the food category also provided selling responses for the hygiene category. Likewise, those who provided selling responses for the food category provided choice responses for the hygiene category.
effect of response mode. Similarly, when evaluating the hygiene products, 80 percent of subjects chose the mouthwash over the cod liver oil, but when assigning prices, only 30 percent gave a higher price to the mouthwash ($\chi^2(1, N = 40) = 10.10, p = 0.002$).

A 2 (response mode: choice vs. selling price) × 2 (product category: food vs. hygiene) logistic regression used the dichotomous dependent variable of preference order (choosing or giving a higher price to the low market value/desirable or high market value/undesirable product). Both independent variables were within-subject, but their interaction was between subjects. The main effect of response mode was significant ($\chi^2(1, N = 40) = 15.50, p < 0.0001$), indicating preference reversals such that the low market value/desirable products were preferred more frequently in choice than selling. Neither the main effect of product category ($\chi^2(1, N = 40) = 0.16, p = 0.69$) nor the interaction was significant ($\chi^2(1, N = 40) = 0.31, p = 0.58$). Thus, the strength of the preference reversal effect did not differ significantly between product categories.

**Discussion**

Experiment 2 revealed a response mode preference reversal effect like that found in Experiment 1. Even when subjects' choices and selling prices had real consequences, they tended to choose the desirable item and give a higher price to the high market price item. As in Experiment 1, there did not seem to be any differences in the strength of the response mode effects between the two product categories. Maxwell (1992) found similar results.

**General discussion**

In the two studies presented here, decision makers chose one item from a pair but assigned a higher minimum selling price to the other item. The item most frequently chosen in each pair was one that had received a high desirability rating in a pilot study. In contrast, the item most frequently assigned the higher selling price was estimated to have a high market price in a pilot study. This conflict between desirability and market price resulted in preference reversals. When faced with a choice, decision makers appeared to base their selection on the relative desirability of consuming each item. For example, if a college student would rather drink a soda than eat eggplant rolettes, she would choose the former. When asked to assign minimum selling prices, however, decision makers appeared to refer to the market price of the items. Thus, if a jar of eggplant rolettes costs more than a can of soda in a grocery store, decision makers tend to assign a higher minimum selling price to the former. It appears that decision makers sometimes confuse their own consumption preferences with market value. Although it may be easy for a decision maker to establish that she does not like eating eggplant rolettes very much, it is likely much more difficult to translate that preference into a specific dollar amount. Faced with such a difficult task, decision makers may resort to an
effort-saving heuristic. If the market price of the product can be easily estimated, that price can be used as a basis for the minimum selling price. This market-value heuristic results in selling prices that correspond more to market prices than to the decision maker’s consumption preferences and therefore conflict with choice.

The current results replicate previous finding by Maxwell (1992), who offered a similar explanation. Maxwell argued that decision makers ‘edit out’ selling prices that violate certain constraints. For example, they will not report a minimum selling price that is negative, even if that price accurately reflects their preference (e.g. someone who hates eggplant roulettes so much that she would pay the experimenter to take them away would nevertheless report a positive selling price). In addition, decision makers will not report selling prices that exceed the market price, even if such a selling price accurately reflects their preference (e.g. someone who loves soda so much she would pay $5 per can if need be would nevertheless report a selling price of under $1).

The reliance on market prices when setting minimum selling prices may result from considerations of fairness. Kahneman et al. (1986) found that market prices often serve as reference points that guide intuitions about fairness. Participants in the current study might have thought it unfair if they received less than the market price in exchange for an item, even if they had no consumption utility for the item. In contrast, it would not seem unfair for a subject to receive a chosen item that had a lower market price than the alternative item.

Another possible route for the influence of market prices is consideration of regret. Decision makers may have anticipated the regret they would feel if they sold an item (say, the eggplant roulettes) for below market price in the experiment but then later had a need to purchase that same item and were required to pay market price. Such regret would likely not occur if the decision maker chose the soda over the eggplant but then later had a need to purchase a jar of eggplant roulettes at market price. That is, anticipated regret likely influences selling prices more than choice. Evaluation of these accounts awaits further research.

Marketing implications

In many marketing situations, consumers use a pricing response mode. Although consumers sometimes make choices between products (e.g. ‘Should I spend my birthday money on some new shoes or a new computer game?’), more commonly they evaluate a price (e.g. ‘Is this bicycle worth $500 to me?’). When consumers are asked to express their preference for a product in terms of a price, the market value heuristic can influence evaluation. The market value heuristic suggests that if merchants consistently set the retail price of a particular product at a certain level, consumers will use that retail price as the basis of their pricing evaluations. That is, when using a price response mode, consumers will come to value the product at the retail price.

The market value heuristic will influence pricing judgments only when decision makers can refer to a market value price. Thus, it should be particularly influential for well-established products with well-known retail prices. The market value
heuristic can also influence evaluation of less well-known products if the merchant provides a market value price, such as the manufacturer’s suggested retail price (MSRP).

Thus, the MSRP should have a powerful effect on consumer behavior. Consumers use the MSRP as a reference point to which subsequent fluctuations in price are compared. Sales, two-for-one offers, and other marketing strategies capitalize on this reference point. If, for instance, a decision maker sees that a pair of jeans has been marked down from $100 to $50 he might be more willing to spend the $50 than if the jeans initially had been offered at that price. The consumer bases his initial valuation of the jeans on the retail price, and consequently the sale price appears to be a savings of $50. Rather than viewing the sale price as a loss of $50, the consumer views it as a gain relative to the suggested price of $100. Retail stores may consequently inflate the suggested retail prices of their goods but offer them at ‘sale’ prices in an attempt to make customers feel like they are saving money. Reference points such as the suggested retail price are not needed in choice, because the decision maker can compare the products in the choice set directly to one another.

The perceived correlation between price and value (e.g. Ordóñez, 1998) can also be explained via the market value heuristic. Consumers often assume that more expensive products are of a higher quality than their less expensive counterparts. That is, price is used as a stand-in for quality when quality cannot be directly assessed. The current results suggest that consumers will evaluate expensive products positively even when the product is not desirable or useful to the consumer.

The market value heuristic can affect decision makers not only when making purchases, but also when they are selling items. People may be tempted to set their reserve prices close to the suggested retail price of an item with too little regard for what the value of that item is on the open market. As a result, people may spend too long selling cars or houses or be left with too many unwanted but unsold items at the end of a yard sale.

Sometimes there is more than one market value to which to refer. For example, when selling a house, the homeowner might set her asking price using either the original purchase price (perhaps adjusted for renovations and inflation) or the current selling prices of other similar houses in the neighborhood. If the homeowner bases the asking price on her original purchase price, and if the real estate market has fallen, the homeowner might value her house at a price for which she cannot realistically expect to sell. As a consequence, the homeowner might choose not to sell her house.

The market value heuristic suggests not only how market values might bias consumer behavior but also a method for consumers to escape the influence of suggested retail prices. The market value heuristic operates only in a pricing response mode when decision makers are unsure of how to translate their preferences onto a dollar scale. If the consumer poses a choice for himself, the retail price will have less influence. For example, rather than asking himself whether he would pay $50 for the pair of jeans, the consumer could ask himself whether he would
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rather have the jeans or something else that can be bought for $50 (say, dinner for two at an inexpensive restaurant). As another example, our homeowner might ask herself whether she would rather live in her current house or in an alternate house that could be bought with the money she could realistically receive from the sale of her current house.

Limitations

Although the current studies have important implications, they also have some limitations. Response mode was a between-subjects variable such that no subject made a choice and assigned selling prices for the same pair of items. Thus, no individual subject demonstrated a preference reversal. Consequently, the current studies do not provide as definitive support for a preference reversal bias as would a within-subject study. Response mode was kept as a between-subjects factor to avoid a perceived demand to give consistent responses. In addition, the current studies, like most preference reversal studies, do not indicate which response mode is a better indicator of subjects’ true preferences. The market value heuristic we propose suggests that the choice response mode is a better reflection of the decision makers’ true preferences than is the selling price response mode. The current studies, however, do not provide a gold standard of true preferences or indicate definitively which response mode better reflects such true preferences. Finally, the current studies compared choice to selling price, not buying price, even though more consumer evaluations involve buying than selling prices. Selling prices were used in the current studies for a particular design reason – namely that market values provide a natural cap to buying prices, but not to selling prices, and this cap could have produced spurious preference reversals in the experiments.1 Nevertheless, the current studies leave open the question of whether market value influences buying prices as strongly as it influences selling prices.

Conclusion

Response mode influences decision makers’ evaluations of consumer products. When consumption preferences are at odds with market prices, preference reversals can result between choice and selling prices. The current results cannot be easily explained by current leading accounts of response mode preference reversals, and they point to the important role that market prices play in guiding consumer preferences and behavior.

Note

1 For example, even if someone has a very strong preference for soda, she would not pay more than $0.80 for a can of soda in an experiment if she knows that right after the experiment she can take her $0.80 to the soda machine upstairs and buy a can.
References


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